GE Digital

GE Digital APM Data Loaders

V4.3.0.4.0

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About This Document

This file is provided so that you can easily print this section of the GE Digital APM Help system.

You should, however, use the Help system instead of a printed document. This is because the Help system provides hyperlinks that will assist you in easily locating the related instructions that you need. Such links are not available in a print document format.

The GE Digital APM Help system can be accessed within GE Digital APM itself or via the GE Digital APM Documentation Website (https://www.meridium.com/secure/documentation/WebHelp/Home.htm).

Note: If you do not have access to the GE Digital APM Documentation Website, contact GE Global Support (https://www.ge.com/digital/asset-performance-management).

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Overview of Data Loaders

Data Loaders provide users with the ability to import data from external sources into the various GE Digital APM modules. For example, if a user needs to migrate Thickness Monitoring data from a point solution, a data loader could be used to accomplish this data integration.

All of the data loaders share common capabilities and architecture. Each one uses an Excel workbook as the source of data to be loaded into GE Digital APM, and each contains the intelligence to load the specific data model for which it was intended. The data is imported using GE Digital's web services.

More Details

The following data loaders are available:

- APM Connect Data Loaders
  - APM Family Data Loader
  - Equipment and Functional Location Data Loader
  - Tags to Assets Relationship Data Loader
  - Taxonomy Data Loader
  - Work History Data Loader
- APM Failure Elimination Data Loaders
  - Production Loss Analysis (PLA) 1-Admin Data Loader
  - Production Loss Analysis (PLA) 3-Plan Data Loader
  - Production Loss Analysis (PLA) 2-Event Data Loader
  - Root Cause Analysis (RCA) Data Loader
- APM Foundation Data Loaders
  - Asset Criticality Analysis (ACA) Data Loader
  - Custom Asset Hierarchy Data Loader
  - Geographic Information Systems (GIS) Data Loader
  - Role Data Loader
- APM Health Data Loaders
  - Rounds Allowable Values Data Loader
  - Rounds Templates Data Loader
  - Rounds Routes Data Loader
  - Rounds Readings Data Loader

- APM Mechanical Integrity Data Loaders
  - Inspection Management (IM) Assets Data Loader
  - Inspection Management (IM) Functional Location Data Loader
  - Risk Based Inspection (RBI) 580 Data Loader
  - Risk Based Inspection (RBI) 581 Data Loader
  - Risk Based Inspection (RBI) Corrosion Loop Data Loader
  - Thickness Monitoring (TM) Equipment Data Loader
  - Thickness Monitoring (TM) Functional Location Data Loader
- APM Power Generation Data Loaders
  - Generation Availability Analysis (GAA) Amplification Codes Data Loader
  - Generation Availability Analysis (GAA) Cause Codes Data Loader
- APM Safety Data Loaders
  - Calibration Data Loader
  - HAZOP Analysis Data Loader
- APM Strategy Data Loaders
  - Asset Strategy Management (ASM) Data Loaders
  - Failure Modes and Effects Analysis (FMEA) Data Loader
  - Reliability Centered Maintenance (RCM) Data Loader

Data Loaders Workflow

This workflow provides the basic, high-level steps for using this module. The steps and links in this workflow do not necessarily reference every possible procedure. For more procedures, see the links in the Related Information section.

1. Identify the data you want to transfer from external sources to GE Digital APM.
2. Download the Data Loader Workbooks, and then populate the data loader workbooks.
3. Optionally, test the connections required to complete a data load.
4. In GE Digital APM, select the appropriate data loader workbook, and then run a data import job.
5. Review the Data Import Log for warnings, messages, or errors.
6. If there are transfer errors, resolve the errors.

Manage Data Loaders

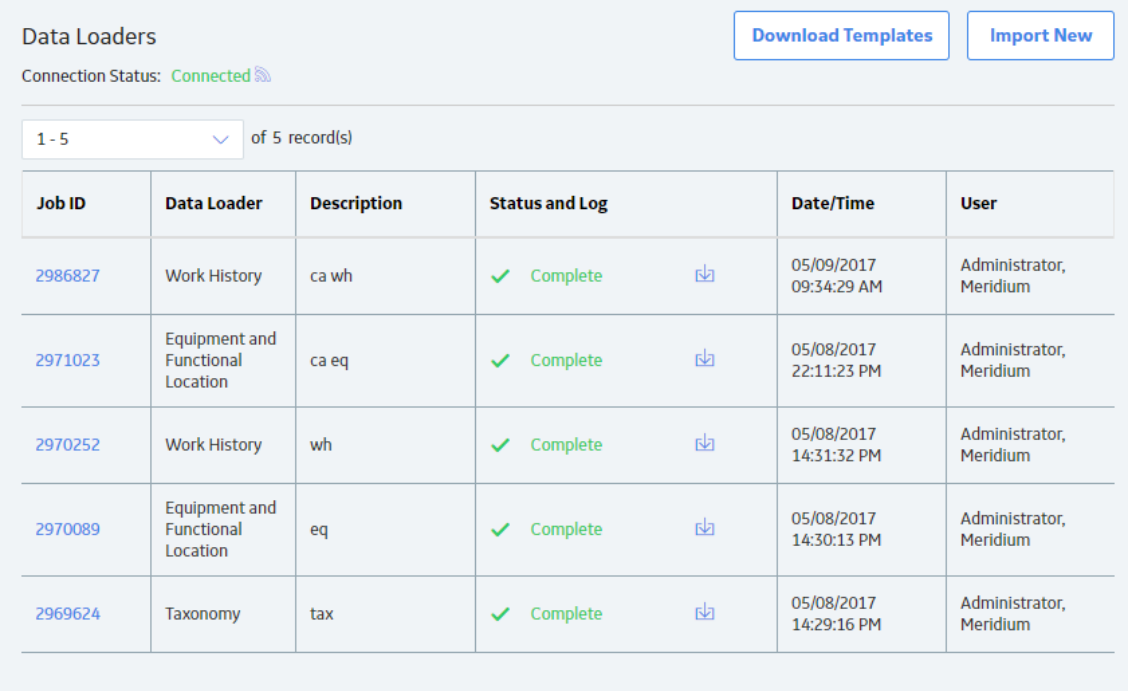
This topic provides a list of all procedures related to data loaders, as well as links to the related concept and reference topics.

Access the Data Loaders Page

Steps

1. On the left navigation menu, select **Tools**, and then select **Data Loaders**.

   The **Data Loaders** page appears.

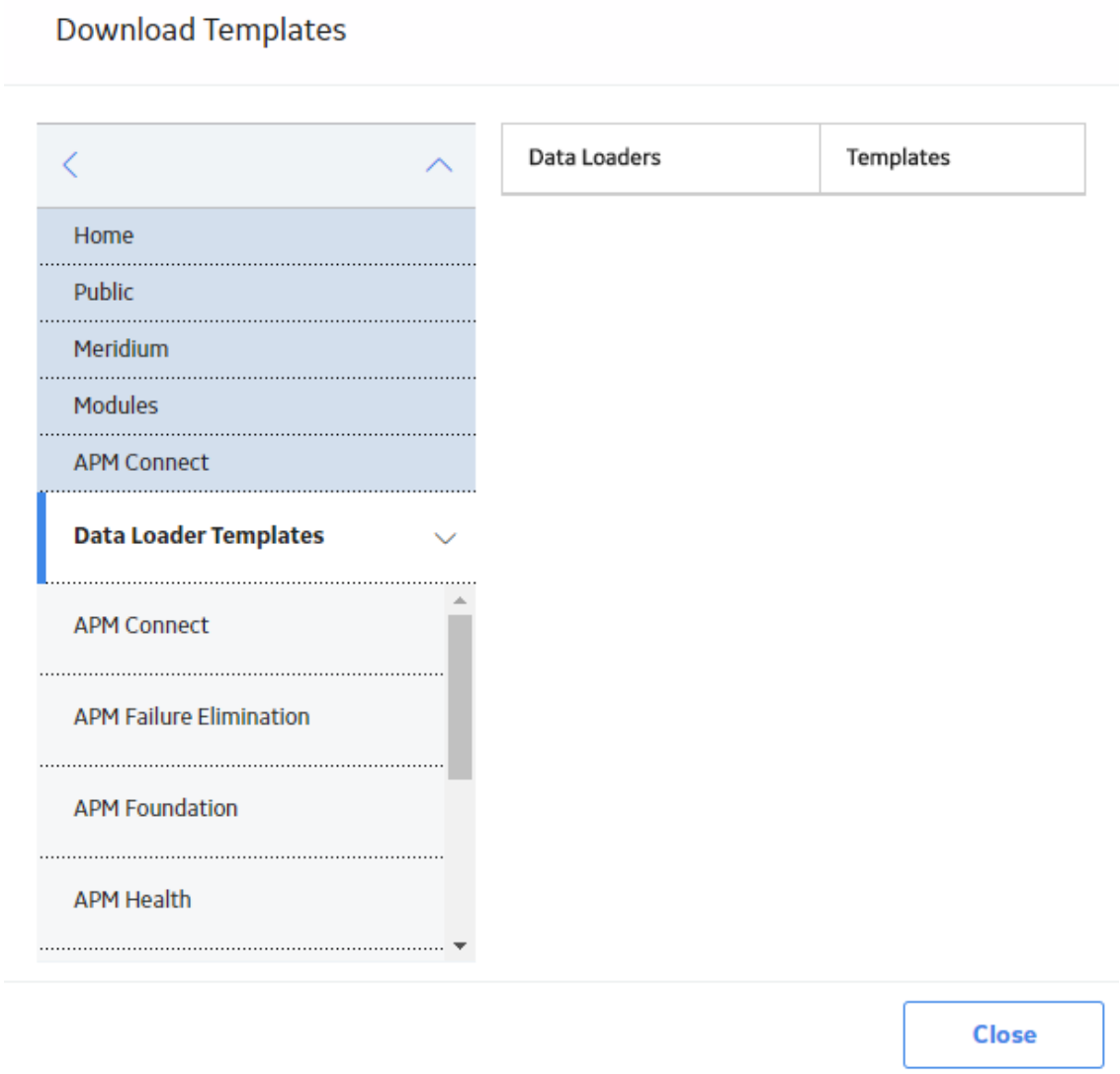


Download the Data Loader Workbooks

Steps

1. Access the **Data Loaders** page, and then select **Download Templates**.

   The **Download Templates** window appears, displaying a list of the data loader categories.



2. Select the category whose template you want to download.

Data Loader Category	Workbooks in the Category
APM Connect	APM Family , Equipment and Functional Location, Tag to Asset Relationship, Taxonomy, Work History
APM Failure Elimination	Production Loss Analysis (PLA) , Root Cause Analysis (RCA)
APM Foundation	Asset Criticality Analysis (ACA), Geographic Information System (GIS), Custom Asset HierarchyCustom Asset Hierarchy, Role
APM Health	Rounds Allowable Values , Rounds Readings, Rounds Routes, Rounds Templates
APM Mechanical Integrity	Inspection Management (IM) Assets, Inspection Management (IM) Functional Location, Risk Based Inspection (RBI) 580, Risk Based Inspection (RBI) 581, Risk Based Inspection (RBI) Corrosion Loop, Thickness Monitoring (TM) Equipment, Thickness Monitoring (TM) Functional Location
APM Power Generation	Generation Availability Analysis (GAA) Amplification Codes, Generation Availability Analysis (GAA) Cause Codes
APM Safety	Calibration, Hazards
APM Strategy	Asset Strategy Management (ASM), Asset Strategy Management (ASM) Templates, Failure Modes and Effects Analysis (FMEA), FMEA Analysis Template, FMEA Asset Template, Reliability Centered Maintainence (RCM)

3. In the **Templates** column, in the row for the data loader whose template you want to download, select .

   The template is downloaded, and can be populated with data to load into GE Digital APM.

Access Localized Data Loader Workbooks

The localized Data Loader workbooks are delivered on the GE Digital APM server.

Steps

1. On your GE Digital APM server, navigate to the folder where the localized workbooks are stored. If you installed GE Digital APM in the default location, navigate to C:\Program Files\Meridium\Templates\DataLoaders.

   The DataLoaders folder appears.

2. Within the DataLoaders folder, navigate to the folder containing the workbook in the language you want according to the following table:

Folder	Language
de	German
Default	English
es	Spanish
fr	French
it	Italian
ja	Japanese
nl	Dutch
pt-BR	Portuguese (Brazilian)
ru	Russian
zh-CHS	Chinese (Simplified)

Results

- The localized workbooks are accessed, and can be used to load data into GE Digital APM. Optionally, you can import the localized workbooks into GE Digital APM, so that they can be accessed from the **Data Loaders** page.

Import Data Loader Workbooks

You can import custom Data Loader workbooks or localized workbooks into GE Digital APM, so that they can be accessed on the **Data Loaders** page.

Steps

1. Access the **Export** page.
2. In the **Available Items** section, in the **Select metadata type** drop-down, select **DataLoader Templates**.

   The **Available Items** section is populated with the Data Loader catalog entries.
3. Select the box of Data Loader whose workbook you want to modify, and then select .

   The Data Loader appears in the **Selected Items** section.
4. In the **File Name** box, enter a name for the file that will be exported, and then select the **File Type** XML(.xml).
5. Select **Start Export**.

   The Data Loader files are exported, and a zip file is downloaded containing three files:

   - **<Data Loader Name> Files**: A folder containing the excel source workbook for that data loader.
   - **<DataLoaderName>.xml**: An xml containing the metadata for the data loader catalog item.
   - **ExportLog**: A log file detailing the export from GE Digital APM.
6. Open the **<DataLoder Name> Files** folder, and place a copy of the workbook to be imported into the folder.
7. If you want to replace the default workbook with the workbook to be imported, rename the workbook to be imported to match the exact naming structure of the default template, and then delete the default template.

   ⚠**IMPORTANT:** The name of the file to be imported must match the original file name exactly. Otherwise, the workbook will be not be available to download in GE Digital APM
8. If you want to add an additional workbook, and keep the default workbook:

   a. Ensure the workbook to be imported has a unique name, different from the naming structure of the default workbook, and then delete the default workbook.

b. Open the **<DataLoaderName>.xml** file.

c. In the **DATALOADERTEMPLATE_ID**, **DATALOADERTEMPLATE_DESC,** and the **DATALOADERTEMPLATE_FILE_NM** parameters, replace the existing value with the name of the new workbook to be imported.

d. Save the file.

9. Create a zip file with the **<Data Loader Name> Files** folder containing the new workbook to be imported, the **<DataLoaderName>.xml** file, and the **ExportLog** file.
10. Access the **Import** page.
11. In the **Import File** box, select **Choose File**, and then navigate to the zip file you created in the previous step.
12. Select the box of Data Loader whose workbook you want to import, and then select  .
13. Select **Start Import**.

    The new workbook is imported into GE Digital APM.

Results

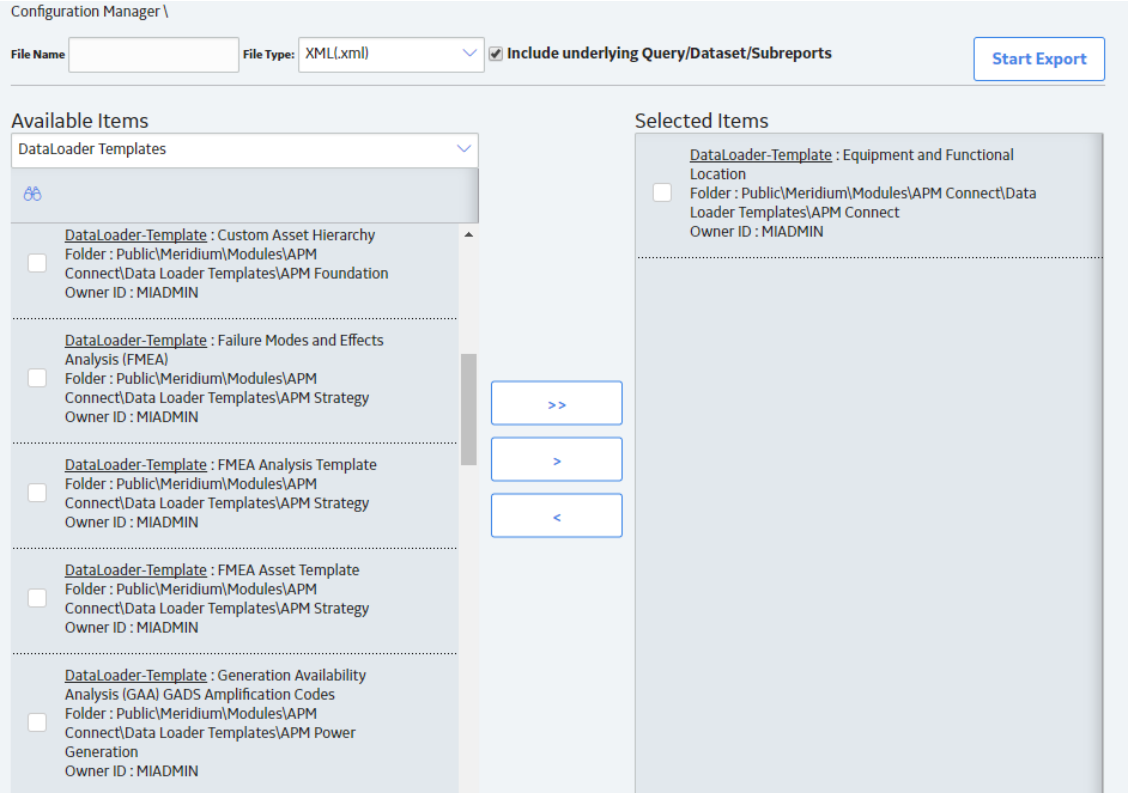
- The workbook that you imported can be download on the Data Loaders page.

Example: Import an Additional Equipment and Functional Location Workbook

1. Access the **Export** page,
2. In the **Available Items** section, in the **Select metadata type** drop-down, select **DataLoaders Template**.

   The **Available Items** section is populated with the Data Loader catalog entries.
3. Select the **Equipment and Functional Location** box, and then select  .

   The Equipment and Functional Location Data Loader appears in the **Selected Items** section.



4. In the **File Name** box, enter *Equipment and Functional Location Export*, and then select the **File Type** XML(.xml).
5. Select **Start Export**.

   The Data Loader workbook files are exported, and a zip file is downloaded containing three files:

   - **Equipment and Functional Location Export Files**: A folder containing the default Equipment and Functional Location Data Loader workbook.
   - **Equipment and Functional Location Export.xml**: An .xml containing the metadata for the catalog item.
   - **ExportLog**: A log file detailing the export from GE Digital APM.
6. Open the **Equipment and Functional Location Export Files** folder, and place a copy of the workbook to be imported into the folder. In this example the workbook name is Equipment and Functional Location_DE.
7. Ensure the template to be imported has a unique name different from the naming structure of the default template, and then delete the default template.

8. Open the **Equipment and Functional Location Export.xml** file.
9. In the **DATALOADERTEMPLATE_ID** and **DATALOADERTEMPLATE_DESC**parameters, replace Equipment and Functional Location with Equipment and Functional Location_DE.
10. In the parameter **DATALOADERTEMPLATE_FILE_NM,** replace the value with Equipment and Functional Location_DE.xml.
11. Save the file.
12. Create a zip file with the *Equipment and Functional Location Export* files.
13. Access the **Import** page.
14. In the **Import File** box, select **Choose File**, and then navigate to the zip file *Equipment and Functional Location Export*.

    In the **Available Items** section **The Equipment and Functional Location** entry appears.
15. Select the **The Equipment and Functional Location**box, and then select .
16. Select start **Import** Button.

    The new template is imported into GE Digital APM, and is available to download on the Data Loaders page.

Data Loaders	Templates
APM Family	
Equipment and Functional Location	
Tags to Assets Relationship	
Taxonomy	
Work History	

Test Data Loader Connection

Steps

1. Access the **Data Loaders** page.
2. If, on the upper-left corner of the page, the **<number> Error** link appears beside the , then select the link.

   Note: If the number of errors link does *not* appear, then the connections needed to use the data loaders are configured properly.

   The **Connection Errors** dialog box appears displaying the connections status for each connection point needed to use the data loaders.
3. Select **OK**.

   The connection status is tested.

Results

- The following table describes the connection status for data import jobs.

Connection Test	Description	If you get an Error...
APM Connect Web API Test	Test the connection between the GE Digital APM web API and the APM Connect server.	Ensure the ports are open between the GE Digital APM Server and the APM Connect server.
APM Connect Configuration Test	Test the configuration of the APM Connect connection parameters configured in GE Digital APM.	Ensure the parameters configured in GE Digital APM are correct to establish connection from GE Digital APM and APM Connect.
APM File-share Access Test	Tests the file share system is connected to the GE Digital APM Server, so that the server can read and write to the configured file shares.	Ensure the parameters configured in GE Digital APM are correct to establish connection from GE Digital APM, and the user has the necessary permissions to access the file share.
APM Staging Database Test	Tests the GE Digital APM Server is connected tot the APM Connect IR database.	Ensure that PostgresSQL is accepting the connection from GE Digital APM . These connections are managed in the file pg_hba.conf.
APM Connect Fileshare Access Test	Tests the file share system is connected to the APM Connect server, so that the server can read and write to the configured file shares.	Ensure the parameters configured in GE Digital APM are correct to establish connection from GE Digital APM, and the user has the necessary permissions to access the file share.
APM Connect Staging Database Test	Tests the connection between the APM Connect server and the IR database to ensure that files can read and written to the IR.	Ensure the RunDataLoaderRoute.cfg is configured correctly.

Run a Data Import Job

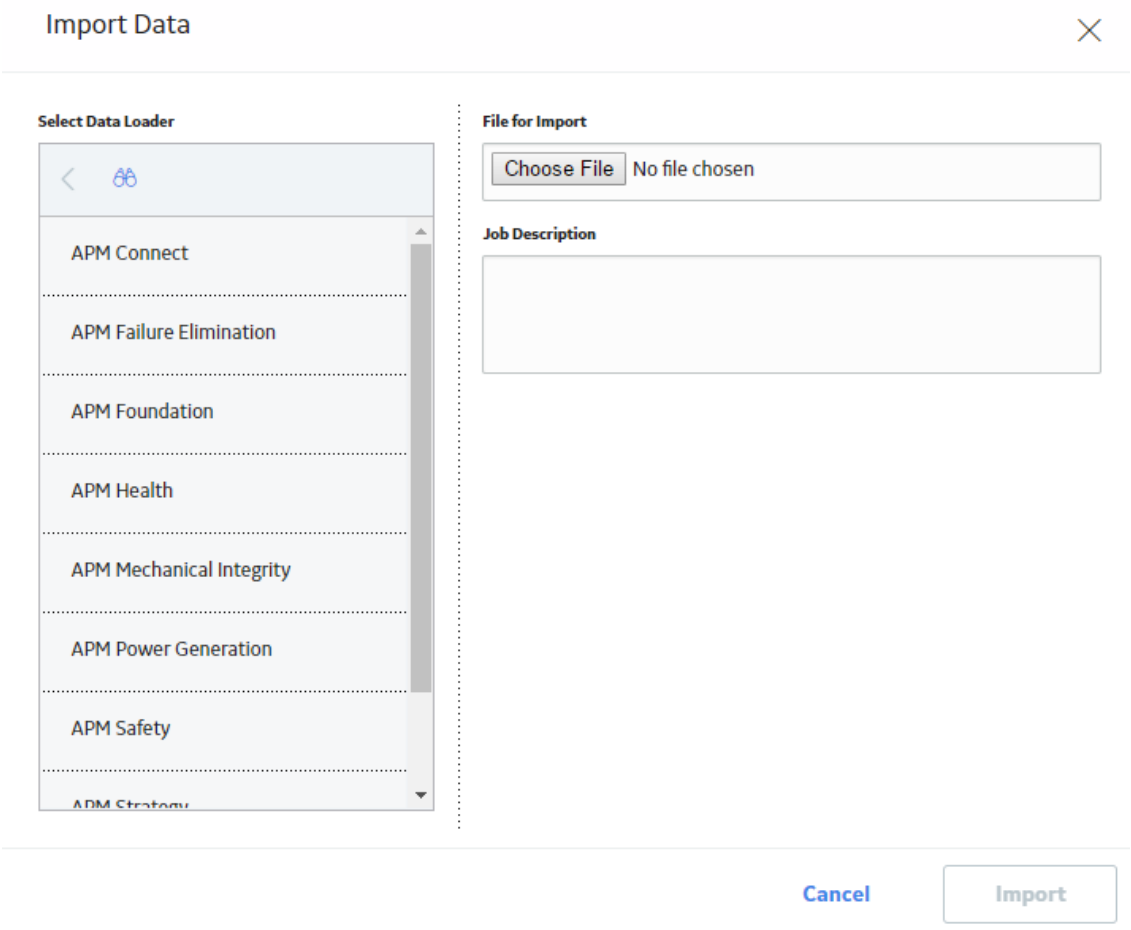
Before You Begin

This topic assumes that you have successfully migrated your data to the provided Excel workbooks for the modules into which you want to import data.

Steps

1. Access the **Data Loaders** page.
2. Select **Import New**.

   The **Import Data** window appears.



3. In navigation tree, select the data loader category, and then select the data loader that you want to use to import data according the following table.

Data Loader Category	Workbooks in the Category
APM Connect	APM Family , Equipment and Functional Location, Tag to Asset Relationship, Taxonomy, Work History
APM Failure Elimination	Production Loss Analysis (PLA) , Root Cause Analysis (RCA)
APM Foundation	Asset Criticality Analysis (ACA), Geographic Information System (GIS), Custom Asset HierarchyCustom Asset Hierarchy, Role
APM Health	Rounds Allowable Values , Rounds Readings, Rounds Routes, Rounds Templates
APM Mechanical Integrity	Inspection Management (IM) Assets, Inspection Management (IM) Functional Location, Risk Based Inspection (RBI) 580, Risk Based Inspection (RBI) 581, Risk Based Inspection (RBI) Corrosion Loop, Thickness Monitoring (TM) Equipment, Thickness Monitoring (TM) Functional Location
APM Power Generation	Generation Availability Analysis (GAA) Amplification Codes, Generation Availability Analysis (GAA) Cause Codes
APM Safety	Calibration, Hazards
APM Strategy	Asset Strategy Management (ASM), Asset Strategy Management (ASM) Templates, Failure Modes and Effects Analysis (FMEA), FMEA Analysis Template, FMEA Asset Template, Reliability Centered Maintainence (RCM)

4. In the **Select a File for importing** box, select **Choose File**, and then navigate to and select the Excel workbook that you want to import.
5. In the **Job Description** box, enter a short description of the job.
6. Select **Import**.

   The job is run, and the status of the job appears in the **Status and Log** column.

> ⓘ **Tip**: If necessary, you can cancel an import job by selecting the ✕ button that appears in the **Status and Log** column. If you cancel a job, any changes that have already occurred are *not* removed, therefore, you may need to manually modify records to update or remove unwanted data.

Status	Description
Waiting	Initial state when job is created. The data import job is queued for pre-processing on the APM Connect Server.
Staging In Progress	The data import job is being prepared on the APM Connect Server.
Staging Failure	The data import job failed during preparation.
Staging Complete	The data import job was prepared successfully.
Dataloader Enqueued	The maximum number of data load jobs has been exceeded, as determined in the APM Connect Connection Records, or there is a job of the same type running. The data import will begin once the other jobs are complete.
Configuring Dataloader	The data import job is configuring the proper user roles and arranging data processing for most efficient execution flow.
In Progress	The data import job is loading data into the GE Digital APM Data Source.
Data Synchronization in Progress	The data import job is synchronizing the loaded data and relationships across the APM Data Source.
Job Cancelling	The data import job is in the process of being cancelled. This occurs after you select ✕.
Cancelled by User	The data import job was cancelled successfully. **Note**: When a job is cancelled, the data imported prior to cancelling is not removed.
Errors	The data import is complete, but encountered one or more errors. You can download the log file to view detailed error messages.
Complete	Data has been imported into GE Digital APM. **Note**: If the ⚠ icon appears, the data was imported with warnings. You can download the log file to view detailed warning messages.

Access the Details of an Import Job

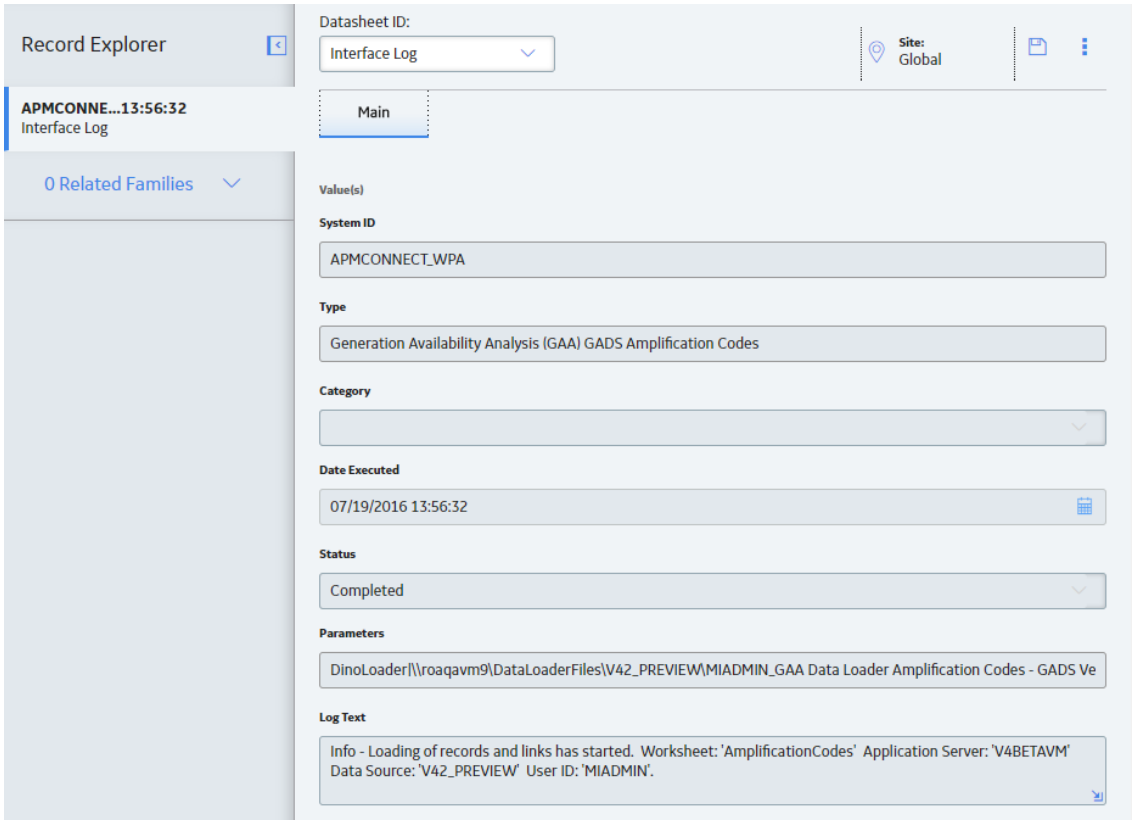
Before You Begin

This topic assumes that you have successfully run a data import job.

Steps

1. Access the **Data Loaders** page.
2. In the **Job ID** column, select the job that you want to open.

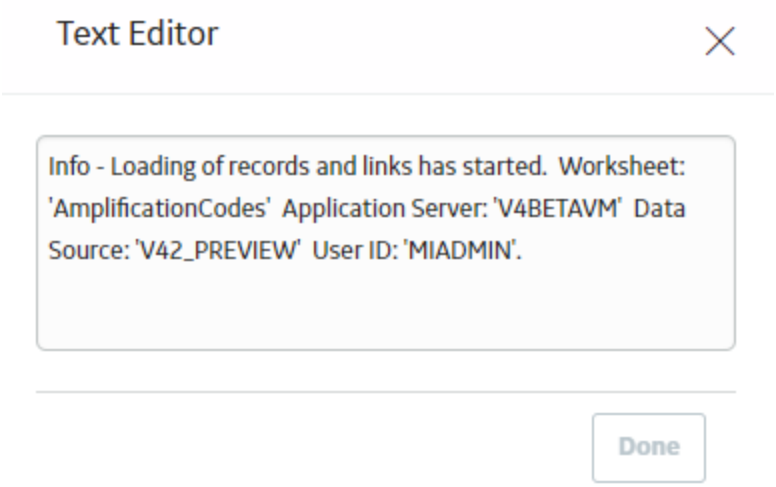
   On a new page, the datasheet for the selected job appears.



3. To view the information contained in the **Log Text**, select .

   The **Text Editor** window appears, displaying details about the job, such as error messages, warnings concerning the data load and general information regarding

the data records that were loaded.



About the Data Loaders

This topic provides a listing of all overviews and high level explanatory information to help you understand the APM Connect Data Loaders.

About the Data Loader Worksheets and Fields

Field formats for the data loader workbooks carry specific value and cell requirements. This topic contains guidelines for data/time format, units of measure (UOM), and cell color coding.

Cell Color Coding

In order to differentiate between required and recommended field values in the Excel workbook, cells adhere to the following color coding scheme:

- **Red**: a required field.
- **Blue**: a recommended field.

Site Reference Name	Functional Location Description
MI_SITE_NAME	MI_FNCLOC00_FNC_LOC_DESC_C

Note: The Column ID and Associated Field ID will both be colored the same.

Cells that Require Logical Values

When a cell corresponds to a field in GE Digital APM that requires a Logical value, you should enter *True* or *False*.

Character Limits in Character Fields

In GE Digital APM, family fields that have the Character data type (Character fields) restrict values to a maximum length. In the Excel workbooks, when entering data in a cell that represents a Character field, the values must not exceed the character limit of the corresponding field.

Date and Time Format

Dates should be entered in the following format: *YYYY-MM-DD hh:mm:ss*, where:

- **YYYY** is the four-digit year.
- **MM** is the two-digit month.
- **DD** is the two-digit day.
- **hh** is hours in 24-hour notation.
- **mm** is minutes.
- **ss** is seconds.

For example, a complete entry would be the following: *2015-05-01 17:53:00*. This corresponds to *5:53 PM on May 1, 2015*.

Note: Hours must be entered in 24-hour notation (e.g., 17:53:00, not 5:53:00). AM and PM should never be included. Unless otherwise noted in the applicable Mappings Document, times entered should be based on the time zone of the user who will be performing the data load."

Language

Data loader Excel workbooks are available with field captions in all baseline languages supported by GE Digital APM.

Reference Sheets

You can insert additional worksheets into your data loader workbook that will not be loaded into GE Digital APM by encasing the worksheet name in parentheses. For example, if you wanted to add a sheet to record notes on the data loaded into the workbook, you could add a worksheet named (Notes). Because the name of the worksheet is in parentheses, the worksheet will not be loaded into GE Digital APM.

Units of Measure

In the workbooks, values that correspond to a Unit of Measure (UOM) should be entered based on the current UOM Conversion Set setting for the Security User who will be performing the data load.

For example, if the UOM Conversion Set for the Security User is Metric, metric values should be entered in the Excel workbook.

In cells that correspond to a field that uses a UOM, you should not enter the actual UOM. For example, you should enter *10*, not *10 Inches*.

About GE Digital APM and the Data Loaders

When loading data into GE Digital APM, it is important to understand how GE Digital APM treats data, and the subsequent impact on data loads.

GE Digital APM Rules and the Data Loaders

GE Digital APM creates records based on the rules for that family. Therefore the data that is loaded into GE Digital APM via the Data Loaders are also subject to the same rules. This could result in blank Equipment records with no data if the rules for the family do not require data. Similarly there is no restriction on key fields having to contain a value other than what is required by the rules.

For example, the baseline Equipment family does not have any fields that are marked as required in the rules, so when using the data loaders, equipment records are created even with only one field populated in the worksheet. If you only populated Maintenance Plant on the APM data loader spreadsheet, then an equipment records would be created with only maintenance plant and no other identifying information.

About the Configuration Worksheet

Note: The **Configuration** Worksheet *cannot* be used by the Failure Modes and Effects Analysis (FMEA) Data Loader, the Reliability Centered Maintenance (RCM) Data Loader, Thickness Monitoring (TM) Equipment Data Loader, or the Thickness Monitoring (TM) Functional Location Data Loader.

The **Configuration** Worksheet is a common worksheet, which can be implemented by each of the data loaders. It allows you to control aspects of how your data is loaded such as batching and which other worksheets should be processed.

The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.

Worksheet	Description
Configuration	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.

Configuration Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: the corresponding worksheet will be processed. • False: The corresponding worksheet will *not* be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.

Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note**: The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

About the APM Connect Data Loaders

This topic provides a listing of all the APM Connect Data Loaders.

About the APM Family Data Loader

⚠**IMPORTANT:** GE Digital APM offers baseline data loaders to load data for various modules. Before using the APM Family Data Loader, ensure that a data loader does not already exist for the data that you want to load. For example, the Equipment and Functional Location Data Loader is delivered with the baseline product and can be used to load Equipment and Functional Location records. For a complete list of available data loaders, see the About the Data Loaders topic.

The APM Family Data Loader is designed to load data into any family defined in GE Digital APM, or it can be used to relate records in one family to another family in GE Digital APM based on the relationship definitions defined in Family Management. As such it does not load a specific data model. Because of this inherent flexibility, there is not a data loader source file template defined for every possible combination of entity families and relationships. Instead, there are sample data loader templates, populated with sample data, that can be used as models for creating other data loader templates. You can create APM Family Data Loader workbooks for the following purposes:

- Entity Family Data: Used to load data or records.

  -or-

- Relationship Family Data: Used to relate a record in an entity family to another record in different entity family.

Typically, the data loader workbooks used by the APM Family Data Loader are created using the metadata definitions configured in your GE Digital APM system. Additionally, due to the flexibility of the data loader, there are no standardized validation steps to verify that the data is loaded as intended. When the data is loaded, the APM Family Data Loader will trigger all of the associated field and family level rules, to ensure that the data is valid, but no further validations are done on the data. You should, however, verify that the intended data, records, or relationships are present in the GE Digital APM system after a data load has been completed.

About the APM Family Data Loader Requirements

Determine Load Type: Single Family or Two Related Families

The APM Family Data Loader supports loading records into a single family, or you can load records into one family and records into another family and link the two records together. The type of data that you want to load will determine the sample template with which you will start.

Determine What Families and Relationships to Populate

You can determine which families are available and how families are related in Family Management. To access Family Management:

1. Log in to GE Digital APM.
2. On the left navigation menu, select **Admin**, and the select **Family Management**.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role. Depending on the type of data that the Security User wants to load, the user may need to be associated with additional Security Roles to grant privileges to create the necessary records. To determine if additional Security Role association is needed to create a particular type of record, consult the About Roles topic in the GE Digital APM Administrative User Help documentation.

About the APM Family Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

General Loading Strategy Workflow

1. Determine if you want to load data into a single family or into two families that are related to each other.
2. Access a sample APM Family Data Loader source file based on the type of load determined in step 1.
3. Determine what families and or relationships you want to populate using the APM Family Data Loader.
4. Export the metadata that reflects the metadata definition for the family or families into which you want to load data.
5. Populate the **Configuration** worksheet.
6. Populate the column headers of the **<Data>** worksheet using the exported metadata.
7. As needed, modify the worksheets to populate unit of measure to apply the correct unit of measure to any of the numeric fields.
8. As needed, modify the worksheets to populate time zones to convert any date or time fields to the correct time zone.

About the APM Family Data Loader Workbook Lay-out and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the APM Family Data Loader, GE Digital provides an Excel workbook that must be used to perform the data load.

The following table lists the worksheets that are included in the **APM Family.xlsx** workbook.

Worksheet	Description
Configuration	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
<data>	Where you specify the actual data to be loaded.

Each worksheet in the APM Data Loader workbook contains field values that can be mapped to the appropriate GE Digital APM family/field.

Configuration Worksheet

The Configuration worksheet tells the APM Family Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the Configuration worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will *not* be processed.

Field Caption	Field ID	Data Type (Length)	Comments
Data Work-sheet ID	DATA_ WORKSHEET_ ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE		The value is this column should be *Entity* or *Relationship* depending on the type of data that is being loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Family ID	PRED_ FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_ FAMILY_KEY_ FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_ INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_ FAMILY_ID	Character	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Field Caption	Field ID	Data Type (Length)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is *Entity*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE

Field Caption	Field ID	Data Type (Length)	Comments
Insert with Null Values?	OPTION_ INSERT_ON_ NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_ UPDATE_ON_ NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Replace an Existing Link?	OPTION_ REPLACE_ EXISTING_ LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship *Location Contains Asset* that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.

Field Caption	Field ID	Data Type (Length)	Comments
Allow Change of Family?	OPTION_ ALLOW_ CHANGE_OF_ FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

<Data> Worksheet

There is no preexisting format that must be adhered to on the **<data>** worksheet, because the APM Data Loader operates on a flexible framework. Field captions and ID are determined based on the data that you want to load.

Use the metadata exported from GE Digital APM to construct the **<data>** worksheet, to populate the rows with the actual data that will be loaded.

⚠**IMPORTANT:** If a field is calculated in GE Digital APM, it cannot be populated through the data loader. If you attempt to load these fields, a warning will appear in the log.

Steps: Export Metadata

Get a copy of the metadata definitions for the family or families that you will be working with to load data.

1. Login to GE Digital APM.
2. On the left navigation menu, select **Admin**, then select **Configuration Manager**, and then select **Export**.
3. At the top of the page, in the **File Name** box, enter a file name and in the **File Type** box, select **Excel (.xlsx)**.
4. In the **Select metadata type** box, select **Families, Fields and Field Behaviors**.
5. Select the family or families that you want to export and move them to the **Selected Items** list.

   ⓘ **Tip**: Be sure to order the families in the order in which you want the fields to appear in the export.

6. Select **Start Export**.

   The metadata is exported, and can be used to populate the **<data>** worksheet.

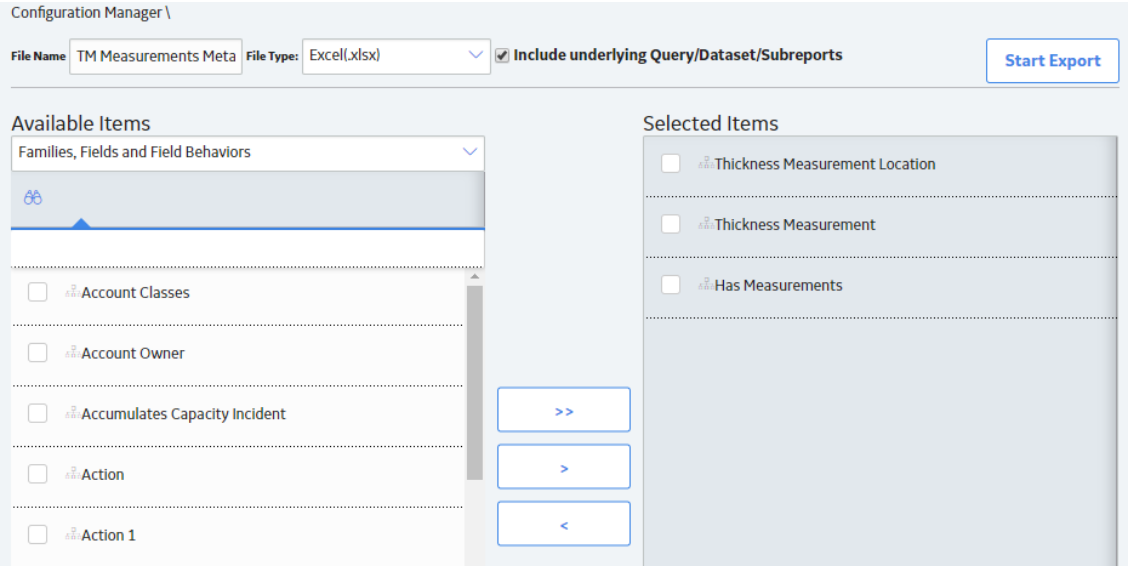
7. Save the metadata.

Example: Export Metadata to Load Thickness Measurements

If you want to load Thickness Measurements into APM, since Thickness Measurements needs to be related to a Thickness Measurement Location, you must also export that family along with the Has Measurements relationship family.

1. Log in to GE Digital APM.
2. On the left navigation menu, select **Admin**, then select **Configuration Manager**, and then select **Export**.
3. At the top of the page, in the **File Name** box, enter a file name (e.g., TM Measurements Metadata).
4. In the **File Type** box, select **Excel (.xlsx)**.
5. In the **Select metadata type** box, select **Families, Fields, Fields Behaviors**, and then select the following families:
   - Thickness Measurement Location
   - Thickness Measurement
   - Has Measurements.

ⓘ**Tip**: Export the families in this order. This is how the fields appear in the export file.



6. Select **Start Export**.

   The metadata is exported, and can be used to populate the **<data>** worksheet.

7. Save the metadata.

   This exported metadata, is used to build source file template.

Configure the Data Loader Source File to Use Units of Measure

Sometimes the data that is being loaded, is in a different unit of measure than the one associated with the corresponding field in GE Digital APM. When this is the case, the APM Family Data Loader allows for you to specify the unit of measure that is tied to a specific row and column. This is done by copying the column to which the unit of measure is tied, and then adding the suffix */UOM* to the end of the Column ID. Then, in the data, specify the unit of measure ID for the data being loaded. This unit of measure ID needs to be a valid unit of measure as defined GE Digital APM, and a valid conversion needs to be specified for the unit of measure specified and the field's unit of measure. Please note that if a unit of measure is not specified, then it will use the field's unit of measure, as defined inGE Digital APM.

Configure the Data Loader Source File to use Time Zones

Sometimes date and time data that is being loaded was collected in a different time zone than the time zone associated with the current user. When this is the case, the APM Family Data Loader allows you to specify the time zone that is tied to a specific row

and column. This is done by copying the column to which the time zone is tied, and then adding the suffix */TZ* to the end of the Column ID. Then, in the data, specify the time zone for the data being loaded. Please note that if a time zone is not specified, then it will use the time zone defined for the current user.

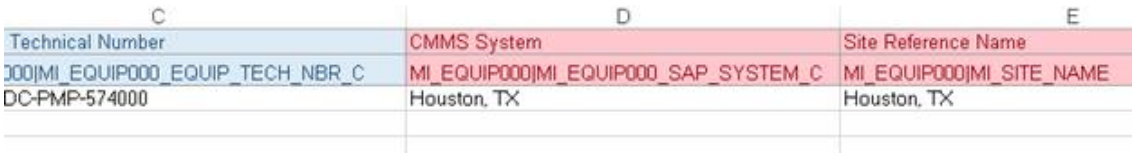
About Populating Site Reference Data

The APM Family Data Loader can be used to populate the Site Reference on Equipment and Functional Location records in GE Digital APM. The APM Family Data Load-erpopulates the ENTY_KEY system field and the MI_SITE_KEY system field associated with the Site Reference value to be populated. On asset records, the Site Reference is stored in the MI_SITE_KEY field, a system field in GE Digital APM. The APM Data Loader uses the Site Name (MI_SITE_NAME) to translate the value to the corresponding Site Key and pop-ulate the MI_SITE_KEY field; therefore, you do not need to know the key to be able to populate the site reference. This functionality is important because this value can change from one database to another.

Steps: Populate Site Reference Using the Site Name

1. On the data worksheet, add a column that contains MI_SITE_NAME in the column name.

   For example if you are working with a relationship, where a distinction needs to be made regarding which family is associated with each column, then the column name will be prefaced with the Family ID. As shown in the following image, the column name might take the form 'MI_EQUIP000|MI_SITE_NAME', where MI_EQUIP000 is the Family ID.



C	D	E
Technical Number	CMMS System	Site Reference Name
000|MI_EQUIP000_EQUIP_TECH_NBR_C	MI_EQUIP000|MI_EQUIP000_SAP_SYSTEM_C	MI_EQUIP000|MI_SITE_NAME
DC-PMP-574000	Houston, TX	Houston, TX

2. Enter the site name to designate the site by which the asset record, once loaded into GE Digital APM, will be filtered.
3. Continue populating the source workbook, and then run the data loader.

   The site reference value will filter the equipment records as determined in the source workbook.

Example APM Family Workbooks

In addition to the APM Family Data Loader workbook, you can access an example workbook *Foundation_APM_Data_Loader-Health Indicators and Readings example.xlsx*. This example workbook illustrates how you can use the APM Family Data Loader to load records into a defined GE Digital APM family and link records in one family to another. You can use the information in this example as a model to configure or define templates for loading data into any baseline or custom family.

The data loader in this example creates Health Indicator records in GE Digital APM, links the Health Indicator records to Equipment records, and then links the Health Indicator records to Health Indicator Mapping records. Finally, the data loader loads Readings for one of the Health Indicators. In addition, the example spreadsheet includes how you can use a reference worksheet to store list values and other reference information that users can use when populating the data loader template with data.

Populate the Configuration Worksheet

The Configuration worksheet tells the APM Family Data Loader what types of data are being loaded and how the data is to be loaded.

Populate the HealthIndicators Worksheet

The HealthIndicators worksheet is populated with the actual Health Indicator records you want to load into GE Digital APM.

Populate the HealthIndicatorsEquipment Worksheet

The HealthIndicatorsEquipment worksheet is populated with the key field values for the Equipment records to which the Health Indicators on the HealthIndicators worksheet will be linked once loaded into GE Digital APM.

Populate the HealthIndicatorMappings Worksheet

The HealthIndicatorMappings worksheet is populated with the Health Indicator Mappings to load into GE Digital APM.

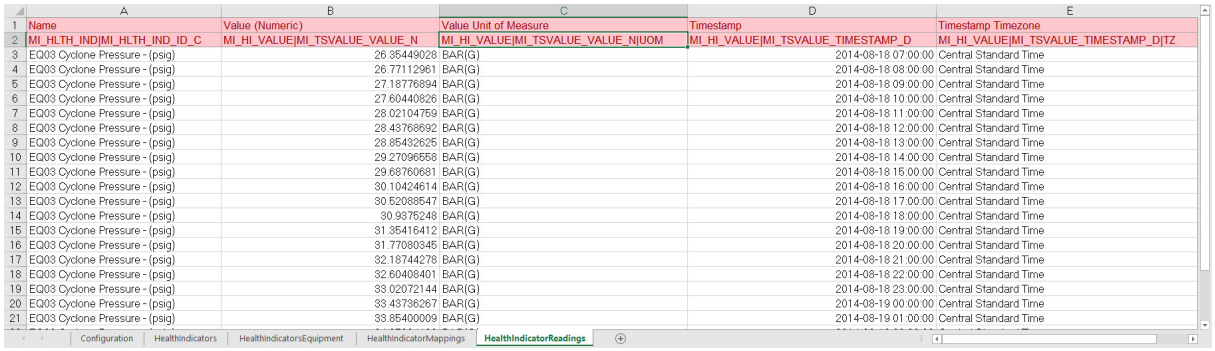
Populate the HealthIndicatorReadings Worksheet

The HealthIndicatorReadings worksheet is populated with the actual Health Indicators data you want to load into GE Digital APM.

On this worksheet, Column C illustrates a feature of the APM Family Data Loader where the unit of measure for a given field can be indicated, so that it can be converted to the baseline unit of measure if needed. Assume, for example, that the MI_TSVALUE_VALUE_N field was defined in GE Digital APM as being stored in PSIG, but the data in the spreadsheet was represented by BAR(G). As shown in the following image, you can add the UOM column to indicate to that the unit of measure for the source data is BAR(G). When

this column is added, the APM Family Data Loader will convert the data from BAR(G) to PSIG (assuming that there is a unit of measure conversion defined for this in GE Digital APM).

Tip: For more information, refer to the units of measure documentation.

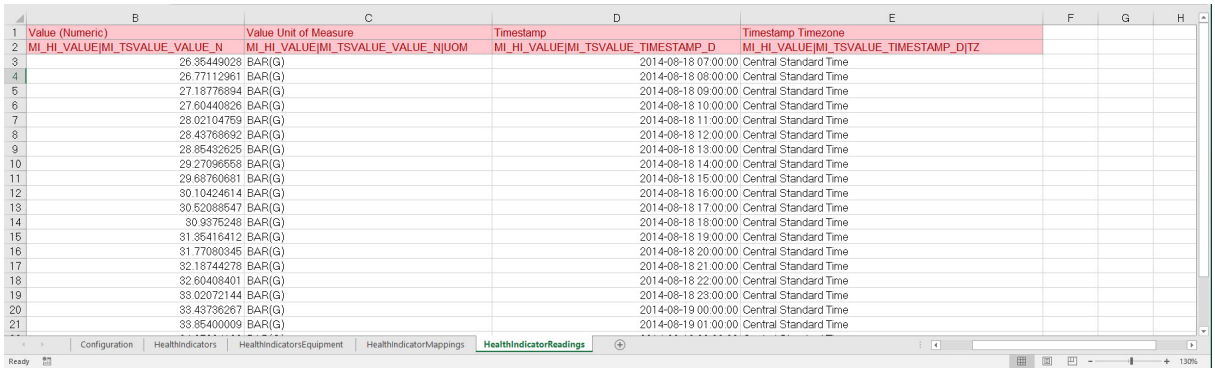


	A	B	C	D	E
1	Name	Value (Numeric)	Value Unit of Measure	Timestamp	Timestamp Timezone
2	MI_HLTH_IND|MI_HLTH_IND_ID_C	MI_HI_VALUE|MI_TSVALUE_VALUE_N	MI_HI_VALUE|MI_TSVALUE_VALUE_N|UOM	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D|TZ
3	EQ03 Cyclone Pressure - (psig)	26.35449028	BAR(G)	2014-08-18 07:00:00	Central Standard Time
4	EQ03 Cyclone Pressure - (psig)	26.77112961	BAR(G)	2014-08-18 08:00:00	Central Standard Time
5	EQ03 Cyclone Pressure - (psig)	27.18776894	BAR(G)	2014-08-18 09:00:00	Central Standard Time
6	EQ03 Cyclone Pressure - (psig)	27.60440826	BAR(G)	2014-08-18 10:00:00	Central Standard Time
7	EQ03 Cyclone Pressure - (psig)	28.02104759	BAR(G)	2014-08-18 11:00:00	Central Standard Time
8	EQ03 Cyclone Pressure - (psig)	28.43768692	BAR(G)	2014-08-18 12:00:00	Central Standard Time
9	EQ03 Cyclone Pressure - (psig)	28.85432625	BAR(G)	2014-08-18 13:00:00	Central Standard Time
10	EQ03 Cyclone Pressure - (psig)	29.27096558	BAR(G)	2014-08-18 14:00:00	Central Standard Time
11	EQ03 Cyclone Pressure - (psig)	29.68760681	BAR(G)	2014-08-18 15:00:00	Central Standard Time
12	EQ03 Cyclone Pressure - (psig)	30.10424614	BAR(G)	2014-08-18 16:00:00	Central Standard Time
13	EQ03 Cyclone Pressure - (psig)	30.52088547	BAR(G)	2014-08-18 17:00:00	Central Standard Time
14	EQ03 Cyclone Pressure - (psig)	30.9375248	BAR(G)	2014-08-18 18:00:00	Central Standard Time
15	EQ03 Cyclone Pressure - (psig)	31.35416412	BAR(G)	2014-08-18 19:00:00	Central Standard Time
16	EQ03 Cyclone Pressure - (psig)	31.77080345	BAR(G)	2014-08-18 20:00:00	Central Standard Time
17	EQ03 Cyclone Pressure - (psig)	32.18744278	BAR(G)	2014-08-18 21:00:00	Central Standard Time
18	EQ03 Cyclone Pressure - (psig)	32.60408401	BAR(G)	2014-08-18 22:00:00	Central Standard Time
19	EQ03 Cyclone Pressure - (psig)	33.02072144	BAR(G)	2014-08-18 23:00:00	Central Standard Time
20	EQ03 Cyclone Pressure - (psig)	33.43736267	BAR(G)	2014-08-19 00:00:00	Central Standard Time
21	EQ03 Cyclone Pressure - (psig)	33.85400009	BAR(G)	2014-08-19 01:00:00	Central Standard Time

Configuration | HealthIndicators | HealthIndicatorsEquipment | HealthIndicatorMappings | HealthIndicatorReadings

Additionally, column E of the HealthIndicatorReadings worksheet illustrates how time zones can be configured. Notice the appendage to the field name as shown in the following image. Adding a column where the Field ID is appended with a */TZ* indicates the timezone of the source column data.

Note: If a timezone is not specified, any Date and Time field values are assumed to be in the same timezone as the user who is loading the data.



	B	C	D	E	F	G	H
1	Value (Numeric)	Value Unit of Measure	Timestamp	Timestamp Timezone			
2	MI_HI_VALUE|MI_TSVALUE_VALUE_N	MI_HI_VALUE|MI_TSVALUE_VALUE_N|UOM	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D	MI_HI_VALUE|MI_TSVALUE_TIMESTAMP_D|TZ			
3	26.35449028	BAR(G)	2014-08-18 07:00:00	Central Standard Time			
4	26.77112961	BAR(G)	2014-08-18 08:00:00	Central Standard Time			
5	27.18776894	BAR(G)	2014-08-18 09:00:00	Central Standard Time			
6	27.60440826	BAR(G)	2014-08-18 10:00:00	Central Standard Time			
7	28.02104759	BAR(G)	2014-08-18 11:00:00	Central Standard Time			
8	28.43768692	BAR(G)	2014-08-18 12:00:00	Central Standard Time			
9	28.85432625	BAR(G)	2014-08-18 13:00:00	Central Standard Time			
10	29.27096558	BAR(G)	2014-08-18 14:00:00	Central Standard Time			
11	29.68760681	BAR(G)	2014-08-18 15:00:00	Central Standard Time			
12	30.10424614	BAR(G)	2014-08-18 16:00:00	Central Standard Time			
13	30.52088547	BAR(G)	2014-08-18 17:00:00	Central Standard Time			
14	30.9375248	BAR(G)	2014-08-18 18:00:00	Central Standard Time			
15	31.35416412	BAR(G)	2014-08-18 19:00:00	Central Standard Time			
16	31.77080345	BAR(G)	2014-08-18 20:00:00	Central Standard Time			
17	32.18744278	BAR(G)	2014-08-18 21:00:00	Central Standard Time			
18	32.60408401	BAR(G)	2014-08-18 22:00:00	Central Standard Time			
19	33.02072144	BAR(G)	2014-08-18 23:00:00	Central Standard Time			
20	33.43736267	BAR(G)	2014-08-19 00:00:00	Central Standard Time			
21	33.85400009	BAR(G)	2014-08-19 01:00:00	Central Standard Time			

Configuration | HealthIndicators | HealthIndicatorsEquipment | HealthIndicatorMappings | HealthIndicatorReadings

Ready

About the Equipment and Functional Location Data Loader

The Equipment and Functional Location Data Loader allows a user to import data from an Excel workbook. The user is able to build out the asset hierarchy based on structure defined in the Excel workbook.

About the Equipment and Functional Location Data Loader Requirements

Equipment Taxonomy data must be present prior to loading Equipment and Functional Location data.

Mapping

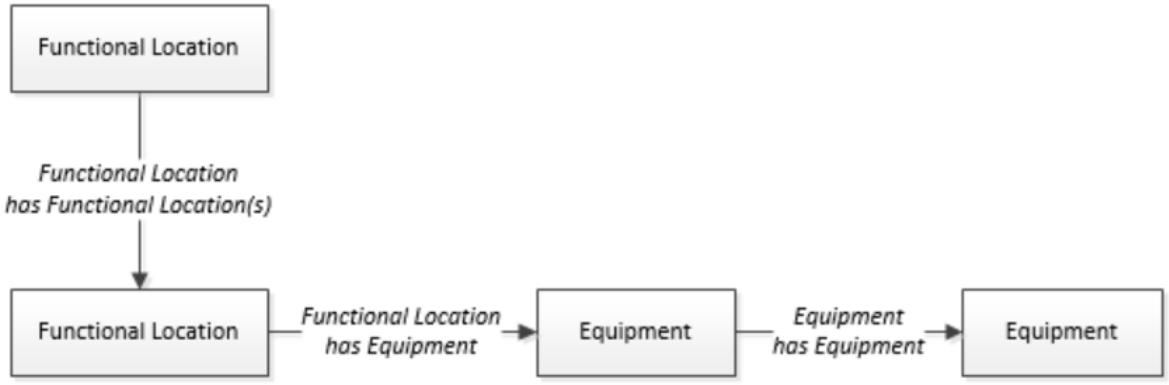
The Equipment and Functional Location Data Loader maps the datasheet columns in the Excel workbook to fields in GE Digital APM families by position. The captions may be changed as needed, but the column positions should not be moved.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

About the Equipment and Functional Location Data Loader Data Model

The data for Equipment and Functional Location is loaded from a single Excel workbook containing multiple worksheets. This includes Functional Locations and Equipment.



The Functional Location can be linked to a parent Functional Location using the relationship *Functional Location Has Functional Location(s)*.

About the Equipment and Functional Location Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, refer to the Data Model section.

Load Sequence

The Equipment and Functional Location data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records:

1. Create the Functional Location.
2. Create the Equipment.

Limitations

- The Functional Location hierarchy can be constructed in the loader by assigning the parent Functional Location (superseding Functional Location) to the child record.
- The top-level parent node will not be automatically designated by the data loader, and must be explicitly defined in the Excel source workbook.

  In the Parent Functional Location Internal ID column, you must enter *ROOT* in the row(s) to indicate that the Functional Location should be treated as the root in GE Digital APM. After processing the data loader with the root level indicator, the Functional Location will be populated under the Home level in the Asset Hierarchy, with the details provided in the spreadsheet.
- CMMS-ID is a required field that is intended to identify the original source of the data and part of the key value.
- After loading Equipment records into GE Digital APM with a specific site reference, you *cannot* update the Equipment records to have global site references by reimporting the workbook with the site reference column updated to global on the Equipment worksheet. To update Equipment records to have global site references, you must update the predecessor Functional Locations with the site reference value *Global* on the worksheet.

  In GE Digital APM, records inherit their site references from their predecessor records. Additionally, when the Equipment and Functional Location Data Loader is run, it loads Equipment records first, and then loads Functional Location records. Therefore, to change the equipment record's site reference to global, you would need to re-import the workbook with the Functional Location record indicating a *Global* site reference.

About the Equipment and Functional Location Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Equipment and Functional Location Data Loader, GE Digital provides an Excel workbook, **Equipment and Functional Location.xlsx**, which supports baseline data loading of equipment and functional locations in GE Digital APM. This workbook must be used to perform the data load.

The master Excel workbook contains one worksheet for each node that will be populated in the data model.

The following table lists the worksheets that are included in the Equipment and Functional Location Data Loader workbook.

Note: Worksheets in the workbook not being used may be left blank, but should not be deleted from the workbook.

Worksheet	Description
Configuration	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
Equipment	This worksheet is used to specify data for import to the Equipment family.
FunctionalLocations	This worksheet is used to specify data for import to the Functional Location family.
FuncLocsToEquipment	This worksheet is used to link existing Functional Location records to existing Equipment records.
FuncLocsToSuperiorFuncLocs	This worksheet is used to link existing Functional Locations to superior Functional Locations.

Configuration Worksheet

The Configuration worksheet tells the Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the Configuration worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will *not* be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE		The value is this column should be *Entity* or *Relationship* depending on the type of data that is being loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Family ID	PRED_ FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_ FAMILY_KEY_ FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_ INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_ FAMILY_ID	Character	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Field Caption	Field ID	Data Type (Length)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is *Entity*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE

Field Caption	Field ID	Data Type (Length)	Comments
Insert with Null Values?	OPTION_ INSERT_ON_ NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_ UPDATE_ON_ NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Replace an Existing Link?	OPTION_ REPLACE_ EXISTING_ LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship *Location Contains Asset* that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.

Field Caption	Field ID	Data Type (Length)	Comments
Allow Change of Family?	OPTION_ ALLOW_ CHANGE_OF_ FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

Equipment Worksheet

On the Equipment worksheet, you will specify Equipment that you want to load into GE Digital APM.

Note: Each row in this worksheet represents a *unique* asset. You should not include the same asset more than once.

Field Caption	Field Column Name	Data Type (Length)	Comment
Maintenance Plant	MI_ EQUIP000_ MAINT_ PLANT_C	Character (50)	This field is required, and is used to group or batch the equipment records.

Field Caption	Field Column Name	Data Type (Length)	Comment
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (225)	This is a key field.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	None
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This is a key field.
Site Reference Name	MI_SITE_NAME	Character (255)	⚠ **IMPORTANT:** Site Reference records must preexist in GE Digital APM. The data loader does not create Site Reference records, but simply provides foreign key data in the asset records, as determined in the source workbook. If the site reference record does not preexist, then you will receive an error. A. Enter the site name to designate which site the Equipment record, once loaded into GE Digital APM, will be filtered by. -or- B. Enter *Global* to indicate a that the site reference should be left global. Meaning that it will not be filtered by site in GE Digital APM. **Note**: Only super users are permitted to update Site Reference records.

Field Caption	Field Column Name	Data Type (Length)	Comment
Equipment Short Description	MI_EQUIP000_EQUIP_SHRT_DESC_C	Character (255)	None
Equipment Long Description	MI_EQUIP000_EQUIP_LNG_DESC_T	Text	None
Object Type (Taxonomy Mapping Value)	MI_EQUIP000_OBJ_TYP_C	Character (50)	None
Equipment System Status	MI_EQUIP000_SYS_ST_C	Character (255)	None
Manufacturer	MI_EQUIP000_MFR_C	Character (255)	None
Model Number	MI_EQUIP000_MOD_NO_C	Character (255)	None
Equipment Serial Number	MI_EQUIP000_SN_C	Character (255)	None
Active	'MI_EQUIP000_ACTIVE_F	Logical	None

Field Caption	Field Column Name	Data Type (Length)	Comment
Equipment uniquely identified by SAP System - Equipment ID	MI_EQUIP000_UNIQUE_ID_C	Character (550)	This field uniquely identifies the equipment using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note**: You should not use this field if you have an on-premises implementation of GE Digital APM.

FunctionalLocations Worksheet

On the FunctionalLocations worksheet, you enter information for Functional Locations and the Functional Location hierarchy.

Note: Each row in this worksheet represents a *unique* asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	MI_FNCLOC00_MAINT_PLNT_C	Character (50)	None
Functional Location Internal ID	MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.
Functional Location	MI_FNCLOC00_FNC_LOC_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	This is a key field.
Site Reference Name	MI_SITE_NAME	Character (255)	⚠**IMPORTANT:** Site Reference records must preexist in GE Digital APM. The data loader does not create Site Reference records, but simply provides foreign key data in the asset records, as determined in the source workbook. If the site reference record does not preexist, then you will receive an error. a. Enter the site name to designate the site by which the Functional Location record, once loaded into GE Digital APM, will be filtered. -or- b. Enter *Global* to indicate a that the site reference should be left global. Meaning that it will not be filtered by site in GE Digital APM. **Note**: Only Super Users are permitted to update Site Reference records.
Functional Location Description	MI_FNCLOC00_FNC_LOC_DESC_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location Long Description	MI_FNCLOC00_FNC_LOC_LNG_DESC_C	Text	None
Object Type (Taxonomy Mapping Value)	MI_FNCLOC00_OBJ_TYP_C	Character (50)	None
System Status	MI_FNCLOC00_SYS_STATUS_C	Character (255)	None
Is a Process Unit?	SC_FNCLOC00_IS_A_PROCE_UNIT_L	Logical	None
Functional Location uniquely identified by SAP System - Functional Location Internal ID	MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note**: You should not use this field if you have an on-premises implementation of GE Digital APM.

FuncLocsToEquipment

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	MI_FNCLOC00_MAINT_PLNT_C	Character (50)	None
Functional Location Internal ID	MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.
Functional Location	MI_FNCLOC00|MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	This is a key field. Functional Location CMMS System.
Functional Location uniquely identified by SAP System - Functional Location ID	MI_FNCLOC00|MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note**: You should not use this field if you have an on-premises implementation of GE Digital APM.
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (225)	This is a key field.

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This is a key field. Equipment CMMS System.
Equipment uniquely identified by SAP System - Equipment ID	MI_EQUIP000|MI_EQUIP000_UNIQUE_ID_C	Character (550)	This field uniquely identifies the equipment using the format <CMMS System> - <Equipment ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note**: You should not use this field if you have an on-premises implementation of GE Digital APM.

FuncLocsToSuperiorFuncLocs

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	<PRED_FAMILY_ID>|MI_FNCLOC00_MAINT_PLNT_C	Character (50)	None
Functional Location Internal ID	<PRED_FAMILY_ID>|MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location	<PRED_FAMILY_ID>|MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	<PRED_FAMILY_ID>|MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	This is a key field. Functional Location CMMS System.
Functional Location uniquely identified by SAP System - Functional Location ID	<PRED_FAMILY_ID>|MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note**: You should not use this field if you have an on-premises implementation of GE Digital APM.
Predecessor Family ID	PRED_FAMILY_ID	Character (255)	None
Functional Location Internal ID	<SUCC_FAMILY_ID>|MI_FNCLOC00_INTERNAL_ID_C	Character (30)	This is a key field.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location	<SUCC_FAMILY_ID>|MI_FNCLOC00_FNC_LOC_C	Character (50)	None
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	This is a key field. Equipment CMMS System.
Functional Location uniquely identified by SAP System - Functional Location ID	<SUCC_FAMILY_ID>|MI_FNCLOC00_UNIQUE_ID_C	Character (550)	This field uniquely identifies the functional location using the format <CMMS System> - <Functional Location ID>. This value allows the Data Loader to associate records between the Meridium database and the Predix database. **Note**: You should not use this field if you have an on-premises implementation of GE Digital APM.
Successor Family ID	SUCC_FAMILY_ID	Character (255)	This is a key field.

About the Tags to Assets Relationship Data Loader

Unlike other APM Connect Data Loaders, which are used to input new data into GE Digital APM, the Tags to Assets Relationship Data Loader manages relationships between existing GE Digital APM records. Specifically, you can use the data loader to manage the relationships between asset records (Equipment records and Functional Location records) and the following tag records:

- **GE Tag Records:** Stores values that are transferred from the GE System data source.
- **AMS Asset Records:** Store values that are transferred from the AMS Analytics data source.
- **OPC Tag Records:** Stores values that are transferred from OPC systems.

You can use the data loader to accomplish four different objectives:

1. Link tags to Equipment records.
2. Link tags to Functional Location records.
3. Unlink tags from Equipment records.
4. Unlink tags from Functional Location records.

About the Tags to Assets Relationship Data Loader Requirements

The Tags to Assets Relationship Data Loader manages existing relationships in GE Digital APM. Therefore, you must have existing Tag records and existing Equipment records and/or Functional Location records in your GE Digital APM system so that they can be linked together.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role as well as the MI AMS Suite APM Administrator Role.

About the Tags to Assets Relationship Data Loader General Loading Strategy

The Tags to Assets Relationship Data Loader manages relationships between existing GE Digital APM records including: Tag records, Equipment records, and Functional Location records.

Link Assets and Tags: Equipment Records

1. On the TagRelationship worksheet, populate the tag fields *M2M System ID*, *Tag ID*, and *Tag Family ID*.
2. Populate the Equipment fields *Equipment ID*, *Equipment CMMS System*, and Equipment Family ID.

Link Assets and Tags: Functional Location Records

1. On the TagRelationship worksheet, populate the tag fields *M2M System ID*, *Tag ID*, and *Tag Family ID*.
2. Populate the Functional Location fields *Functional Location Internal ID, Functional Location CMMS System*, and the *Functional Location Family ID*.

Unlink Assets and Tags: Equipment Records

1. On the TagRelationship worksheet, populate the tag fields *M2M System ID*, *Tag ID*, and *Tag Family ID*.
2. Clear the Equipment fields *Equipment ID* and *Equipment CMMS System ID*.
3. Populate the *Equipment Family ID* field.

Unlink Assets and Tags: Functional Location Records

1. On the TagRelationship worksheet, populate the tag fields *M2M System ID*, *Tag ID*, and *Tag Family ID*.
2. Clear the Functional Location fields *Functional Location Internal ID* and *Functional Location CMMS System ID*.
3. Populate the *Functional Location Family* field.

About Linking Custom Equipment or Functional Location Families

The following fields can be modified on the worksheet to accommodate linking and unlinking tags and assets in custom equipment or functional location families:

- MI_TAG_ID_C
- MI_EQUIP000_SAP_SYSTEM_C
- MI_EQUIP000_EQUIP_ID_C
- MI_FNCLOC00_SAP_SYSTEM_C
- MI_FNCLOC00_INTERNAL_ID_C

For example, if you are loading data into a custom asset family with an ID of MC_ASSET and using the custom asset ID field is MC_ASSET_ID_C, then you can modify the standard MI_EQUIP000_EQUIP_ID_C field to MI_EQUIP000_EQUIP_ID_C|MC_ASSET_ID_C. You will also want to make sure that the custom family ID is the Equipment Family ID field.

Note: You must keep the original ID, and appended it with a pipe character (|) plus custom ID value.

About the Tags to Assets Relationship Data Loader Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to manage asset and tags relationships GE Digital provides an Excel workbook, **Tags to Assets Relationship.xlsx**, which supports linking and unlinking tag records to Equipment and Functional Location records.

The following table lists the worksheets that are included in Tags to Assets Relationship Data Loader workbook.

Worksheet	Description
TagRelationships	The only worksheet used by the Asset and Tag Data Loader. It is used to determine which tags to link/unlink to which Equipment or Functional Location records.

TagRelationship Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
M2M System ID	MI_TAG_SYSTEM_ID_C	Character	Logical grouping of tags within a plant. The user will need to set a unique system ID for this field to use. This value corresponds to the Parent System Id field in the GE Digital APM database.
Tag ID	MI_TAG_ID_C	Character	The ID of the tag to be linked.
Tag Family ID	TAG_FAMILY_ID	Character	Family to which the tag belongs. The default value for AMS Assets is MI_APTAG.
Equipment CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character	None

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Internal ID	MI_ EQUIP000_ EQUIP_ID_ C	Character	None
Equipment Family ID	EQUIP_ FAMILY_ID	Character	The Default value is MI_ EQUIP000.
Functional Location CMMS System	MI_ FNCLOC00_ SAP_ SYSTEM_C	Character	None
Functional Location Internal ID	MI_ FNCLOC00_ INTERNAL_ ID_C	Character	None
Functional Location Family ID	FUNC_ LOC_ FAMILY_ID	Character	The default value is MI_FNCLOC00.

About the Taxonomy Data Loader

The Taxonomy Data Loader loads data from a standard Excel workbook into the Taxonomy data model. The data loader will create or update Taxonomy Categories, Classes, and Types based on the data in the Excel workbook.

About the Taxonomy Data Loader Requirements

As the taxonomy structure is a foundation for analysis and reporting, users should clearly understand the usage and data model for Taxonomy related records prior to implementing the Taxonomy structure.

Mapping

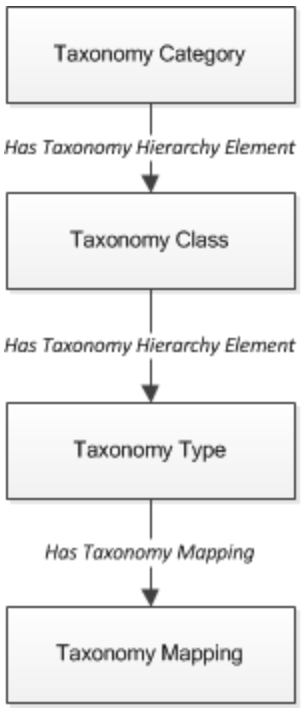
The Taxonomy Data Loader maps the datasheet columns in the Excel workbook to fields in GE Digital APM families by position. The captions may be changed as needed, but the column positions should not be moved.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

About the Taxonomy Data Loader Data Model

The data for a Taxonomy location is loaded from a single Excel workbook containing a single worksheet.



About the Taxonomy Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, refer to the Data Model section.

Load Sequence

The Taxonomy data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records:

1. Taxonomy Category
2. Taxonomy Class
3. Taxonomy Type
4. Taxonomy Mapping Values

About the Taxonomy Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Taxonomy Data Loader , GE Digital provides an Excel workbook, **Taxonomy.xlsx**, which supports baseline data loading of Taxonomy in GE Digital APM. This workbook must be used to perform the data load. On the Taxonomy worksheets, you will enter the information to load a taxonomy structure that will be assigned to assets within GE Digital APM.

The baseline file is organized such that each row is capable of creating one node in the data model when all columns contain the appropriate values.

The following table lists the worksheets that are included in the Taxonomy Data Loader workbook.

Note: Worksheets in the workbook not being used may be left blank, but should not be deleted from the workbook.

Worksheet	Description
Configuration	The **Configuration** worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
TaxonomyCategory	This worksheet is used to link Taxonomy Category data and Taxonomy Class data.
TaxonomyClass	This worksheet is used to link Taxonomy Class data and Taxonomy Type data.
TaxonomyMapping	This worksheet is used to link Taxonomy Type data and Taxonomy Mapping data.

Configuration Worksheet

The **Configuration** worksheet tells the data loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the **Configuration** worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will *not* be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE		The value is this column should be *Entity* or *Relationship* depending on the type of data that is being loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Family ID	PRED_ FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_ FAMILY_KEY_ FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_ INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_ FAMILY_ID	Character	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Field Caption	Field ID	Data Type (Length)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is *Entity*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE

Field Caption	Field ID	Data Type (Length)	Comments
Insert with Null Values?	OPTION_ INSERT_ON_ NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_ UPDATE_ON_ NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Replace an Existing Link?	OPTION_ REPLACE_ EXISTING_ LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship *Location Contains Asset* that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.

Field Caption	Field ID	Data Type (Length)	Comments
Allow Change of Family?	OPTION_ ALLOW_ CHANGE_OF_ FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

TaxonomyCategory

Note: Each row in this worksheet represents a *single* asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Category	SC_TAXOCATG_ TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Category Description	SC_TAXOCATG_ TAX_CATEG_ DESC_C	Character (255)	None

TaxonomyClass

Note: Each row in this worksheet represents a *single* asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Category	SC_TAXOCATG_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Class	SC_TAXOCLAS_TAX_CLASS_C	Character (50)	This is a key field.
Taxonomy Class Description	'SC_TAXOCLAS_TAX_CLASS_DESC_C	Character (255)	None

TaxonomyType

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Category	SC_TAXOCATG_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Class	SC_TAXOCLAS_TAX_CLASS_C	Character (50)	This is a key field.
Taxonomy Type	SC_TAXOTYPE_TAX_TYPE_C	Character (50)	This is a key field.
Taxonomy Type Description	SC_TAXOTYPE_TAX_TYPE_DESC_C	Character (255)	None

TaxonomyMapping Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Taxonomy Mapping Category	SC_TAXOMAPP_TAX_CATEG_C	Character (50)	This column is used for batching.
Taxonomy Mapping Class	SC_TAXOMAPP_TAX_CLASS_C	Character (50)	This is a key field.
Taxonomy Mapping Type	SC_TAXOMAPP_TAX_TYPE_C	Character (50)	This is a key field.
Taxonomy Mapping Value	SC_TAXOMAPP_TAX_MAPPI_VALUE_C	Character (255)	This is a key field.

About the Work History Data Loader

The Work History Data Loader allows a user to load historical work order data from an Excel workbook. The loader will create the necessary work history and work history detail records and link them to the corresponding equipment or functional location records as defined in the Excel workbook.

About the Work History Data Loader Requirements

The following data must be present prior to loading Work History data:

- Equipment Taxonomy.
- Equipment and Functional Location families.

Mapping

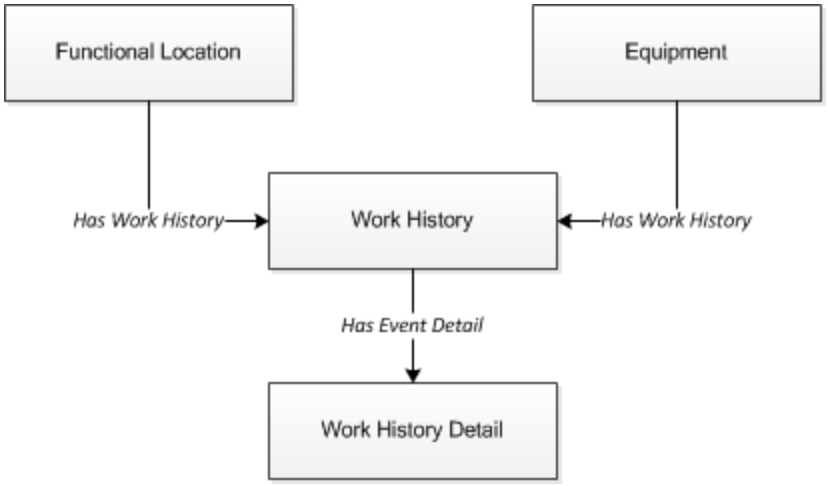
The Work History Data Loadermaps the datasheet columns in the Excel workbook to fields in GE Digital APM families by position. The captions may be changed as needed, but the column positions should not be moved.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

About the Work History Data Loader Data Model

The data for Work History and Work History detail families is loaded from a single Excel workbook containing a single worksheet. This includes Work History and Work History Detail.



Relationships:

- The Work History records are linked to Equipment and/or Functional Location records via the relationship *Has Work History* [MIR_HSWKHST].
- The Work History Detail records will be related to the appropriate Work History records via the relationship family *Has Event Detail* [MIR_EVNTDET].

About the Work History Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, refer to the Data Model section.

Load Sequence

The Work History and Work History Detail data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records:

1. Create or Update the Work History record.
2. Link the Work History record to the Asset ID (Equipment or Functional Location).
3. Create or Update the Work History Detail record.
4. Link the Work History Detail record to the associated Work History record.

Note: There can be multiple Work History Detail records for each Work History record.

About the Work History Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Work History Data Loader, GE Digital provides an Excel workbook, **Work History.xlsx**, which supports baseline data loading of work history and work history detail records in GE Digital APM. This workbook must be used to perform the data load.

Note: Worksheets in the workbook not being used may be left blank, but should not be deleted from the workbook.

The following table lists the worksheets that are included in the Foundation Work History Data Loader workbook.

Worksheet	Description
Configuration	The **Configuration** worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
WorkHistory	This worksheet is used to specify data for import to the Work History family.
WorkHistoryToWHDetails	This worksheet is used to specify data for import to the Work History Detail family.
WorkHistoryToEquipment	This worksheet is used to link Work History to Equipment records.
WorkHistoryToFLOCs	This worksheet is used to link Work History to Functional Location records.

Configuration Worksheet

The **Configuration** worksheet tells the Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the **Configuration** worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	Identifies if data from the corresponding worksheet identified in the **Data Worksheet ID** column will be loaded or not. • True: The corresponding worksheet will be processed. • False: The corresponding worksheet will *not* be processed.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the Meridium, Inc. metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE		The value is this column should be *Entity* or *Relationship* depending on the type of data that is being loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Family ID	PRED_ FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_ FAMILY_KEY_ FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_ INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_ FAMILY_ID	Character	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Field Caption	Field ID	Data Type (Length)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is *Entity*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE

Field Caption	Field ID	Data Type (Length)	Comments
Insert with Null Values?	OPTION_ INSERT_ON_ NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_ UPDATE_ON_ NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Replace an Existing Link?	OPTION_ REPLACE_ EXISTING_ LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship *Location Contains Asset* that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.

Field Caption	Field ID	Data Type (Length)	Comments
Allow Change of Family?	OPTION_ ALLOW_ CHANGE_OF_ FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

WorkHistory

Field ID	Filed Caption	Data Type (Length)	Comments
Event ID	MI_EVENT_ID	Character (255)	Generated by the system, and is not loaded.
CMMS System	MI_EVWKHIST_SAP_ SYSTEM_C	Character (50)	None
Equipment ID	MI_EVENT_ASST_ID_ CHR	Character (255)	Used as unique key to find equipment.
Asset Tech ID	MI_EVWKHIST_ ASST_TECH_ID_C	Character (255)	None
Location ID	MI_EVENT_LOC_ID_ CHR	Character (255)	Is a key field, and is used to find Functional Location.

Field ID	Filed Caption	Data Type (Length)	Comments
Activity Cause	MI_EVWKHIST_ ACTIV_CAUSE_C	Character (255)	None
Activity Cause Description	MI_EVWKHIST_ ACTIV_CAUSE_DESC_ C	Character (255)	None
Activity Type	MI_EVWKHIST_ ORDR_PM_ACT_C	Character (50)	None
Activity Type Description	MI_EVWKHIST_ ORDR_PM_ACT_ DESC_C	Character (255)	None
Breakdown Indic-ator	MI_EVWKHIST_ BRKDN_IND_F	Boolean	None
Detection Method Code	MI_EVWKHIST_ DETCT_MTHD_CD_C	Character (50)	None
Detection Method Description	MI_EVWKHIST_ DETCT_MTHD_ DESC_C	Character (255)	None
Effect Code	MI_EVWKHIST_ EFFCT_CD_C	Character (50)	None
Effect Description	MI_EVWKHIST_ EFFCT_DESC_C	Character (50)	None
Event Date Descrip-tion	MI_EVWKHIST_ EVENT_DATE_DESC_ C	Character (255)	None
Event Long Descrip-tion	MI_EVENT_LNG_ DSC_TX	Text	None
Event Short Description	MI_EVENT_SHRT_ DSC_CHR	Character (255)	None
Event Start Date	MI_EVENT_STRT_DT	Date	None

Field ID	Filed Caption	Data Type (Length)	Comments
Event Status	MI_EVWKHIST_STATUS_C	Character (50)	None
Event Type	MI_EVENT_TYP_CHR	Character (255)	None
Failure Mode Code	MI_EVWKHIST_FAILR_MODE_CD_C	Character (50)	None
Failure Mode Description	MI_EVWKHIST_FAILR_MODE_DESC_C	Character (255)	None
Failure Remarks	MI_EVWKHIST_FAILURE_REM_T	Text	None
Functional Loss Code	MI_EVWKHIST_FNCTNL_LOSS_CD_C	Character (50)	None
Functional Loss Description	MI_EVWKHIST_FNCTNL_LOSS_DESC_C	Character (50)	None
Maintenance Completion Date	MI_EVWKHIST_MAINT_COMPL_D	Date	None
Maintenance Cost UOM	MI_EVWKHIST_MAINT_CST_UOM_C	Character (10)	None
Maintenance Cost	MI_EVWKHIST_MAINT_CST_N	Numeric	None
Maintenance Start Date	MI_EVWKHIST_MAINT_START_D	Date	None
Mechanical Down Time	MI_EVWKHIST_MECH_DWN_TIME_N	Numeric	Calculated by system.
Mechanically Available Date	MI_EVWKHIST_MECH_AVAIL_D	Date	None

Field ID	Filed Caption	Data Type (Length)	Comments
Mechanically Unavailable Date	MI_EVWKHIST_ MECH_UNAVL_D	Date	None
Order Creation Date	MI_EVWKHIST_ ORDR_CRT_DT_D	Date	None
Order Description	MI_EVWKHIST_ ORDR_DESC_C	Character (255)	None
Order ID	MI_EVWKHIST_ ORDR_ID_C	Character (50)	None
Order Main-tenance Plan	MI_EVWKHIST_ ORDR_MAINT_ PLAN_C	Character (50)	None
Order Priority	MI_EVWKHIST_ ORDR_PRTY_C	Character (50)	None
Order Priority Description	MI_EVWKHIST_ ORDR_PRTY_DESC_C	Character (255)	None
Order Reference Date	MI_EVWKHIST_ ORDR_REF_DT_D	Date	None
Order System Condition	MI_EVWKHIST_ ORDR_SYS_COND_C	Character (50)	None
Order System Condition Descrip-tion	MI_EVWKHIST_ ORDR_SYS_CND_ DES_C	Character (255)	None
Order System Status	MI_EVWKHIST_ ORDR_SYS_STAT_C	Character (255)	None
Order Type Code	MI_EVWKHIST_ ORDR_TYP_CD_C	Character (50)	None
Order Type Description	MI_EVWKHIST_ ORDR_TYP_DESC_C	Character (50)	None

Field ID	Filed Caption	Data Type (Length)	Comments
Order User Status	MI_EVWKHIST_ ORDR_USER_STAT_C	Character (255)	None
PM Number	MI_EVWKHIST_PM_ NBR_C	Character (255)	None
Production Cost	MI_EVWKHIST_ PRDN_CST_N	Numeric	None
Request ID	MI_EVWKHIST_ RQST_ID_C	Character (50)	None
Request Creation Date	MI_EVWKHIST_ RQST_CRT_DT_D	Date	None
Request Descrip-tion	MI_EVWKHIST_ RQST_DESC_C	Character (255)	None
Request Priority	MI_EVWKHIST_ RQST_PRTY_C	Character (50)	None
Request Priority Description	MI_EVWKHIST_ RQST_PRTY_DESC_C	Character (255)	None
Request System Status	MI_EVWKHIST_ RQST_SYS_STAT_C	Character (255)	None
Request Type Code	MI_EVWKHIST_ RQST_TYP_CD_C	Character (50)	None
Request Type Description	MI_EVWKHIST_ RQST_TYP_DESC_C	Character (255)	None
Request User Status	MI_EVWKHIST_ RQST_USER_STAT_C	Character (255)	None
Scheduled Com-pletion Date	MI_EVWKHIST_ SCHED_COMPL_D	Date	None
Scheduled Start Date	MI_EVWKHIST_ SCHED_START_D	Date	None

Field ID	Filed Caption	Data Type (Length)	Comments
Target Completion Date	MI_EVWKHIST_ TARGET_COMPL_D	Date	None
Target Start Date	MI_EVWKHIST_ TARGET_START_D	Date	None
Work History Type	MI_EVWKHIST_ WORK_HIST_TYPE_C	Character (50)	None
Work Order Pri-ority	MI_EVWKHIST_WO_ PRIORTY_N	Numeric	None
Site Reference Name	MI_SITE_NAME	Character (50)	None

WorkHistoryToWHDetails Worksheet

On the WorkHistoryToWHDetails worksheet, you will find work history and work history detail fields.

Note: Each row in this worksheet represents a *unique* record. You should not include the same asset more than once.

Field ID	Field Caption	Data Type (Length)	Comments
Event ID	MI_EVWKHIST|MI_EVENT_ID	Character (255)	Generated by the sys-tem, and is not loaded.
CMMS System	MI_EVWKHIST|MI_EVWKHIST_ SAP_SYSTEM_C	Character (50)	None
Work Detail History ID	MI_DTWKHIST|MI_DTWKHIST_ EVNT_DTL_ID_C	Character (50)	None
CMMS System	'MI_DTWKHIST|MI_DTWKHIST_ SAP_SYSTEM_C	Character (50)	None

Work History ID	MI_DTWKHIST|MI_DTWKHIST_EVNT_DTL_ID_C	Character (50)	None
Work History Detail Description	MI_DTWKHIST|MI_DTWKHIST_EVNT_DTL_DESC_C	Character (255)	None
Order ID	MI_DTWKHIST|MI_DTWKHIST_ORDR_ID_C	Character (50)	None
Request ID	MI_DTWKHIST|MI_DTWKHIST_RQST_ID_C	Character (50)	Request ID from the associated order ID on the WH record, if not work order.
Cause Code	MI_DTWKHIST|MI_DTWKHIST_CAUSE_CD_C	Character (50)	None
Cause Description	'MI_DTWKHIST|MI_DTWKHIST_CAUSE_DESC_C	Character (255)	None
Condition Code	MI_DTWKHIST|MI_DTWKHIST_CNDTN_CD_C	Character (20)	None
Condition Description	MI_DTWKHIST|MI_DTWKHIST_CNDTN_DESC_C	Character (255)	None
Detail Narrative	MI_DTWKHIST|MI_DTWKHIST_DTL_NARTV_T	Text	None
Maintainable Item Code	MI_DTWKHIST|MI_DTWKHIST_MAINT_ITEM_CD_C	Character (50)	None
Maintainable Item Description	MI_DTWKHIST|MI_DTWKHIST_MAINT_ITEM_DESC_C	Character (255)	None
Maintenance Action Code	MI_DTWKHIST|MI_DTWKHIST_MAINT_ACTN_CD_C	Character (50)	None
Maintenance Action Description	MI_DTWKHIST|MI_DTWKHIST_MAINT_ACTN_DESC_C	Character (255)	None

Equipment ID	MI_DTWKHIST|MI_DTWKHIST_ASST_ID_C	Character (50)	None
Functional Location ID	MI_DTWKHIST|MI_DTWKHIST_LOC_ID_C	Character (50)	None
Site Reference Name	MI_DTWKHIST|MI_SITE_NAME	Character (50)	None

WorkHistoryToEquipment Worksheet

Field ID	Filed Caption	Data Type (Length)	Comments
Event ID	MI_EVWKHIST|MI_EVENT_ID	Character (255)	None
CMMS System	'MI_EVWKHIST|MI_EVWKHIST_SAP_SYSTEM_C	Character (50)	None
Equipment ID	'MI_EQUIP000|MI_EQUIP000_EQUIP_ID_C	Character (50)	None
CMMS System	'MI_EQUIP000|MI_EQUIP000_SAP_SYSTEM_C	Character (50)	None

WorkHistoryToFLOCs Worksheet

Field ID	Filed Caption	Data Type (Length)	Comments
Event ID	MI_EVWKHIST|MI_EVENT_ID	Character (255)	None
CMMS System	'MI_EVWKHIST|MI_EVWKHIST_SAP_SYSTEM_C	Character (50)	None
Functional Location Internal	'MI_FNCLOC00|MI_FNCLOC00_INTERNAL_ID_C	Character (50)	None
CMMS System	'MI_FNCLOC00|MI_FNCLOC00_SAP_SYSTEM_C	Character (50)	None

About the Work History Data Loader Load Verification

The query below can be used in any GE Digital APM database to populate an Excel format with the required data fields.

Work History Data Query

```
SELECT 'Customer Event Id' "Customer Event Id", [MI_EVWKHIST].[MI_EVENT_ID]
"Event ID", [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] "Equipment ID",
[MI_EQUIP000].[MI_EQUIP000_EQUIP_TECH_NBR_C] "Equipment Technical Number",
[MI_FNCLOC00].[MI_FNCLOC00_FNC_LOC_C] "Functional Location",
[MI_EVWKHIST].[MI_EVWKHIST_SAP_SYSTEM_C] "CMMS System",
[MI_EVWKHIST].[MI_EVWKHIST_ACTIV_CAUSE_C] "Activity Cause",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_PM_ACT_DESC_C] "Activity Type Description",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_PM_ACT_C] "Activity Type",
[MI_EVWKHIST].[MI_EVWKHIST_BRKDN_IND_F] "Breakdown Indicator",
[MI_EVWKHIST].[MI_EVWKHIST_DETCT_MTHD_CD_C] "Detection Method Code",
[MI_EVWKHIST].[MI_EVWKHIST_DETCT_MTHD_DESC_C] "Detection Method Description",
[MI_EVWKHIST].[MI_EVWKHIST_EFFCT_CD_C] "Effect Code",
[MI_EVWKHIST].[MI_EVWKHIST_EFFCT_DESC_C] "Effect Description",
[MI_EVWKHIST].[MI_EVWKHIST_EVENT_DATE_DESC_C] "Event Date Description",
[MI_EVWKHIST].[MI_EVENT_LNG_DSC_TX] "Event Long Description",
[MI_EVWKHIST].[MI_EVENT_SHRT_DSC_CHR] "Event Short Description",
[MI_EVWKHIST].[MI_EVENT_STRT_DT] "Event Start Date",
[MI_EVWKHIST].[MI_EVWKHIST_STATUS_C] "Event Status",
[MI_EVWKHIST].[MI_EVENT_TYP_CHR] "Event Type",
[MI_EVWKHIST].[MI_EVWKHIST_FAILR_MODE_CD_C] "Failure Mode Code",
[MI_EVWKHIST].[MI_EVWKHIST_FAILR_MODE_DESC_C] "Failure Mode Description",
[MI_EVWKHIST].[MI_EVWKHIST_FAILURE_REM_T] "Failure Remarks",
[MI_EVWKHIST].[MI_EVWKHIST_FNCTNL_LOSS_CD_C] "Functional Loss Code",
[MI_EVWKHIST].[MI_EVWKHIST_FNCTNL_LOSS_DESC_C] "Functional Loss Description",
[MI_EVWKHIST].[MI_EVWKHIST_MAINT_COMPL_D] "Maintenance Completion Date",
[MI_EVWKHIST].[MI_EVWKHIST_MAINT_CST_UOM_C] "Maintenance Cost UOM",
[MI_EVWKHIST].[MI_EVWKHIST_MAINT_CST_N] "Maintenance Cost",
[MI_EVWKHIST].[MI_EVWKHIST_MAINT_START_D] "Maintenance Start Date",
[MI_EVWKHIST].[MI_EVWKHIST_MECH_DWN_TIME_N] "Mechanical Down Time",
[MI_EVWKHIST].[MI_EVWKHIST_MECH_AVAIL_D] "Mechanically Available Date",
[MI_EVWKHIST].[MI_EVWKHIST_MECH_UNAVL_D] "Mechanically Unavailable Da",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_CRT_DT_D] "Order Creation Date",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_DESC_C] "Order Description",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_ID_C] "Order ID",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_MAINT_PLAN_C] "Order Maintenance Plan",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_PRTY_DESC_C] "Order Priority Description",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_PRTY_C] "Order Priority",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_REF_DT_D] "Order Reference Date",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_SYS_CND_DES_C] "Order System Condition Desc",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_SYS_COND_C] "Order System Condition",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_SYS_STAT_C] "Order System Status",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_TYP_CD_C] "Order Type Code",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_TYP_DESC_C] "Order Type Description",
[MI_EVWKHIST].[MI_EVWKHIST_ORDR_USER_STAT_C] "Order User Status",
[MI_EVWKHIST].[MI_EVWKHIST_PM_NBR_C] "PM Number",
[MI_EVWKHIST].[MI_EVWKHIST_PRDN_CST_N] "Production Cost",
```



```
[MI_EVWKHIST].[MI_EVWKHIST_RQST_ID_C] "Request ID",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_CRT_DT_D] "Request Creation Date",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_DESC_C] "Request Description",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_PRTY_DESC_C] "Request Priority Descriptio",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_PRTY_C] "Request Priority",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_SYS_STAT_C] "Request System Status",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_TYP_CD_C] "Request Type Code",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_TYP_DESC_C] "Request Type Description",
[MI_EVWKHIST].[MI_EVWKHIST_RQST_USER_STAT_C] "Request User Status",
[MI_EVWKHIST].[MI_EVWKHIST_SCHED_COMPL_D] "Scheduled Completion Date",
[MI_EVWKHIST].[MI_EVWKHIST_SCHED_START_D] "Scheduled Start Date",
[MI_EVWKHIST].[MI_EVWKHIST_TARGET_COMPL_D] "Target Completion Date",
[MI_EVWKHIST].[MI_EVWKHIST_TARGET_START_D] "Target Start Date",
[MI_EVWKHIST].[MI_EVWKHIST_TIME_TO_REPR_N] "Time To Repair (TTR)",
[MI_EVWKHIST].[MI_EVWKHIST_TOTL_CST_N] "Total Cost",
[MI_EVWKHIST].[MI_EVWKHIST_WORK_HIST_TYPE_C] "Work History Type",
[MI_EVWKHIST].[MI_EVWKHIST_WO_PRIORTY_N] "Work Order Priority",
'WHD_Customer WHD ID' "WHD_Customer WHD ID", [MI_DTWKHIST].[MI_DTWKHIST_EVNT_DTL_ID_
C]
"WHD_Work History Detail ID", [MI_DTWKHIST].[MI_DTWKHIST_EVNT_DTL_DESC_C]
"WHD_Work Hist Detail Desc", [MI_DTWKHIST].[MI_DTWKHIST_ORDR_ID_C]
"WHD_Order ID", [MI_DTWKHIST].[MI_DTWKHIST_RQST_ID_C] "WHD_Request ID",
[MI_DTWKHIST].[MI_DTWKHIST_CAUSE_CD_C] "WHD_Cause Code",
[MI_DTWKHIST].[MI_DTWKHIST_CAUSE_DESC_C] "WHD_Cause Description",
[MI_DTWKHIST].[MI_DTWKHIST_CNDTN_CD_C] "WHD_Condition Code",
[MI_DTWKHIST].[MI_DTWKHIST_CNDTN_DESC_C] "WHD_Condition Description",
[MI_DTWKHIST].[MI_DTWKHIST_DTL_NARTV_T] "WHD_Detail Narrative",
[MI_DTWKHIST].[MI_DTWKHIST_MAINT_ITEM_CD_C] "WHD_Maintainable Item Code",
[MI_DTWKHIST].[MI_DTWKHIST_MAINT_ITEM_DESC_C] "WHD_Maintainable Item Desc",
[MI_DTWKHIST].[MI_DTWKHIST_MAINT_ACTN_CD_C] "WHD_Maintenance Action Code",
[MI_DTWKHIST].[MI_DTWKHIST_MAINT_ACTN_DESC_C] "WHD_Maintenance Action Desc"
FROM [MI_EVWKHIST] JOIN_PRED [MI_EQUIP000] JOIN_PRED [MI_FNCLOC00]
ON {MIR_FLHSEQ} ON {MIR_HSWKHST} JOIN_SUCC [MI_DTWKHIST] ON {MIR_EVNTDET}
```


About the APM Failure Elimination Data Loaders

This topic provides a listing of all the APM Failure Elimination Data Loaders.

About the Production Loss Analysis (PLA) Data Loaders

The Production Loss Analysis (PLA) Data Loaders allow you to load the production data that exists in a legacy system into GE Digital APM. By loading the legacy production data, you can gain insight into previous performance and compare it to current and future performance. Using the data loaded by the PLA Data Loaders, you can maintain visibility and continuity in production reliability.

The PLA Data Loaders can also be used to:

- Validate solution readiness by performing functional tests on loaded data elements.
- Enable effective training for a specific course by using loaded data elements.

GE Digital APM uses the following Data Loaders in PLA:

- Production Loss Analysis (PLA) 1-Admin
- Production Loss Analysis (PLA) 2-Event
- Production Loss Analysis (PLA) 3-Plan

Each PLA Data Loader uses an Excel workbook, which is referred to as the data loader workbook.

About the Production Loss Analysis (PLA) 1-Admin Data Loader

Using the Production Loss Analysis (PLA) 1-Admin Data Loader, you can create the following records:

- Production Units
- Production Event Codes
- Production Profiles
- Profile Margins

About the Production Loss Analysis (PLA) 1-Admin Data Loader Requirements

Before you use the Production Loss Analysis (PLA) 1-Admin Data Loader:

- Ensure that the Production Event Codes specified in the data loader workbook exist in GE Digital APM.
- If a Functional Location is specified in the data loader workbook, ensure that it exists in GE Digital APM.

  ⚠**IMPORTANT:** To use this data loader, the Functional Location family must use the baseline format of the ID Template.

Security Settings

The user who loads data must be associated with the following Security Groups and Security Roles:

- MI Data Loader User Security Role

  -or-

  MI Data Loader Admin Security Role

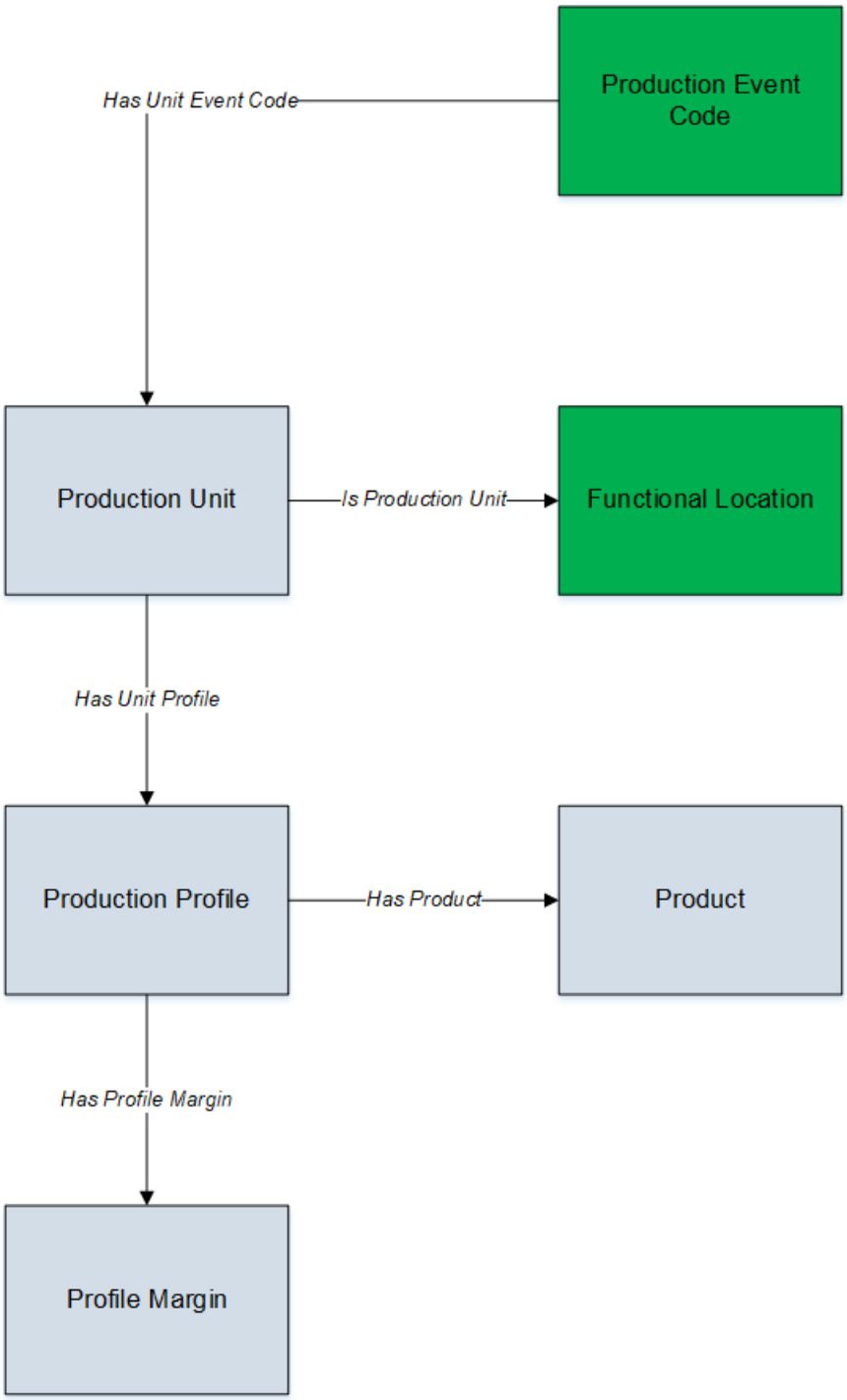
- MI Production Loss Accounting Administrator Security Group

  -or-

  A role that is associated with the MI Production Loss Accounting Administrator Security Group

About the Production Loss Analysis (PLA) 1-Admin Data Loader Data Model

The following data model illustrates which records are supported by the Production Loss Analysis (PLA) 1-Admin Data Loader:



- Elements shown in grey are imported into GE Digital APM by the Production Loss Analysis (PLA) 1-Admin Data Loader.
- Elements shown in green exist in GE Digital APM and may be related to the data that is being loaded.

About the Production Loss Analysis (PLA) 1-Admin Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Best Practices

When using the Production Loss Analysis (PLA) 1-Admin data loader workbook, ensure that:

- The ID fields (for example, row 2) in each worksheet do not include special characters or spaces.
- Columns of each worksheet, including those representing custom fields, are not formatted as Text.
- The first two rows of each worksheet are not modified.

Modification Requirements and Guidelines

To accommodate a new or an enhanced feature, GE Digital APM may modify the data model from one version to the next. In this scenario, the data loaders will be modified and maintained by GE Digital APM between releases.

Limitations

- If you reimport a record that currently exists in GE Digital APM, the newly imported record will replace the existing one in GE Digital APM. The Production Loss Analysis (PLA) 1-Admin Data Loader does not create a duplicate record.
- You must not modify the template of the data loader workbook.

Load Sequence

1. Download the following data loader workbooks provided by GE Digital APM:
    - Production Loss Analysis (PLA) 1-Admin
    - Production Loss Analysis (PLA) 2-Event
    - Production Loss Analysis (PLA) 3-Plan
2. Identify the data requirements for exporting data from the legacy system into the data loader workbooks.
3. Extract data from the legacy system to populate the data loader workbooks.
4. Load data using the Production Loss Analysis (PLA) 1-Admin data loader workbook.
5. Monitor the status of the data load operation and report results.

6. Conduct tests in GE Digital APM to ensure that the imported data is loaded properly.

About the Production Loss Analysis (PLA) 1-Admin Data Loader Workbook Layout and Use

To load data using the Production Loss Analysis (PLA) 1-Admin Data Loader, GE Digital APM provides an Excel workbook, **Production Loss Analysis (PLA) 1-Admin.xlsx**, which supports baseline PLA in GE Digital APM.

The following table provides a list of worksheets that are included in the Production Loss Analysis (PLA) 1-Admin data loader workbook:

Worksheet	Description
ProductionUnit	This worksheet is used to specify the Production Unit records.
ProductionEventCode	This worksheet is used to specify the existing Production Event Code records that have been assigned to the Production Unit records.
ProductionProfile	This worksheet is used to specify the Production Profile records.
ProfileMargin	This worksheet is used to specify the Profile Margin records.

Color Coding

Certain columns in the worksheets have different functions and requirements. To illustrate this, they are color-coded. The following table lists the colors and what they represent:

Color	Description	Comments
	Required Fields	Indicates columns that contain values that are required in PLA.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for PLA, should contain values.
	Optional	Indicates columns where you can specify custom fields.

ProductionUnit Worksheet

Production Unit records store basic information about a single Production Unit. In the ProductionUnit worksheet, you will specify the Production Unit records that you want to create.

Field Caption	Field ID	Data Type (Length)	Comments
Production Unit Key	MI_PRDNUNIT_KEY	Character (255)	Enter a unique value that you want to assign to each Production Unit. Other worksheets within the workbook can reference the Production Unit using this value.
Production Unit Name	MI_PRDNUNIT_UNIT_ID_C	Character (255)	Enter a unique value. The name of the Production Unit is case-sensitive.
Production Unit Description	MI_PRDNUNIT_DESCR_C	Character (255)	This cell is optional.
Associated Unit	MI_PRDNUNIT_FUNC_LOC_C	Character (255)	The value you enter in this cell must match the ID of an existing Functional Location (Family ID: MI_FNCLOC00) in GE Digital APM.
TimeZone	MI_PRDNUNIT_TIMEZONE_C	Character (255)	Enter a valid time zone (e.g., Eastern Standard Time).

ProductionEventCode Worksheet

In the ProductionEventCode worksheet, you will specify the Production Event Codes that you want to associate with your Production Unit records.

Field Caption	Field ID	Data Type (Length)	Comments
Production Unit Key	MI_PRDNUNIT_KEY	Character (255)	Enter the key that is assigned to the Production Unit that you want to reference. The ProductionUnit worksheet contains this value.

Field Caption	Field ID	Data Type (Length)	Comments
Event Code	MI_PRDEVNCD_CODE_C	Character (50)	The value you enter in this cell is mapped to the corresponding Production Unit. This value must exist in the **Codes** workspace on the **PLA Administrator** page.

ProductionProfile Worksheet

Production Profile records store information about a Product. In the Production Profile worksheet, you will specify the Production Profile records that you want to create.

Field Caption	Field ID	Data Type (Length)	Comments
Production Unit Key	MI_PRDNUNIT_KEY	Character (255)	Enter the key that is assigned to the Production Unit that you want to reference. The ProductionUnit worksheet contains this value.
Profile Key	MI_PRDNPROF_KEY	Character (255)	Enter a unique value.
Production Profile Description	MI_PRDNPROF_DESCR_C	Character (255)	This cell is optional.
Product Name	MI_PRODUCT_NAME_C	Character (50)	The value you enter in this cell is used to form the name of the Production Profile. If the entered Product Name does not exist in GE Digital APM, the Product Name and the Product Description will be used to create the Product.

Field Caption	Field ID	Data Type (Length)	Comments
Product Alias	MI_PRDNPROF_ALTE_PROD_NAME_C	Character (50)	This cell is optional. If a value is not entered in this cell, it will be populated with the Product Name of the Production Profile.
Product Description	MI_PRODUCT_DESCR_C	Character (255)	This cell is optional.
Max Demonstrated Rate	MI_PRDNPROF_MAX_DMNSTR_RATE_N	Numeric	Enter the maximum demonstrated production rate. Max Demonstrated Rate (MDR) defines the practical limit for Maximum Sustained Capacity Rate (MSCR). It is measured in terms of Product UOM per Production Rate UOM (e.g., 500 Barrels/Day).
Product UOM	MI_PRDNPROF_PRODUCT_UOM_C	Character (255)	The value you enter in this cell is used to form the name of the Production Profile. Unit is the default Product UOM. If the entered UOM does not exist in GE Digital APM, it will be added to GE Digital APM.
Production Rate UOM	MI_PRDNPROF_PRO_RATE_UOM_C	Character (255)	Enter the required Unit of Measure (UOM) which defines the unit used for batch cycle time, production planning, and reporting rates.
Standard Batch Cycle Time	MI_PRDNPROF_ST_BA_CY_TI_N	Numeric	Enter the cycle time that is used to calculate capacity and planning rates. It is measured in terms of Production Rate UOM (e.g., 1 Day).

Field Caption	Field ID	Data Type (Length)	Comments
Standard Batch Size	MI_PRDNPROF_STAN_BAT_SIZ_N	Numeric	Enter the batch size that is used to calculate capacity and planning rates. It is measured in terms of Product UOM (e.g., 5 Barrels).
Planning Rate	MI_PRDNPROF_PLAN_RATE_N	Numeric	Enter the rate associated with the useful production time. It is measured in terms of Product UOM per Production Rate UOM (e.g., 300 Barrels/Day).
Profile MSHR	MI_PRDNPROF_MAX_SUS_HO_RA_MS_N	Numeric	Enter the Maximum Sustained Hourly Rate for Production. If a value is not entered in this cell, Equivalent Downtime Hours will not be calculated on Production Losses. It is measured in terms of Product UOM (e.g., 50 Barrels).

ProfileMargin Worksheet

Every Production Profile must have at least one Profile Margin. In the ProfileMargin worksheet, you will specify the Profile Margin records that you want to create for a Production Profile.

Note: If there is more than one Profile Margin for a Production Profile, one of the Profile Margins must be marked as default. If no Profile Margin is provided for a Production Profile, the Loss value will not be calculated.

Field Caption	Field ID	Data Type (Length)	Comments
Production Unit Key	MI_PRDNUNIT_KEY	Character (255)	Enter the key that is assigned to the Production Unit that you want to reference. The ProductionUnit worksheet contains this value.
Profile Key	MI_PRDNPROF_KEY	Character (255)	Enter the key that is assigned to the Production Unit that you want to reference. The ProductionProfile worksheet contains this value.

Field Caption	Field ID	Data Type (Length)	Comments
MarginKey	MI_MARGIN_KEY	Numeric	Enter a unique value.
Margin ID	MI_PROFMAR_MARGI_ID_C	Character (255)	Enter a unique value.
Margin Value	MI_PROFMAR_MARGI_VALUE_N	Numeric	Enter a value for the Margin.
Default (Yes/No)	MI_PROFMAR_SELE_DEFA_N	Numeric	Enter one of the following values: • 0: This will not mark the corresponding Profile Margin of the selected Production Profile as the default Profile Margin. • 1: This will mark the corresponding Profile Margin of the selected Production Profile as the default Profile Margin.

About the Production Loss Analysis (PLA) 1-Admin Data Loader Load Verification

A successful import is defined as an event where all the data in the data loader workbooks is loaded into GE Digital APM.

After loading the data successfully, you will be able to access the following records:

- Production Units
- Production Event Codes
- Production Profiles
- Profile Margins

A successful import can also be defined as an event in which, if partial data in the data loader workbook is loaded into GE Digital APM, an error message appears, which enables you to identify and correct issues with the data and continue loading the data.

>

About the Production Loss Analysis (PLA) 2-Event Data Loader

Using the Production Loss Analysis (PLA) 2-Event Data Loader, you can create the Production Event record.

About the Production Loss Analysis (PLA) 2-Event Data Loader Requirements

Before you use the Production Loss Analysis (PLA) 2-Event Data Loader:

- If the following details are specified in the data loader workbook, ensure that they exist in GE Digital APM:
  - Asset (Equipment or Functional Location)
  - Production Unit
  - Work History

  ⓘ **Tip:** You can use the Production Loss Analysis (PLA) 1-Admin Data Loader to create the Production Unit records in GE Digital APM.

  ⚠ **IMPORTANT:** To use this data loader, the Equipment and Functional Location families must use the baseline format of the ID Template.
- If a Production Event Code is specified in the data loader workbook for a Production Unit, ensure that it is associated with the same Production Unit in GE Digital APM.

Security Settings

The user who loads data must be associated with the following Security Groups and Security Roles:

- MI Data Loader User Security Role

  -or-

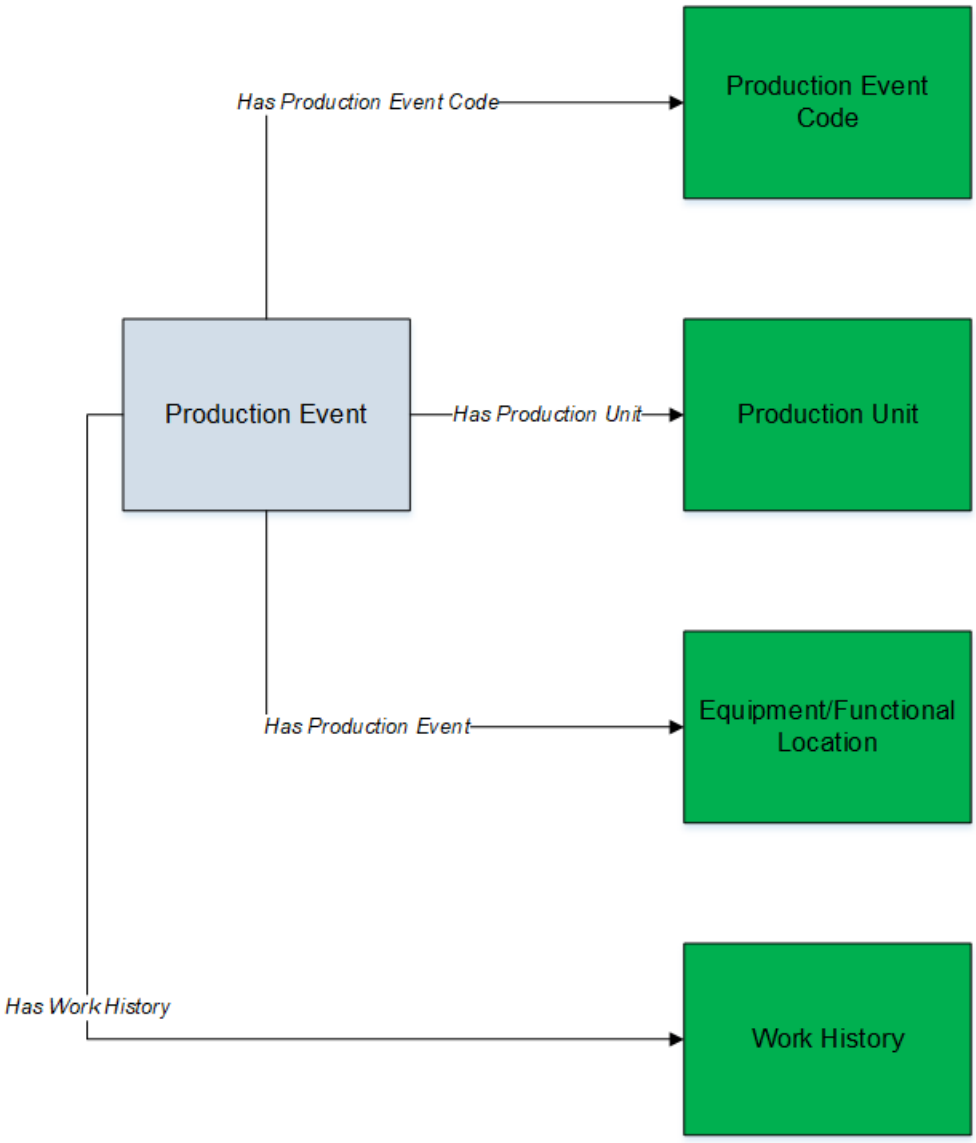
  MI Data Loader Admin Security Role
- MI Production Loss Accounting Administrator Security Group

  -or-

  A role that is associated with the MI Production Loss Accounting Administrator Security Group

About the Production Loss Analysis (PLA) 2-Event Data Loader Data Model

The following data model illustrates which records are supported by the Production Loss Analysis (PLA) 2-Event Data Loader:



- The element shown in grey is imported into GE Digital APM by the Production Loss Analysis (PLA) 2-Event Data Loader.
- Elements shown in green exist in GE Digital APM and may be related to the data that is being loaded.

About the Production Loss Analysis (PLA) 2-Event Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Best Practices

When using the Production Loss Analysis (PLA) 2-Event data loader workbook, ensure that:

- The ID fields (for example, row 2) in each worksheet do not include special characters or spaces.
- Columns of each worksheet, including those representing custom fields, are not formatted as Text.
- The first two rows of each worksheet are not modified.

Modification Requirements and Guidelines

To accommodate a new or an enhanced feature, GE Digital APM may modify the data model from one version to the next. In this scenario, the data loaders will be modified and maintained by GE Digital APM between releases.

Limitations

- If you reimport a record that currently exists in GE Digital APM, the newly imported record will replace the existing one in GE Digital APM. The Production Loss Analysis (PLA) 1-Admin Data Loader does not create a duplicate record.
- You must not modify the template of the data loader workbook.

Load Sequence

1. Download the following data loader workbooks provided by GE Digital APM:
    - Production Loss Analysis (PLA) 1-Admin
    - Production Loss Analysis (PLA) 2-Event
    - Production Loss Analysis (PLA) 3-Plan
2. Identify the data requirements for exporting data from the legacy system into the data loader workbooks.
3. Extract data from the legacy system to populate the data loader workbooks.
4. Load data using the Production Loss Analysis (PLA) 2-Event data loader workbook.
5. Monitor the status of the data load operation and report results.

6. Conduct tests in GE Digital APM to ensure that the imported data is loaded properly.

About the Production Loss Analysis (PLA) 2-Event Data Loader Workbook Layout and Use

To load data using the Production Loss Analysis (PLA) 2-Event Data Loader, GE Digital APM provides an Excel workbook, **Production Loss Analysis (PLA) 2-Event.xlsx**, which supports baseline PLA in GE Digital APM.

The following table provides a list of worksheets that are included in the Production Loss Analysis (PLA) 2-Event data loader workbook:

Worksheet	Description
ProductionEvent	This worksheet is used to specify the Production Event records.

Color Coding

Certain columns in the worksheets have different functions and requirements. To illustrate this, they are color-coded. The following table lists the colors and what they represent:

Color	Description	Comments
	Fields with Special Notes	Indicates columns that contain values that are used by the Production Loss Analysis (PLA) 2-Event Data Loader to create records. If these columns are removed from the worksheets, the data load operation will fail. While the worksheets require that these columns be present, values are not necessarily required in these columns.
	Required Fields	Indicates columns that contain values that are required in PLA.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for PLA, should contain values.
	Optional	Indicates columns where you can specify custom fields.

ProductionEvent Worksheet

In the ProductionEvent worksheet, you will specify the Production Event records that you want to create.

Field Caption	Field ID	Data Type (Length)	Comments
Event Id	MI_PRDNEVENT_ID_C	Character (250)	Enter a unique value.
Site Id	MI_SITE_ID	Character (255)	Enter the site ID where the Production Event occurred.
HeadLine	MI_PRDNEVNT_HEADLINE_C	Character (50)	Enter a short description of the Production Event.
Description	MI_PRDNEVNT_DESCR_C	Text	Enter a detailed description of the Production Event.
Start Date	MI_PRDNEVNT_START_DATE_D	Date	Enter the date and time when the Production Event started. The Start Date must represent the time zone of the Production Unit.
End Date	MI_PRDNEVNT_END_DATE_D	Date	Enter the date and time when the Production Event ended. The End Date must represent the time zone of the Production Unit.
Source Production Unit	MI_PRDNEVNT_SRC_UNIT_C	Character (50)	Enter the Production Unit to which the Production Loss is attributed.
Production Event Code	MI_PRDNEVNT_RLT_PRDNEVNT_CD_C	Character (50)	Enter a value that matches an existing Production Event Code in GE Digital APM.

Field Caption	Field ID	Data Type (Length)	Comments
Causing Asset Category	MI_PRDNEVNT_UserSelection	Character (50)	This cell is required if you specify a Causing Asset. Select the family (for example, Equipment or Family) of the Causing Asset. This cell is case-sensitive.
Causing Asset	MI_PRDNEVNT_RLT_CAUSE_EQP_C	Character (255)	Enter the Equipment or Functional Location to which you want to attribute the cost of the Production Event.
Work History Link	MI_PRDNEVNT_WRK_HIST_LNK_C	Character (255)	Enter one or more Work Histories that you want to link to the Production Event. The cost of each linked Work History is added to the total cost of the Production Loss.
Other Event Cost	MI_PRDNEVNT_OTHR_EVNT_COST_N	Numeric	Enter a value for the additional costs. It is measured in dollars.
Comment	MI_PRDNEVNT_COMMENT_C	Text	Enter a description of the event.

About the Production Loss Analysis (PLA) 2-Event Data Loader Load Verification

A successful import is defined as an event where all the data in the data loader workbooks is loaded into GE Digital APM.

After loading the data successfully, you will be able to access the Production Event records.

A successful import can also be defined as an event in which, if partial data on the data loader workbook is loaded into GE Digital APM, an error message appears, which enables you to identify and correct issues with the data and continue loading the data.

About the Production Loss Analysis (PLA) 3-Plan Data Loader

Using the Production Loss Analysis (PLA) 3-Plan Data Loader, you can create the following records:

- Production Plans
- Production Data
- Production Losses

About the Production Loss Analysis (PLA) 3-Plan Data Loader Requirements

If the following details are specified in the data loader workbook, ensure that they exist in GE Digital APM:

- Impact Code
- OEE Code
- Production Event
- Production Profile
- Production Unit

Tip: You can use the Production Loss Analysis (PLA) 1-Admin and Production Loss Analysis (PLA) 2-Event Data Loaders to create the Production Event, Production Profile, and Production Unit records. You must, however, load them in the following sequence:

- Production Loss Analysis (PLA) 1-Admin
- Production Loss Analysis (PLA) 2-Event

Security Settings

The user who loads data must be associated with the following Security Groups and Security Roles:

- MI Data Loader User Security Role

  -or-

  MI Data Loader Admin Security Role

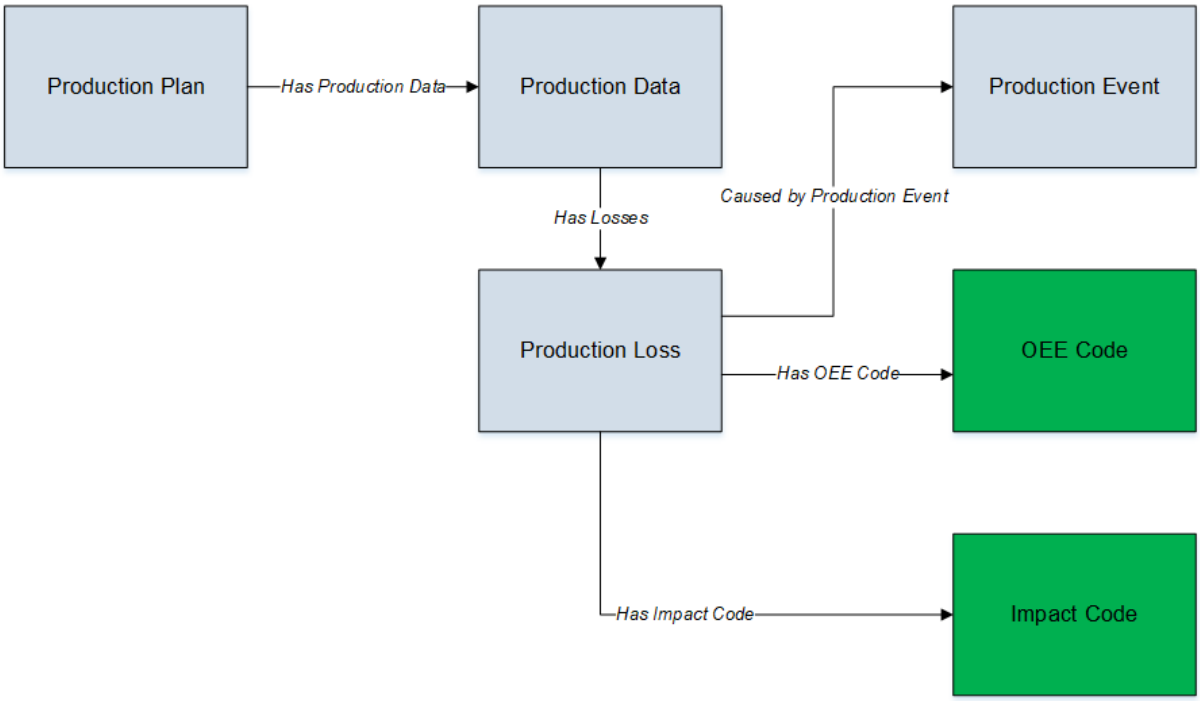
- MI Production Loss Accounting Administrator Security Group

  -or-

  A Security Role that is associated with the MI Production Loss Accounting Administrator Security Group

About the Production Loss Analysis (PLA) 3-Plan Data Loader Data Model

The following data model illustrates which records are supported by the Production Loss Analysis (PLA) 3-Plan Data Loader:



- Elements shown in grey are imported into GE Digital APM by the Production Loss Analysis (PLA) 3-Plan Data Loader.
- Elements shown in green exist in GE Digital APM and may be related to the data that is being loaded.

About the Production Loss Analysis (PLA) 3-Plan Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Best Practices

When using the Production Loss Analysis (PLA) 3-Plan data loader workbook, ensure that:

- The ID fields (for example, row 2) in each worksheet do not include special characters or spaces.
- Columns of each worksheet, including those representing custom fields, are not formatted as Text.
- The first two rows of each worksheet are not modified.

Modification Requirements and Guidelines

To accommodate a new or an enhanced feature, GE Digital APM may modify the data model from one version to the next. In this scenario, the data loaders will be modified and maintained by GE Digital APM between releases.

Limitations

- If you reimport a record that currently exists in GE Digital APM, the newly imported record will replace the existing one in GE Digital APM. The Production Loss Analysis (PLA) 1-Admin Data Loader does not create a duplicate record.
- You must not modify the template of the data loader workbook.

Load Sequence

1. Download the following data loader workbooks provided by GE Digital APM:
    - Production Loss Analysis (PLA) 1-Admin
    - Production Loss Analysis (PLA) 2-Event
    - Production Loss Analysis (PLA) 3-Plan
2. Identify the data requirements for exporting data from the legacy system into the data loader workbooks.
3. Extract data from the legacy system to populate the data loader workbooks.
4. Load data using the Production Loss Analysis (PLA) 3-Plan data loader workbook.
5. Monitor the status of the data load operation and report results.

6. Conduct tests in GE Digital APM to ensure that the imported data is loaded properly.

About the Production Loss Analysis (PLA) 3-Plan Data Loader Workbook Layout and Use

To load data using the Production Loss Analysis (PLA) 3-Plan Data Loader, GE Digital APM provides an Excel workbook, **Production Loss Analysis (PLA) 3-Plan.xlsx**, which supports baseline PLA in GE Digital APM.

The following table lists the worksheets that are included in the Production Loss Analysis (PLA) 2-Event data loader workbook:

Worksheet	Description
ProductionPlan	This worksheet is used to specify the Production Plan records.
PlanDetails	This worksheet is used to specify the Production Plan and Production Data records.
ProductionLoss	This worksheet is used to specify the Production Loss records.

Color Coding

Certain columns in the worksheets have different functions and requirements. To illustrate this, they are color-coded. The following table lists the colors and what they represent:

Color	Description	Comments
	Fields with Special Notes	Indicates columns that contain values that are used by the Production Loss Analysis (PLA) 3-Plan Data Loader to create records. If these columns are removed from the worksheets, the data load operation will fail. While the worksheets require that these columns be present, values are not necessarily required in these columns.
	Required Fields	Indicates columns that contain values that are required in PLA.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for PLA, should contain values.
	Optional	Indicates columns where you can specify custom fields.

ProductionPlan Worksheet

Production Plan records store information about the quantity of Product you plan to produce within a certain period. In the ProductionPlan worksheet, you will specify the Production Plan records that you want to create.

Field Caption	Field ID	Data Type (Length)	Comments
Plan Key	MI_PRDNPLAN_KEY	Character (255)	Enter a unique value.
Production Unit ID	MI_PRDNUNIT_Id	Character (255)	The name of the Production Unit is case-sensitive. Other worksheets within the work-book can reference the Production Unit using this value.

Field Caption	Field ID	Data Type (Length)	Comments
Profile IDs	MI_PRDNPROF_IDs	Character (255)	Based on the type of Production Plan, enter a value in one of the following formats: • For a quantity-based concurrent or sequential plan: <Value of Profile ID>~<Quantity of Product to be produced sequentially> (e.g., Diesel~100, Kerosene~200, Petrol~300) • For a time-based sequential plan: <Value of Profile ID>~<The date and time when the production of the Product ends> (e.g., Diesel~2015-04-28 00:00:00, Kerosene~ 2015-08-29 00:00:00, Petrol~2016-01-30 00:00:00) • For a manual plan or a time-based concurrent plan: <Value of Profile ID> (e.g., Diesel, Kerosene, Petrol) To specify multiple Profile IDs, separate them using commas .

Field Caption	Field ID	Data Type (Length)	Comments
Plan Basis (TimeOr QuantityOrManual)	MI_ PRDNPLAN_ PLAN_BASIS_C	Character (255)	Enter one of the following values: • T: To specify a time-based plan. • Q: To specify a quantity-based plan. • M: To specify a manual plan.
Data Entry Fre-quency	MI_ PRDNPLAN_ DATA_ENTR_ FREQ_C	Character (255)	Enter one of the following values: • Hour • Shift • Day • Week • Month • Quarter • Year • Campaign
Start Date	MI_ PRDNPLAN_ START_DATE_ D	Date	Enter a value in the following format: YYYY-DD-MM hh:mm:ss.
End Date	MI_ PRDNPLAN_ END_D	Date	Enter a value in the following format: YYYY-DD-MM hh:mm:ss. This value must be greater than the Start Date.
Production Model (SequentialOr Con-current)	MI_ PRDNPLAN_ PRODU_ MODEL_C	Character (255)	Enter one of the following values: • S: To specify a sequential plan. • C: To specify a concurrent or manual plan.

Field Caption	Field ID	Data Type (Length)	Comments
Shift Details (shift for one of the days is required)	Monday	Character (255)	Enter a value in the following format: hh:mm~hh:mm. For example, if the shift starts from 9:00 A.M. and ends at 5:00 P.M., enter the following value: 09:00~17:00. To specify multiple Shift Details, separate them using commas. For example, to specify two shifts from 9:00 A.M. to 1:00 A.M., you can enter 09:00~17:00, 17:00~01:00. Provide the Shift Details for at least one of the days in the week.
	Tuesday		
	Wednesday		
	Thursday		
	Friday		
	Saturday		
	Sunday		

PlanDetails Worksheet

In the PlanDetails worksheet, you will specify the plan details for the Production Plan and Production Data.

Field Caption	Field ID	Data Type (Length)	Comments
Plan Key	MI_PRDNPLAN_KEY	Character (255)	Enter the key that is assigned to the Production Plan that you want to reference. The ProductionPlan worksheet contains this value.
Production Unit ID	MI_PRDNUNIT_Id	Character (255)	Enter the ID that is assigned to the Production Unit that you want to reference. The ProductionPlan worksheet contains this value.

Field Caption	Field ID	Data Type (Length)	Comments
Production Profile ID	MI_PRDNPROF_ID	Character (50)	Enter the Product Alias Name.
Line Number	MI_PRDNDATA_PLAN_DETAIL_ID_N	Numeric	Enter a value that is unique within a Production Plan Key, Production Unit ID, and Production Profile ID.
Shift Start Date Time	MI_PRDNDATA_PERIOD_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss.
Shift End Date Time	MI_PRDNDATA_END_TIME_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss.
Planned Production	MI_PRDNDATA_USEF_PROD_TIME_N	Numeric	Enter the quantity of the product that is planned to be produced in the defined period. It is measured in terms of Product UOM (e.g., 50 Barrels).
Short Range Plan	MI_PRDNDATA_SHTRNG_PLAN_N	Numeric	Enter a short-range planning value if it is to be used as a baseline for losses. It is measured in terms of Product UOM (e.g., 50 Barrels).
Actual	MI_PRDNDATA_ACTUAL_N	Numeric	Enter the actual production recorded in the defined period. It is measured in terms of Product UOM (e.g., 50 Barrels).
MSCR	MI_PRDNDATA_RATED_N	Numeric	Enter the maximum sustained capacity rate. It is measured in terms of Product UOM per Production Rate UOM (e.g., 50 Barrels/Day).

Field Caption	Field ID	Data Type (Length)	Comments
MSHR	MI_PRDNDATA_MSHR_N	Numeric	Enter the Maximum Sustained Hourly Rate (MSHR) to be applied to losses to calculate Estimated Downtime Hours (EDT). If a value is not entered, the EDT field will appear blank in the corresponding Production Plan. It is measured in terms of Product UOM (e.g., 50 Barrels).

ProductionLoss Worksheet

Production Loss records store information about the loss of production caused by an event. In the ProductionLoss worksheet, you will specify the Production Loss records that you want to create.

Field Caption	Field ID	Data Type (Length)	Comments
Plan Key	MI_PRDNPLAN_KEY	Character (255)	Enter the key that is assigned to the Production Plan that you want to reference. The ProductionPlan worksheet contains this value.
Production Unit ID	MI_PRDNUNIT_Id	Character (255)	Enter the ID that is assigned to the Production Unit that you want to reference. The ProductionPlan worksheet contains this value.
Production Profile ID	MI_PRDNPROF_ID	Character (50)	Enter the Product Alias Name.
Line Number	MI_PRDNDATA_PLAN_DETAIL_ID_N	Numeric	Enter a value that is unique within a Production Plan Key, Production Unit ID, and Production Profile ID.

Field Caption	Field ID	Data Type (Length)	Comments
Impact Code	MI_PRDNLOSS_IMPACT_CODE_C	Character (255)	Enter a value that matches an existing Impact Code in GE Digital APM.
Loss Amount	MI_PRDNLOSS_LOSS_AMOUNT_N	Numeric	Enter the amount of losses incurred. It is measured in terms of dollars.
OEE Code	MI_PRDNLOSS_OEE_CODE_C	Character (255)	Enter a value that matches an existing OEE Code in GE Digital APM.
Comment	MI_PRDNLOSS_COMMENT_C	Character (255)	Enter a value to describe the loss.
Event Id	MI_PRDNLOSS_PRDN_EVENT_C	Character (250)	Enter the Event ID of the Production Event.
Margin Id	MI_MARGIN_ID	Character (50)	Enter the Margin ID of the Profile Margin.
EDT	MI_PRDNLOSS_EDT_N	Numeric	Enter the estimated downtime. It is measured in hours.

About the Production Loss Analysis (PLA) 3-Plan Data Loader Load Verification

A successful import is defined as an event where all the data in the data loader workbooks is loaded into GE Digital APM.

After loading the data successfully, you will be able to access the Production Event records.

In a successful import, all the calculations that are based on the imported data must be correct to the degree of accuracy specified in the **Settings** window on the **PLA Administrator** page.

A successful import can also be defined as an event in which, if partial data on the data loader workbook is loaded into GE Digital APM, an error message appears, which enables you to identify and correct issues with the data and continue loading the data.

About the Root Cause Analysis (RCA) Data Loader

The Root Cause Analysis (RCA) Data Loader allows both primary and third-party content to be delivered to GE Digital APM through either the RCA Data Model. The imported data can then be used to maintain relationships between the RCA data and the Failure Modes and Hypotheses. Users can deploy the data loader to import:

- Legacy analysis data for performance comparisons.
- Third-party template content.

The Root Cause Analysis (RCA) Data Loader transfers data from a fixed-format Excel workbook into either the RCA Data Model or the RCA Logic Tree. The imported data can be:

- An RCA Analysis.
- An RCA Event.
- A Failure Mode.
- A Logic Gate.
- An RCA Hypothesis.
- An RCA Diagram Relationship.

Note: The Root Cause Analysis (RCA) Data Loader will not be backwards compatible to earlier versions of GE Digital APM.

About the Root Cause Analysis (RCA) Data Loader Requirements

To use the Root Cause Analysis (RCA) Data Loader, your organization must have completed the deployment of the Root Cause Analysis module.

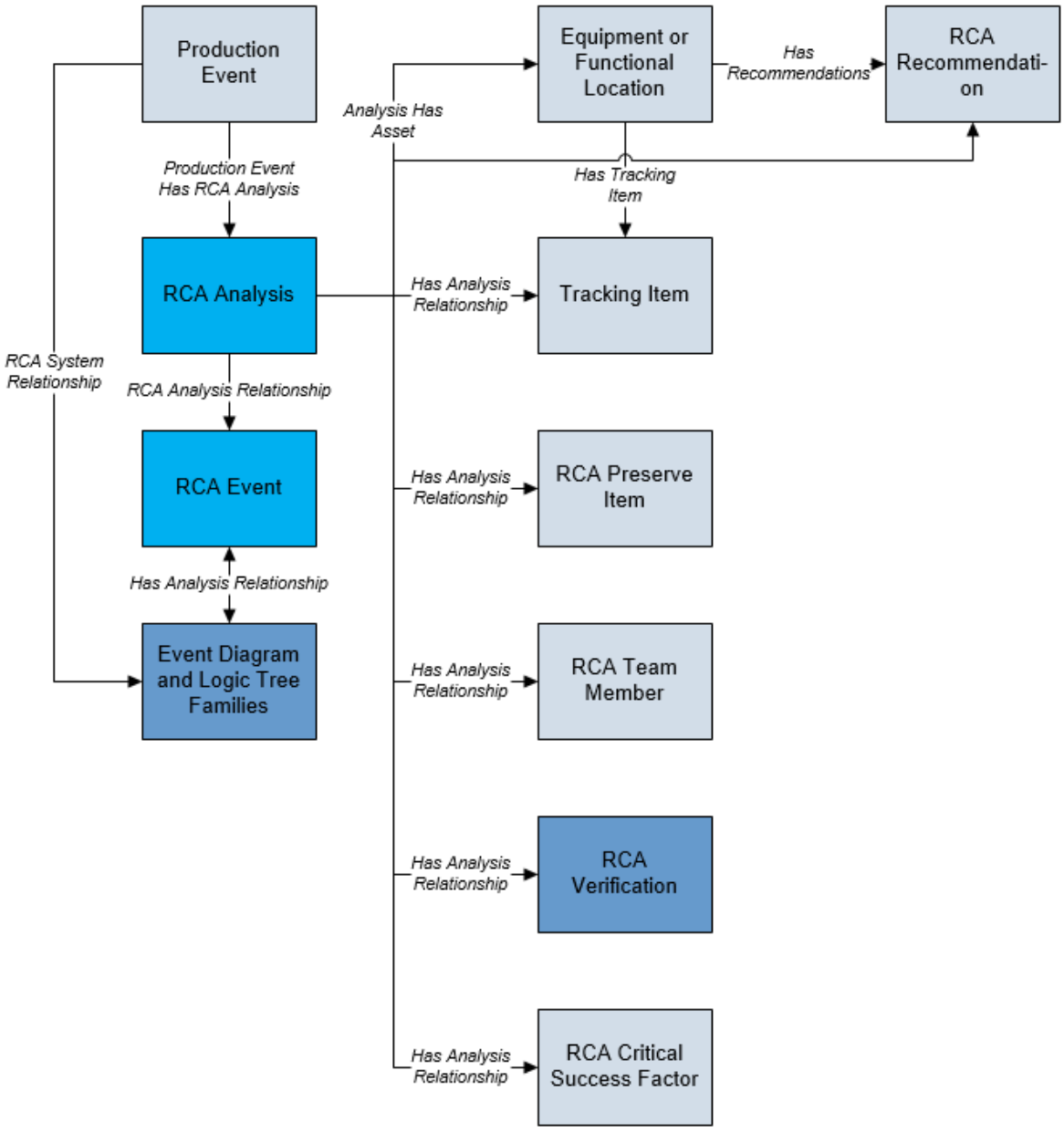
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI PROACT Administrator Security Group or a Security Role that is associated with this Security Group.

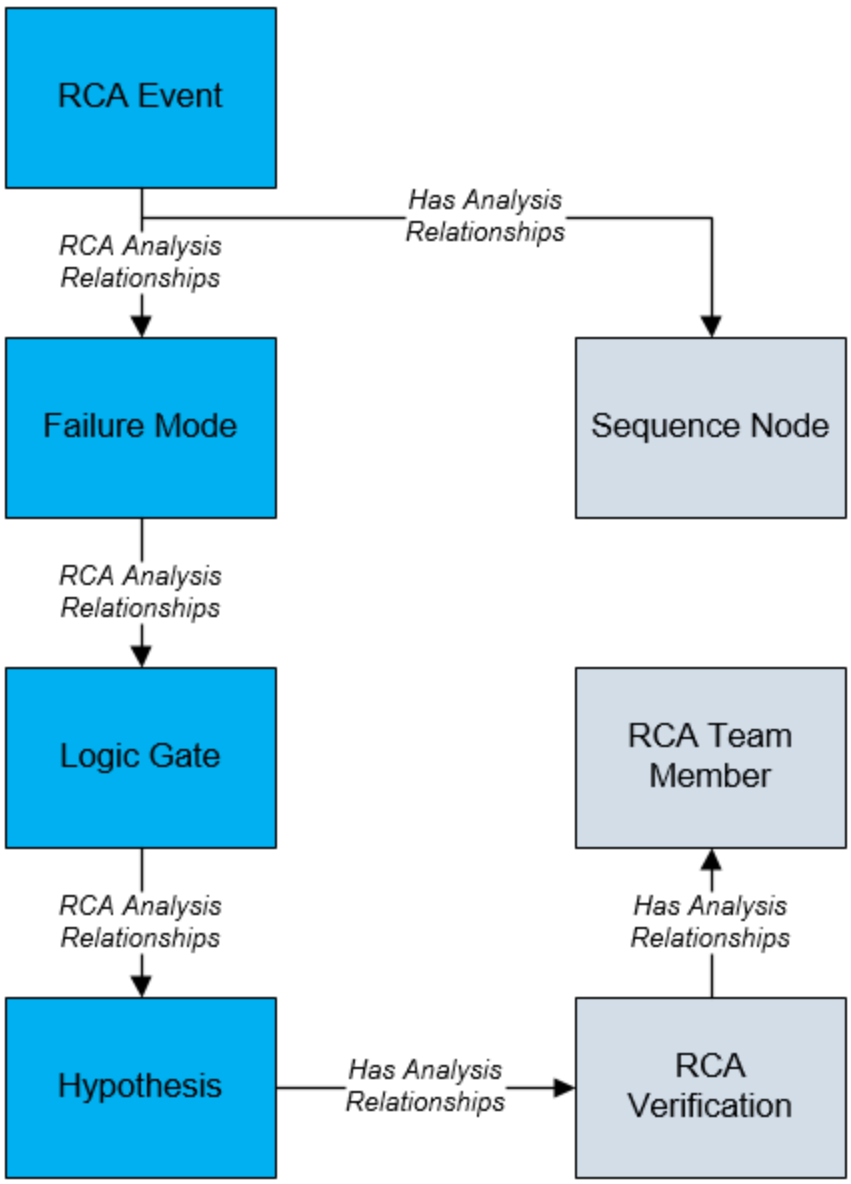
About the Root Cause Analysis (RCA) Data Loader Data Models

The following data models illustrate which records the Root Cause Analysis (RCA) Data Loader supports.

RCA Data Model



RCA Logic Tree Data Model



About the Root Cause Analysis (RCA) Data Loader General Loading Strategy

Best Practices

When importing data using the Root Cause Analysis (RCA) Data Loader, you must use the following best practices:

- ID fields (row 2 of each worksheet) must not include special characters or spaces.
- Columns in the worksheets should be formatted as either text or dates.
- The first two rows of each worksheet should not be edited.
- Only import a maximum of 500 analyses in each data load.

Limitations

This section documents a list of the limitations for the Root Cause Analysis (RCA) Data Loader:

1. The user must use the Root Cause Analysis (RCA) Data Loader workbook (**Root Cause Analysis (RCA).xlsx**). Any modifications made by the user to the values in column headings in any of the worksheets will not be imported.

   Note: Any column values in a customized format will not be imported by the Root Cause Analysis (RCA) Data Loader.

2. If the user imports the same data multiple times, the most recently imported data is included in the database. If a record currently resides in the database and is then reimported, the newly imported file will replace the existing file in the database. The Root Cause Analysis (RCA) Data Loader does not append the existing record.

Load Sequence

1. Create an RCA Analysis.
2. Create an RCA Event.
3. Link the RCA Event to the RCA Analysis through the *RCA Analysis Relationship*.
4. Create and link one or more Failure Modes to the RCA Event through the *RCA Analysis Relationship*.
5. Create and link one or more Logic Gates to a specific Failure Mode through the *Has Analysis Relationship*, where the Failure Mode is the predecessor of the Logic Gate.
6. Create and link one or more Hypotheses to a specific *Logic Gate*, through the *Has Analysis Relationship*, where the Hypothesis is the successor of the Logic Gate.

About the RCA Template Data Loader Workbook Layout and Use

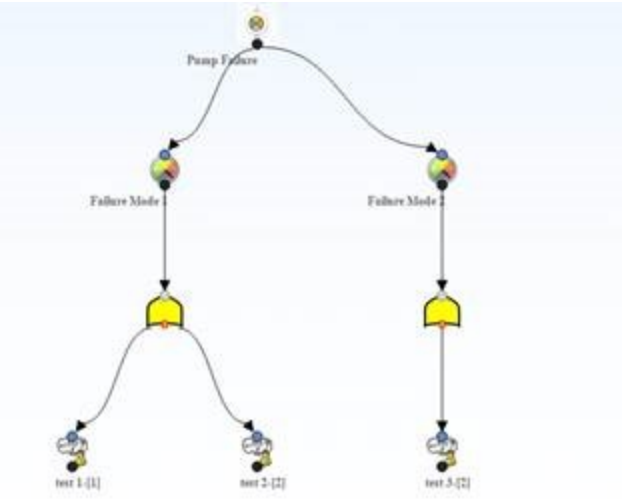
In order to import data using the Root Cause Analysis (RCA) Data Loader, GE Digital provides an Excel workbook (**Root Cause Analysis (RCA).xlsx**) that supports baseline Root Cause Analysis in GE Digital APM. This template must be used to perform the data load. Using custom changes in code and in design, you can modify the Excel template to include custom fields used by your organization.

The following table lists the worksheets that are included in the **Root Cause Analysis (RCA).xlsx** workbook:

Worksheet	Description
RCA_Analysis_Template	This worksheet is used to define Analysis records.
RCA_Event	This worksheet is used to define Event records.
RCA_Failure_Mode	This worksheet is used to specify Failure Mode details.
RCA_Logic_Gate	This worksheet is used to specify Logic Gate details.
RCA_Hypothesis	This worksheet is used to specify Hypothesis details.
RCA_Diagram_Relationship	This worksheet is used to specify Diagram Relationship details.

Example: RCA Diagram Relationship

The following Logic Tree diagram depicts an RCA Diagram Relationship for a Pump Failure. The Logic Tree displays two distinct parent nodes and their subsequent child nodes:



Using the Logic Tree diagram, you can parse the parent/child relationships into the RCA_Diagram_Relationship worksheet provided by the Root Cause Analysis (RCA) Data Loader workbook. Once the workbook is complete, the Root Cause Analysis (RCA) Data Loader can be employed:

RCA Template Key	Parent Node Key	Child Node Key	Parent Node Type	Child Node Type
RCA_TEMPLATE_KEY	PARENT_NODE_KEY	CHILD_NODE_KEY	PARENT_NODE_TYPE	CHILD_NODE_TYPE
1234	None	101	RCA_Analysis_Template	RCA_Event
1234	101	201	RCA_Event	RCA_Failure_Mode
1234	101	202	RCA_Event	RCA_Failure_Mode
1234	201	301	RCA_Failure_Mode	RCA_Logic_Gate
1234	202	302	RCA_Failure_Mode	RCA_Logic_Gate
1234	301	401	RCA_Logic_Gate	RCA_Hypothesis
1234	301	402	RCA_Logic_Gate	RCA_Hypothesis
1234	302	403	RCA_Logic_Gate	RCA_Hypothesis

System Code Tables

The following table lists the fields from the RCA System Codes table that must be configured:

Field Name	Field ID
Analysis Type	MI_AN_ANALY_TYPE_CHR
Hypothesis Confidence Factors	MI_RCA_HYPOTHESIS_CONFIDENCE_FACTORS
Hypothesis State	RCA_Hypothesis_State

RCA_Analysis_Template Worksheet

RCA Analysis records store basic information about a Root Cause Analysis created to

track and analyze causes of Asset failures.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Description	MI_AN_SHORT_DESCR_CHR	Character (255)	None
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	This field is required and must be unique.
Analysis Type	MI_AN_ANALY_TYPE_CHR	Character (50)	This field contains a list of the following values: • Mechanical • Operational • Quality • Safety • Environmental You can select the value that defines the type of analysis you are performing.
Comments	MI_RCA_ANALY_COMME_TX	Text	None
Cost Number	MI_RCA_ANALY_COST_NBR	Numeric	This field specifies the estimated cost of the failure event(s) you are analyzing. By default, the currency is set to $.

Field Caption	Field ID	Data Type (Length)	Comments
End Date	MI_RCA_ANALY_END_DATE_DT	Date	You can select a date using the Calendar tool. The date specified in the End Date field must be greater than the date specified in the Start Date field. The value that you enter in this field must be formatted in the following way based on your local time zone: YYYY-MM-DD HH:mm:ss (e.g. 2015-01-31 17:30:00).
Event Narration	MI_RCA_ANALY_EVENT_NARRA_TX	Text	The value of this field is information about the equipment failure.
Frequency Number	MI_RCA_ANALY_FREQU_NBR	Numeric	None
RCA Template Key	RCA_TEMPLATE_KEY	Numeric	This field is required and must be unique.
Start date	MI_RCA_ANALY_START_DATE_DT	Date	The value that you enter in this field must be formatted in the following way, dependent on your local time zone: YYYY-MM-DD HH:mm:ss (e.g., 2015-01-31 17:30:00).

RCA_Event Worksheet

RCA Event records store basic information about a failure event.

Field Caption	Field ID	Data Type (Length)	Comments
Event End Date	MI_EVENT_END_DT	Date	If the Root Cause Analysis was created from a Production Event, this field will be populated automatically with the value in the End Date field of that Production Event. Otherwise, you can define this value manually when you create the RCA Event. The date specified in the End Date field must be greater than the date specified in the Start Date field.
Event Label	MI_RCA_EVENT_LABEL_CHR	Character (255)	If the RCA was created from a Production Event, this field will be populated automatically with the value in the Headline field of that Production Event. Otherwise, you can define this value manually when you create the RCA Event. This field is required.
Event Long Description	MI_EVENT_LNG_DSC_TX	Text	If the RCA was created from a Production Event, this field will be populated automatically with the value in the Description field of that Production Event. Otherwise, you can define this value manually when you create the RCA Event.
Event Start Date	MI_EVENT_STRT_DT	Date	If the RCA was created from a Production Event, this field will be populated automatically with the value in the Start Date field of that Production Event. Otherwise, you can define this value manually when you create the RCA Event.
Event X Position Number	MI_RCA_EVENT_XPOSI_NBR	Numeric	The RCA Event Node is placed in the diagram at a predefined position, where the X Position Number is 350. A different value can be entered, but 350 is recommended.
Event Y Position Number	MI_RCA_EVENT_YPOSI_NBR	Numeric	The RCA Event Node is placed in the diagram at a predefined position, where the Y Position Number is 30. A different value can be entered, but 30 is recommended.

Field Caption	Field ID	Data Type (Length)	Comments
RCA Event Key	RCA_EVENT_KEY	Numeric	This field is required and must be unique.
RCA Template Key	RCA_TEMPLATE_KEY	Numeric	This field is required and must match the template key provided in the RCA_Analysis_Template worksheet.

RCA_Failure_Mode Worksheet

RCA Failure Mode records are possible causes associated with failure events.

Field Caption	Field ID	Data Type (Length)	Comments
Failure Mode Description	MI_RCA_FAILU_MODE_DESCR_TX	Text	The value of this field is a detailed description of the failure mode.
Failure Mode Label	MI_RCA_FAILU_MODE_LABEL_CHR	Character (255)	The name of the failure mode that you want to appear on the Logic Tree.
RCA Failure Mode Key	RCA_FAILU_MODE_KEY	Numeric	This field must contain a unique value that identifies a RCA Failure Mode. This field is required.
RCA Template Key	RCA_TEMPLATE_KEY	Numeric	This field is required and must match the template key provided in the RCA_Analysis_Template worksheet.

RCA_Logic_Gate Worksheet

RCA Logic Gate records define connections between logic nodes.

Field Caption	Field ID	Data Type (Length)	Comments
Logic Gate Type	MI_RCA_LOGIC_GATE_GATE_TYPE_CH	Character (50)	The value in this field must be either: • and • or This field is required.
Long Description	MI_RCA_LOGIC_GATE_LONG_DESCR_T	Text	The value of this field is a detailed description of the logic gate.
RCA Logic Gate Key	RCA_LOGICGATE_KEY	Numeric	This field is required and must be unique.
RCA Template Key	RCA_TEMPLATE_KEY	Numeric	This field is required and must match the template key provided in the RCA_Analysis_Template worksheet.
Short Description	MI_RCA_LOGIC_GATE_SHORT_DESCR_CHR	Character (255)	None

RCA_Hypothesis Worksheet

RCA Hypothesis records store basic information about the root cause of a failure event.

Field Caption	Field ID	Data Type (Length)	Comments
Confidence Factor Number	MI_RCA_HYPOT_CONFI_FACTO_NBR	Numeric	You can choose from the following values: • Not True (0) • Somewhat true (1) • Possibly • True (2) • Likely (3) • Highly Likely (4) • True (5) If you select a value in this field, the value that you select will appear in brackets to the right of the hypothesis name in the Logic Tree.
Description	MI_RCA_HYPOT_DESCR_TX	Text	The value of this field is a detailed description of the hypothesis.
Hypothesis State	MI_RCA_HYPOT_STATE_CHR	Character (255)	You can choose from the following states: • Hypothesis • Hypothesis True • Hypothesis Not True • Cause Human • Cause Latent • Cause Physical This field is set to Hypothesis by default.
Label	MI_RCA_HYPOT_LABEL_CHR	Character (255)	The value of this field is a description of the hypothesis as you want it to appear on the Logic Tree.

Field Caption	Field ID	Data Type (Length)	Comments
RCA Hypothesis Key	RCA_HYPOTHESIS_KEY	Numeric	This field is required and must be unique.
RCA Template Key	RCA_TEMPLATE_KEY	Numeric	This field is required and must match the template key provided in the RCA_Analysis_Template worksheet.

RCA_Diagram_Relationship Worksheet

RCA Diagram Relationship records display the parent-child relationship of the RCA families in Logic Tree diagrams.

Field Caption	Field ID	Data Type (Length)	Comments
RCA Template Key	RCA_TEMPLATE_KEY	Numeric	This field is required and must match the template key provided in the RCA_Analysis_Template worksheet.
Parent Node Key	PARENT_NODE_KEY	Numeric	The value of this field is the node key of the parent node. The parent node key is blank only when the parent-child relationship is created by an RCA Event.
Child Node Key	CHILD_NODE_KEY	Numeric	This field is required and must be unique.
Parent Node Type	PARENT_NODE_TYPE	Character (50)	This field is required.
Child Node Type	CHILD_NODE_TYPE	Character (50)	This field is required.

About the Root Cause Analysis (RCA) Data Loader Load Verification

Following a successful data load, you can navigate to the **RCA Overview** page and view any of the imported workbooks, to view the details and logic tree associated with the workbook, and to import workbook content into an analysis.

A successful import can also be defined as an event where partial data on a worksheet was loaded into GE Digital APM, and where the user was given appropriate messaging that enabled him or her to identify and correct issues resulting from the import.

About the APM Foundation Data Loaders

This topic provides a listing of all the APM Foundation Data Loaders.

About the ACA Data Loader

The ACA Data Loader allows existing or new Asset Criticality Analyses to be delivered to the ACA module in GE Digital APM for further development, analysis or implementation. Customers will be able to load data from other external systems into the ACA module via the Excel workbook. They will be able to upload any existing analyses with updated risk assessment data that has been assessed outside the GE Digital APM application. Sites assignments for the ACA records that are loaded with the ACA Data Loader are inherited from the related Functional Locations and Equipment that already exist in the GE Digital APM system.

The data loader is used in the following scenarios:

- Customers conducting an initial data load of ACA Analyses, including Analyses, System, Functional Locations, and Equipment for the purpose of completing Risk Assessments inside the GE Digital APM application.
- Customers updating existing ACA Analyses with Risk Assessments completed outside the GE Digital APM application.

Note: If you are using an export file generated from a version of GE Digital APM prior to V4.0.0.0 (e.g. V3.6.0.0.0), then that Excel file needs to be modified to match the current ACA Data Loader template.

About the ACA Data Loader Requirements

To use the ACA Data Loader, your organization must have completed fully the deployment of the Asset Criticality Analysis module. The ACA Data Loader should only be used after the Asset Criticality Analysis module has been implemented, and you have defined Assets (Equipment and Functional Locations) for your organization.

Mapping

The ACA Data Loader maps the datasheet columns in the Excel workbook to fields in GE Digital APM families. As a minimum, the standard worksheets contain columns that match all fields in standard ACA datasheets.

Mapping exists for all standard family fields, if you have added custom fields to a family, you must ensure that mappings exist for those fields, or data may not be populated as expected following the data load.

If you have a custom risk matrix, you must modify the data load worksheet to reflect the risk categories and risk values appropriate for your risk matrix.

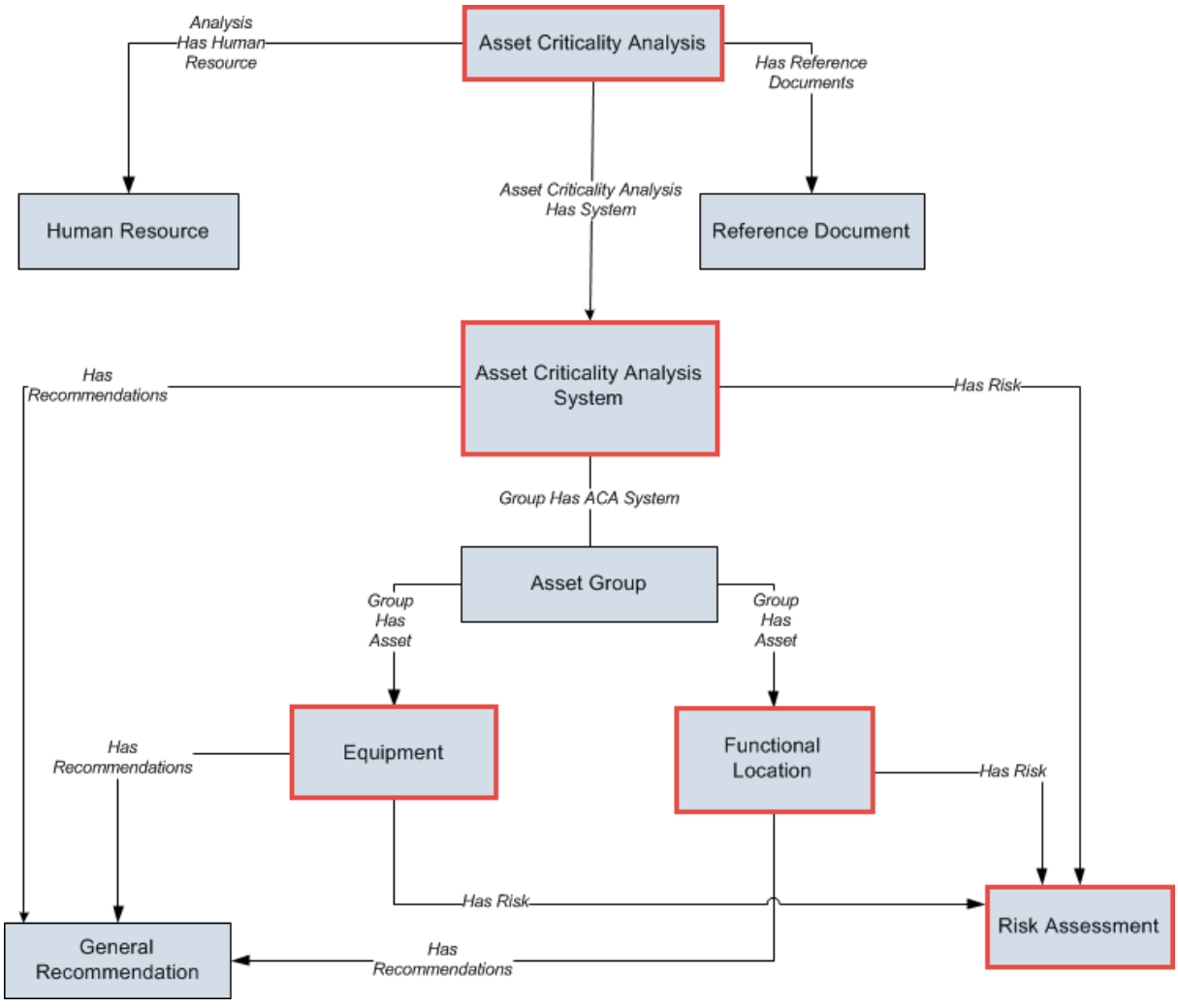
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI ACA Administrator Security Group or a Security Role that is associated with this Security Group.

About the ACA Data Loader Data Model

The data for an ACA Analysis is loaded from a single Excel workbook **ACA DataLoader (ACA).xlsx** containing multiple worksheets. This includes Analysis, System, Asset, Equipment and Risk Assessment data. These elements are highlighted with a red box around the relevant functional areas from the ACA data model extract shown below. Elements shown without a red border are data model elements that will not need to be loaded by the data loader.

Note: Asset Group is created internally and is not loaded by the dataloader.



About the ACA Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, refer to the Data Model section.

Prerequisites

- The sites to which ACA records are to be assigned have been created.

Load Sequence

Note: If you want to set the site reference to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.

The ACA data load must be performed in a specific sequence to successfully populate fields, create records and link them to the predecessor and/or successor records:

1. Create the ACA Analysis.
2. Create and link one or more ACA Systems to the ACA Analysis through the Asset Criticality Analysis *Has System* relationship.
3. Create and link a Risk Assessment to the ACA System through the *Has Risk* relationship.
4. Create and link one or more Functional Locations to the ACA System through the *Has Functional Location* relationship.
5. Create and link a Risk Assessment to the Functional Location through the *Has Risk* Relationship.
6. Create and link one or more Equipment to the ACA System through the Safety Analysis *Has Equipment* relationship.
7. Create and link one or more Equipment to the Functional Locations through the *Safety Analysis Has Equipment* relationship.
8. Create and link a Risk Assessment to the Equipment through the *Has Risk* Relationship.

Limitations

- In the data loader workbook, if the risks in the sheets are empty, the system risks are not inherited by the assets.
- You can only create a new Analysis, System, and then link functional Locations and equipment. If you want to add any functional Locations and equipment to an

existing system using a data loader workbook, all the earlier functional Locations and equipment are removed, and the new functional Locations and equipment are added.

About the ACA Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the ACA Data Loader, GE Digital provides an Excel workbook, **ACA DataLoader(ACA).xlsx**, which supports baseline Asset Criticality Analysis in GE Digital APM. This workbook must be used to perform the data load. You can modify the Excel template to include custom fields used by your organization.

The master Excel workbook contains one worksheet for each node that will be populated in the data model.

The following table lists the worksheets that are included in the **Asset Criticality Analysis (ACA)** workbook.

Worksheet	Description
Analysis	This worksheet is used to specify data for import to the Asset Criticality Analysis family.
System	This worksheet is used to specify data for import to the Asset Criticality Analysis System family including system level risk entries.
Asset	This worksheet is used to specify data for linking existing Functional Locations and Equipment to the Asset Criticality Analysis System family including asset level risk entries.
Equipment	This worksheet is used to specify data for linking existing Equipment to existing Functional Locations including equipment-level risk entries.

Each worksheet in the ACA Data Loader Template workbook contains field values that must be mapped to the appropriate GE Digital APM family/field combination. The individual sections in this document specify the source and target fields and relationships required between predecessor and successor.

The list of fields tabulated is not exhaustive. The user can add additional field columns to the worksheets and still perform a successful upload, provided:

- Column fields are properly mapped within the worksheet
- Equivalent fields exist in ACA

Analysis Worksheet

On the Analysis worksheet, you will specify the Analysis ID to which you want link the System. The columns that appear on this worksheet also appear on every subsequent worksheet, and are used to identify the records that will be linked, directly or indirectly, to

the analysis.

Note: Each row in this worksheet represents a *unique* analysis. You should not include the same analysis more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Batch ID	MI_BATCH_ID	Character (255)	This field is required and can be either a character string or numeric field.
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	This field is required and must be unique.
Site Reference Name	MI_SITE_NAME	Character (50)	This field is required and must match an existing Site name. **Note:** If you want to set the site reference to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.
Analysis Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This field contains a brief description about the Asset Criticality Analysis.
Analysis Owner	MI_ASCRTANL_OWNER_C	Character (255)	The name of the team member who is specified as the Process Owner for the ACA. This field is disabled and populated automatically with the value in the Process Owner field.
Analysis Type	MI_AN_ANALY_TYPE_CHR	Character (255)	This field contains the type of analysis.

System Worksheet

On the System worksheet, you will specify the systems that will be created and linked to analysis. The System ID column on this worksheet also appears on the Asset Worksheet and relates System to the Asset.

Note: Each row in this worksheet represents a *unique* system. You should not include the same asset more than once to the same analysis.

Note: When you enter *N/A* in the column for any of the Safety, Environment, Operations or Financial values in the Data Loader, the associated Unmitigated Risk is set as Not Applicable.

Field Caption	Field ID	Data Type (Length)	Comments
Batch ID	MI_BATCH_ID	Character (255)	This field is required and can be either a character string or numeric field.
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	This field is required and must be unique.
System ID	MI_ASCRTSYS_SYSTEM_ID_C	Character (255)	The System ID must be unique with respect to other systems that belong to the same analysis.
System Description	MI_ASCRTSYS_SYSTEM_DESCR_T	Text	A brief description of the system.
System Equipment Type	MI_ASCRTSYS_SYSTEM_EQ_TYPE_C	Character (255)	A description of the type of equipment that the system contains. You can select a value from the list.
System Process Type	MI_ASCRTSYS_SYSTEM_PROC_TYPE_C	Character (255)	The field describes the type of equipment that the system contains.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.

Field Caption	Field ID	Data Type (Length)	Comments
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Risk Rank	ENVIRONMENT-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Risk Rank	FINANCIAL-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) consequence	OPERATIONS|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Risk Rank	OPERATIONS-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.

Field Caption	Field ID	Data Type (Length)	Comments
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Protection Level	SAFETY|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Risk Rank	SAFETY-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
Basis for Assesment	MI_RISKASSE_BASIS_T	Text	Must be filled based on the risk matrix of the site.

Asset Worksheet

On the Asset worksheet, you will specify Functional Locations or Equipment that will be created and linked to the system. The Asset Id column that appears on this worksheet also appears on the Equipment Worksheet and relates Functional Location to the Equipment.

Note: Each row in this worksheet represents a *unique* asset. You should not include the same asset more than once.

Note: When you enter *N/A* in the column for any of the Safety, Environment, Operations or Financial values in the Data Loader, the associated Unmitigated Risk is set as Not Applicable.

Field Caption	Field ID	Data Type (Length)	Comments
Batch ID	MI_BATCH_ID	Character (255)	This field is required and can be either a character string or numeric field.
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	This field is required and must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
System ID	MI_ASCRTSYS_SYSTEM_ID_C	Character (255)	The System ID must be unique with respect to other systems that belong to the same analysis.
Asset ID	ASSET_ID	Character (255)	This field displays the identification number of a Functional Location or an Equipment.
Asset Family ID	ASSET_FAMILY	Character (255)	Based on the ID, this field is populates either an Equipment or a Functional Location.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Risk Rank	ENVIRONMENT-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	Must be filled based on the risk matrix of the site.

Field Caption	Field ID	Data Type (Length)	Comments
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Risk Rank	FINANCIAL-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) consequence	OPERATIONS|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Risk Rank	OPERATIONS-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Protection Level	SAFETY|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Risk Rank	SAFETY-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
Basis for Assesment	MI_RISKASSE_BASIS_T	Text	Must be filled based on the risk matrix of the site.

Equipment Worksheet

On the Equipment worksheet, you will specify equipment to which you want to link functional locations.

Note: Each row in this worksheet represents a *unique* equipment. You should not include the same equipment more than once.

Note: When you enter *N/A* in the column for any of the Safety, Environment, Operations or Financial values in the Data Loader, the associated Unmitigated Risk is set as Not Applicable.

Field Caption	Field ID	Data Type (Length)	Comments
Batch ID	MI_BATCH ID	Character (255)	This field is required and can be either a character string or numeric field.
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	This field is required and must be unique.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	If the Asset is a Functional Location, this field is populated based on the Asset ID.
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	ID of the Equipment
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(ENVIRONMENT) Risk Rank	ENVIRONMENT-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	Must be filled based on the risk matrix of the site.

Field Caption	Field ID	Data Type (Length)	Comments
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(FINANCIAL) Risk Rank	FINANCIAL-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) consequence	OPERATIONS|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	Must be filled based on the risk matrix of the site.
(OPERATIONS) Risk Rank	OPERATIONS-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	Must be filled based on the risk matrix of the site.
(SAFETY) Risk Rank	SAFETY-RISK_RANK	Numeric	Must be filled based on the risk matrix of the site.
Basis for Assessment	MI_RISKASSE_BASIS_T	Text	Must be filled based on the risk matrix of the site.

About the ACA Data Loader Load Verification

Prerequisites

After each spreadsheet is loaded:

1. Review the data loader log to identify any errors or warnings.
2. Update the data loader workbook to correct any errors, and then re-import.
3. Repeat until the import of each record is error free.

Steps

In order to test that data has loaded successfully, use the following steps:

Note: It is recommended that a query is executed in GE Digital APM on the relevant Family to ensure that records have been created and populated as expected. Imported records should also be checked in Asset Criticality Analysis to ensure that the expected relationships have been created.

Perform end-to-end workflow testing on a sample of loaded data as follows:

1. Log in to GE Digital APM.
2. On the left navigation menu, select **Health**, and then select **Asset Criticality Analysis**.

   The **Asset Criticality Analysis Home** page appears.
3. Select the **Analysis** tab.

   The **Analyses** section appears, displaying a list of Analyses. The uploaded data should appear in this list.
4. Select an **Analysis ID** corresponding to the uploaded data.

   The **Analysis Summary** page opens at the Overview tab.
5. Check that the summary data appears as expected.
6. Select the **Analysis Definition** tab.
7. Check that the definition fields appear as expected.
8. Select one **System** tab on the left hand panel.

   The **System** page appears on the **Overview** tab.
9. Check that the system overview data appears as expected.
10. Select the **System Definition** tab.

11. Check that the system definition fields appear as expected.
12. Select the **Risk** tab.
13. Check that the total risk, driving risk and individual risk scores appear as expected.
14. Select the **Risk Widget** to open the **Risk Matrix** page.
15. Check that the **Risk Matrix** page opens and that individual risk category scores are as expected.
16. Select the **Cancel** button to close the **Risk Matrix** page.
17. Select one **Asset** tab in the left hand panel.

    The **Asset** page opens at the **Risk** tab.
18. Check that the total risk, driving risk and individual risk scores appear as expected.
19. Select the **Risk Widget** to open the **Risk Matrix** page.
20. Check that the **Risk Matrix** page opens and that individual risk category scores are as expected.
21. Select the **Cancel** button to close the **Risk Matrix** page.
22. Repeat the steps 8 to step 21 to check for the uploaded ACA System records.
23. Repeat the steps 3 to step 21 to check for the uploaded ACA records.

About the Custom Asset Hierarchy Data Loader

The Custom Asset Hierarchy Data Loader is designed to load data into the Asset Hierarchy Entity family in GE Digital APM, and is also used to relate records in that family to other families in GE Digital APM based on the relationship definitions defined in Family Management. You can create Custom Asset Hierarchy Data Loader workbooks for the following purposes:

- Entity Family Data: Used to load data or records.

  -and-

- Relationship Family Data: Used to relate a record in an entity family to another record in different entity family.

The data loader workbooks used by the Custom Asset Hierarchy Data Loader are created using the metadata definitions configured in your GE Digital APM system. When the data is loaded, the Custom Asset Hierarchy Data Loader will trigger all of the associated field and family level rules, to ensure that the data is valid, but no further validation is done to the data. You should, however, verify that the intended data, records, or relationships are present in the GE Digital APM system after a data load has been completed.

About the Custom Asset Hierarchy Data Loader Requirements

Determine Which Families and Relationships to Populate

You can determine which families are available and how families are related in Family Management. To access Family Management:

1. Log in to GE Digital APM.
2. On the left navigation menu, select **Admin**, and the select **Family Management**.

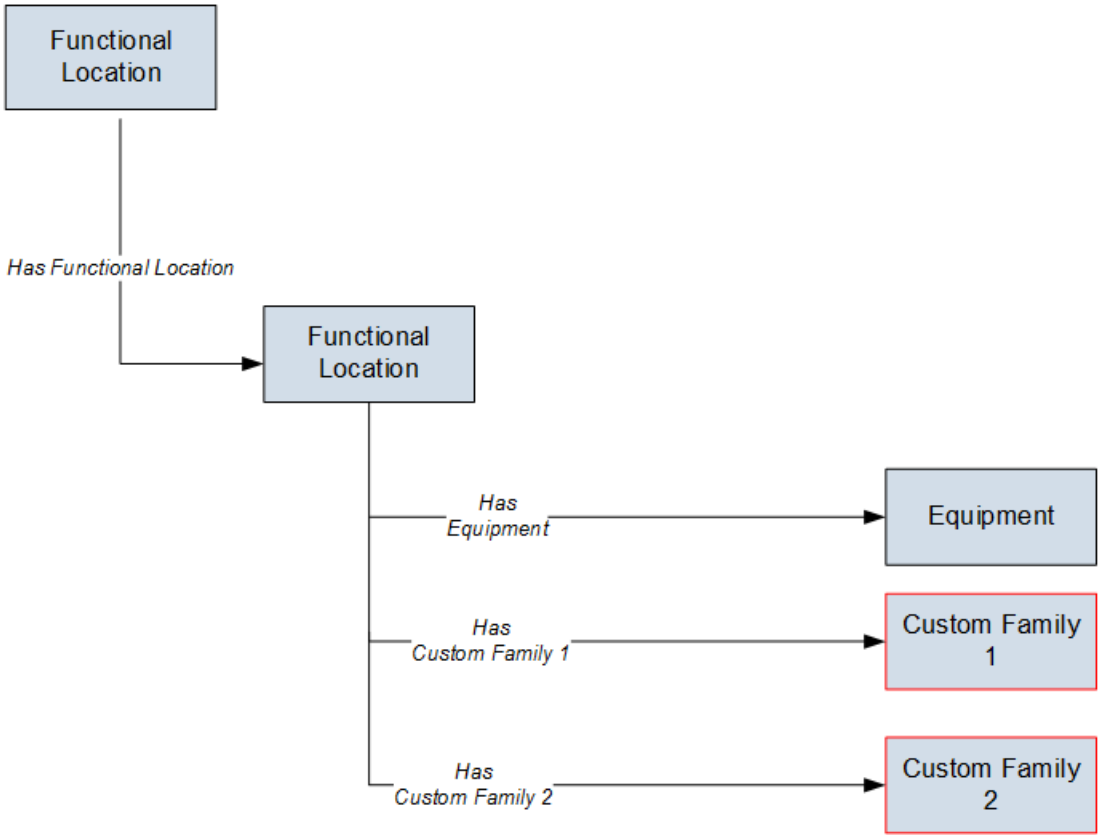
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role. Depending on the type of data that the Security User wants to load, the user may need to be associated with additional Security Roles to grant privileges to create the necessary records. To determine if additional Security Role association is needed to create a particular type of record, consult the About Roles topic in the GE Digital APM Administrative User Help documentation.

About the Custom Asset Hierarchy Data Loader Data Model

The following data model illustrates the records that the Custom Asset Hierarchy Data Loader supports. The Family records illustrated with a red border are customizable.

Custom Asset Hierarchy Data Loader Data Model



About the Custom Asset Hierarchy General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

General Loading Strategy Workflow

1. Determine what families and or relationships you want to populate using the Custom Asset Hierarchy Data Loader.
2. Populate the **Configuration** worksheet.

This data loader may run on a schedule as part of the EAM data load service.

About the Custom Asset Hierarchy Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Custom Asset Hierarchy Data Loader, GE Digital provides an Excel workbook that must be used to perform the data load.

The following table lists the worksheets that are included in the **MI_AH_Entity_Dataloader.xlsx** workbook.

Worksheet	Description
Configuration	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
AHEntity	Where you specify the actual Asset Hierarchy entities that you want to load.
LinkAHEntitytoEntity	Where you can connect an Asset Hierarchy entity to another Asset Hierarchy entity.
LinkAHEntitytoFL	Where you can connect an Asset Hierarchy entity to a Functional Location, Equipment, or some other asset concept defined by the Family Management settings.

Each worksheet in the Custom Asset Hierarchy Data Loader workbook contains field values that can be mapped to the appropriate GE Digital APM family/field.

Configuration Worksheet

The Configuration worksheet tells the Custom Asset Hierarchy Data Loader what types of data are being loaded and how the data is to be loaded, and is standard for all data loads regardless of the type of data that you are loading. The following table outlines the options that are valid or the values that are expected in each of the columns on the Configuration worksheet.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Load Data From Worksheet	LOAD_DATA_WORKSHEET	Boolean	• True • False	The value in this column will determine whether or not the data should be loaded from the worksheet.
Data Worksheet ID	DATA_WORKSHEET_ID	Character	• AHEntity • LinkAHEntitytoEntity • LinkAHEntitytoFL	This column contains the name of the worksheet where the actual data is located. It needs to have the same name as the worksheet in the data loader workbook.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Batch Filter Column	BATCH_FILTER_COL_ID	Character	• MI_AH_ENTITY_PRNT_ID_CHR • '<PRED_FAMILY_ID>'|MI_AH_ENTITY_ID_CHR	When the data is loaded into GE Digital APM, it is processed in a series of batches. This column contains the Data Column ID that will be used for the batching of the data. All of the records will be grouped together by the unique values in the column specified in the worksheet. This column must also be the first column that exists in the worksheet. It must be the Column ID, which is in the second row on the worksheet and not the Field ID.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	• MI_AH_ENTITY • MIR_ENTYHSENTY • MIR_ENTYHSASSET	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the GE Digital metadata contains spaces, then you have to use this feature.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	• MI_AH_ENTITY_ID_CHR	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE		• Entity • Relationship	The value is this column should be *Entity* or *Relationship* depending on the type of data that is being loaded.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Predecessor Family ID	PRED_FAMILY_ID	Character	• <PRED_FAMILY_ID>	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Predecessor Family Key Fields	PRED_FAMILY_KEY_FIELDS	Character	• MI_AH_ENTITY_ID_CHR	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Successor Family ID	SUCC_ FAMILY_ID	Character	• <SUCC_FAMILY_ ID>	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	• MI_AH_ENTITY_ID_CHR • MI_FNCLOC00_FNC_LOC_C	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Primary Action	PRIMARY_ACTION	Character	• ACTION_INSERTUPDATE	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is *Entity*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
				simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Predecessor Action	PRED_ACTION	Character	• ACTION_NONE • ACTION_LOCATE	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the value needs to be: • ACTION_NONE

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Successor Action	SUCC_ACTION	Character	• ACTION_NONE • ACTION_LOCATE	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the value needs to be: • ACTION_NONE

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Insert with Null Values?	OPTION_INSERT_ON_NULL	Boolean	• True • False	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_UPDATE_ON_NULL	Boolean	• True • False	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Replace an Existing Link?	OPTION_REPLACE_EXISTING_LINK	Boolean	• True • False	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship *Location Contains Asset* that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
				another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Allow Change of Family?	OPTION_ALLOW_CHANGE_OF_FAMILY	Boolean	• True • False	Allows the data loader to move an entity from one family to another. For example, this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note**: Because of the extra processing required, by selecting this option, the interface performance will decrease.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Process Each Row as a Transaction?	OPTION_TRANSACTION_PER_ROW	Boolean	• True • False	When this value is set to True, each row in the spreadsheet is committed before the next row is processed. If this is set to False, then all of the records in the batch are processed in one transaction. In general, you will get better performance when processing data in a batch, assuming that the data being loaded is clean, meaning that the vast majority of records will not be rejected.

Asset Hierarchy Entity (AHEntity) Worksheet

The following table outlines the options that are valid or the values that are expected in each of the columns on the Asset Hierarchy worksheet.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Entity Parent ID	MI_AH_ENTY_PRINT_ID_C	Character	• MRD-PER	This is the unique identifier of the parent value that you want to link to your entity.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Entity ID	MI_AH_ENTY_ID_C	Character	• MRD-PER • MRD-PER-ABC • MRD-PER-DEF	This is the unique identifier for the entity that you are adding to the worksheet.
Entity Name	MI_AH_ENTY_NAME_C	Character	• Perth • ABC Perth • DEF Perth	The name of the asset that you are adding to the worksheet.
Site Reference	MI_SITE_NAME	Character	• Perth, Australia	The site reference associated with the entity.

Link an Asset Hierarchy Entity to Another Entity (LinkAHEntityToEntity) Worksheet

The following table outlines the options that are valid or the values that are expected in each of the columns on the Asset Hierarchy Entity to Entity worksheet.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Parent ID	<PRED_FAMILY_ID>|MI_AH_ENTY_PRINT_ID_C	Character	• MRD-PER	This is the unique identifier of the parent value that you want to link to your entity.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Predecessor Family ID	PRED_FAMILY_ID	Character	• MI_AH_ENTITY	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Entity ID	<SUCC_FAMILY_ID>|MI_AH_ENTY_ID_C	Character	• MRD-PER-ABC • MRD-PER-DEF	The unique identifier of the asset that is being loaded into the Asset Hierarchy.
Successor Family ID	SUCC_FAMILY	Character	• MI_AH_ENTITY	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Link an Asset Hierarchy Entity to a Functional Location (LinkAHEntitytoFL) Worksheet

The following table outlines the options that are valid or the values that are expected in

each of the columns on the Asset Hierarchy Entity to Functional Location worksheet.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Entity_ID	<PRED_FAMILY_ID>|MI_AH_ENTY_PRINT_ID_C	Character	• MRD-PER-ABC • MRD-PER-DEF	The unique identifier of the asset that is being loaded into the Asset Hierarchy.
Predecessor Family ID	PRED_FAMILY_ID	Character	• MI_AH_ENTITY	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Functional Location	<SUCC_FAMILY_ID>|MI_FNCLOC00_FNC_LOC_C	Character	• MRD-ROA-ABC-XYZ-FCV1005 • MRD-ROA-ABC-XYZ-FCV1006 • MRD-ROA-ABC-XYZ-PCV1001 • MRD-ROA-ABC-XYZ-PCV1002	The location of the asset that you are loading into the Asset Hierarchy.

Field Caption	Field ID	Data Type	Potential Value(s)	Comments
Successor Family ID	SUCC_FAMILY	Character	• MI_FNCLOC00	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

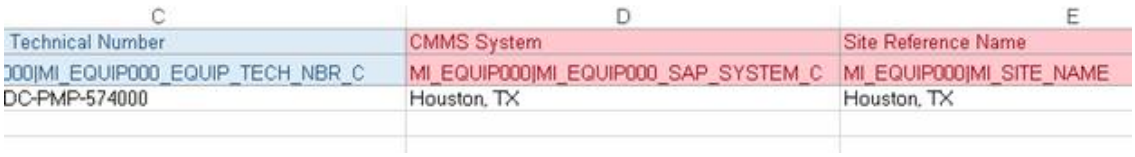
About Populating Site Reference Data

The Custom Asset Hierarchy Data Loader can be used to populate the Site Reference on Equipment and Functional Location records in GE Digital APM. The Custom Asset Hierarchy Data Loader populates the ENTY_KEY system field and the MI_SITE_KEY system field associated with the Site Reference value to be populated. On asset records, the Site Reference is stored in the MI_SITE_KEY field, a system field in GE Digital APM. The Custom Asset Hierarchy Data Loader uses the Site Name (MI_SITE_NAME) to translate the value to the corresponding Site Key and populate the MI_SITE_KEY field; therefore, you do not need to know the key to be able to populate the site reference. This functionality is important because this value can change from one database to another.

Steps: Populate Site Reference Using the Site Name

1. On the data worksheet, add a column that contains MI_SITE_NAME in the column name.

   For example if you are working with a relationship, where a distinction needs to be made regarding which family is associated with each column, then the column name will be prefaced with the Family ID. As shown in the following image, the column name might take the form 'MI_EQUIP000|MI_SITE_NAME', where MI_EQUIP000 is the Family ID.



C	D	E
Technical Number	CMMS System	Site Reference Name
000|MI_EQUIP000_EQUIP_TECH_NBR_C	MI_EQUIP000|MI_EQUIP000_SAP_SYSTEM_C	MI_EQUIP000|MI_SITE_NAME
DC-PMP-574000	Houston, TX	Houston, TX

2. Enter the site name to designate the site by which the asset record, once loaded into GE Digital APM, will be filtered.
3. Continue populating the source workbook, and then run the data loader.

   The site reference value will filter the equipment records as determined in the source workbook.

About the Custom Asset Hierarchy Data Loader Load Verification

After loading data, you must perform the following steps in GE Digital APM to ensure the integrity and accuracy of the data imported from the data loader workbook:

- Review the details of the import job. These details will indicate any errors that occured during the data load. The log helps you identify any records that are not loaded.
- Run a query on the relevant family to ensure that the records have been created and populated as expected.
- Verify the imported records in Asset Hierarchy to ensure that the relationships between families have been created.
- Verify that the assets in a Functional Location of the Custom Asset Hierarchy Data Loader exist.

  To view the assets, perform the following steps:

  1. Log in to GE Digital APM.
  2. On the top navigation bar, select  .

     The **Assets** page appears.
  3. Select a Functional Location of Custom Asset Hierarchy Data Loader.

About the Geographic Information System (GIS) Data Loader

The GIS Data Loader allows geospatial data associated with existing entities to be delivered to the GIS module (Maps) in GE Digital APM for further development, analysis, or implementation. Customers will be able to load data from other external systems into the GIS module via the Excel workbook.

About the GIS Data Loader Requirements

To use the GIS Data Loaders, your organization must have completed fully the deployment of the Maps module, with populated Family and Entity IDs.

Mapping

The GIS Data Loader populates geospatial data in the MI_ENTY_GEO_DATA table by mapping specified cells in the Excel workbook to the Entity Key field in GE Digital APM. The data loader populates the data in the following order:

1. ENTITY_KEY
2. ENTITY_ID
3. FAMILY_ID + ID_FIELD + ID

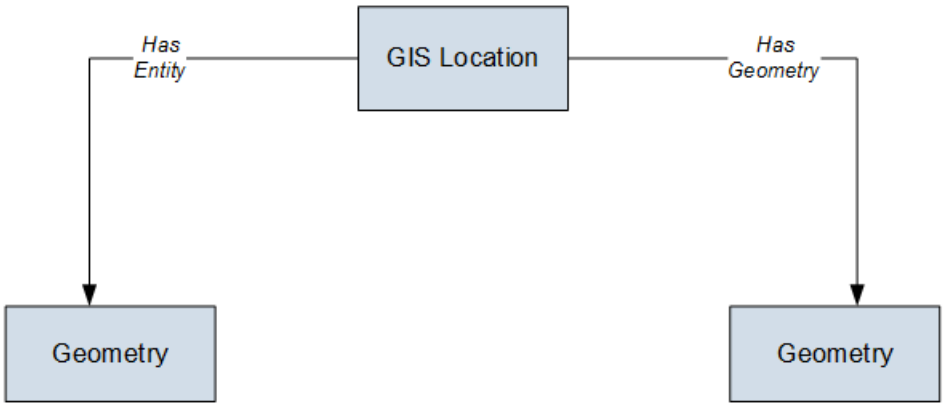
Note: The column positions in the spreadsheet should not be moved and the captions should not be changed.

Note: If data is not provided, the cell should be left empty.

About the GIS Data Loader Data Model

The following data model illustrates the records that the Data Loader supports.

GIS Data Loader Data Model



Note: In the diagram, GIS Location refers to the name of a database table. You can relate each GIS Location to an Entity of any family in GE Digital APM. Geometry represents the actual data for GIS Location. The Has Entity and Has Geometry are not the relationships defined in GE Digital APM. They are the relationships in an internal database and the purpose is same as the relationships between families.

About the GIS Data Loader General Loading Strategy

The imported data must load in a specific sequence to successfully populate fields, create records, and link data to the predecessor and successor records.

Best Practices

When importing data using the GIS Data Loader, you must use the following best practices:

- To populate a record, use the ENTITY_KEY.
- To search for an ENTITY_KEY, use the ENTITY_ID value.
- To search for an ENTITY_KEY if ENTITY_ID is not provided, use the FAMILY_ID, ID_FIELD, and ID values together.
- To create a new record, the referenced Entity Key should not have a corresponding record in the target table and provide the geospatial data.
- To update a record, the referenced Entity Key should have a corresponding record in the target table, and to update new information, provide the new geospatial data.
- To delete an existing record, the Entity Key referenced should have corresponding record in the target table, and do not provide the geospatial data (the cell should be empty).
- Geospatial data in the GEOD_DATA column should conform to the geometry spatial data type.
- All columns in the worksheets must be formatted as Text or Entity Key. Entity Keys should be formatted as Numbers.

Load Sequence

When importing data using the data loader workbook, you must use the following workflow:

1. Download the data loader workbook provided by GE Digital
2. Identify the data requirements for exporting the data into the data loader workbook.
3. Extract data from legacy applications to populate the data loader workbook.
4. Provide batch numbers in the Batch worksheet and in the first column of the remaining worksheets in the data loader workbook.
5. Import data into GE Digital APM.

6. Monitor the status of the data load, and verify the results in the log.
7. Conduct tests in GE Digital APM to ensure that the imported data loaded accurately.

For each row in the data loader workbook, the GIS Data Loader creates a new record in GE Digital APM. However, if records have already been created and you import the data, the existing records will be updated.

About the GIS Data Loader Workbook Layout and Use

In order to import data using the GIS Data Loader, GE Digital provides an Excel workbook, **Geographic Information System (GIS).xlsx**, which supports baseline GIS in GE Digital APM. This workbook must be used to perform the data load.

The following table lists the worksheets that are included in the GIS Data Loader workbook.

Worksheet	Description
GIS	The only worksheet used by the GIS Data Loader. It is used to load geospatial data for existing entities.

The following table lists the fields in the workbook:

GIS Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Batch ID	BATCH_ID	Character (50)	This is the Batch ID field.
Entity Key	ENTITY_KEY	Numeric	This is the Entity Key field.
Entity ID	ENTITY_ID	Character (255)	This is the Entity ID field.
Family ID	FAMILY_ID	Character (50)	This is the Family ID field.
Family ID Field	ID_FIELD	Character (50)	This is the ID Field name for the specified Family.
ID	ID	Character (255)	The is the ID field.
Geometry	GEOD_DATA	Character (4000)	This is the Spatial Data Field.

About the GIS Data Loader Load Verification

After loading data, you must perform the following steps in GE Digital APM to ensure the integrity and accuracy of the data imported from the data loader workbook:

- Review the details of the import job. These details will indicate if any errors occured during the data load. The log helps you identify any records that are not loaded.
- Run a query to view a Geospatial data uploaded. You can use the baseline Map Query that is stored in the folder \\Tools\Maps\Baseline Map Query as a reference.

About the Role Data Loader

The Role Data Loader allows existing or new Security Roles to be delivered to GE Digital APM. You can load data into GE Digital APM via the Excel workbook.

The data loader is used in the following scenarios:

- To create new Security Roles and associate them with existing Security Users and Security Groups.
- To modify the Security Users and Security Groups associated with existing Security Roles.

Note: If you are using an export file generated from a version of GE Digital APM prior to V4.0.0.0 (e.g. V3.6.0.0.0), then that Excel file needs to be modified to match the current Role Data Loader template.

About the Role Data Loader Requirements

To use the Role Data Loader, the Security Users and Security Groups that you want to associate with new and existing Security Roles must already exist in your GE Digital APM system.

Mapping

The Role Data Loader maps the datasheet columns in the Excel workbook to fields in GE Digital APM families.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

About the Role Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, refer to the Data Model section.

Prerequisites

- The Security Users and Security Groups that you want to associate with new and existing Security Roles already exist in your GE Digital APM system.

About the Role Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

To import data using the Role Data Loader, GE Digital provides an Excel workbook, **Role.xlsx**, which supports the Security Role feature in GE Digital APM. This workbook must be used to perform the data load. You can modify the Excel template to include custom fields used by your organization.

The following table lists the worksheets that are included in the **Role** workbook.

Worksheet	Description
Role	This worksheet is used to specify data for import to the Security Role family.
RoleGroup	This worksheet is used to specify the Security Groups that should be associated with the Security Roles.
RoleUser	This worksheet is used to specify the Security Users that should be associated with the Security Roles.

Each worksheet in the Role Data Loader Template workbook contains field values that must be mapped to the appropriate GE Digital APM family/field combination.

Role Worksheet

On the Role worksheet, you will specify the information for the Security Role record.

Note: Each row in this worksheet represents a *unique* role. You should not include the same role more than once.

Field Caption	Field ID	Data Type (Length)	Comments
ID	ROLE_ID	Character (255)	This field is required, and represents the ID for the Security Role.

Field Caption	Field ID	Data Type (Length)	Comments
Caption	ROLE_CAPTION_TX	Character (255)	This field is required. A title or explanation that identifies the Security Role. A property that specifies how the Security Role is labeled throughout the software interface. Note that most captions can be localized.
Description	ROLE_DESC_TX	Character (255)	This field is optional, and can contain a detailed description of the Security Role.

RoleGroup Worksheet

On the RoleGroup worksheet, you will specify existing Security Group records that you want to associate with Security Roles.

Field Caption	Field ID	Data Type (Length)	Comments
RoleId	ROLE-ID	Character (255)	This field is required. Enter the ID of the Security Role with which Security Groups will be associated.
GroupId	SEGR_ID	Character (255)	This field is required. Enter the GroupId of the Security Group with which Security Role will be associated.

RoleUser Worksheet

On the RoleUser worksheet, you will specify existing Security User records that you want to associate with Security Roles.

Field Caption	Field ID	Data Type (Length)	Comments
RoleId	ROLE_ID	Character (255)	This field is required. Enter the ID of the Security Role with which Security Users will be associated.

Field Caption	Field ID	Data Type (Length)	Comments
UserId	SEUS_ID	Character (255)	This field is required. Enter the UserId of the Security User with which Security Role will be associated.

About the APM Health Data Loaders

This topic provides a listing of all the APM Health Data Loaders.

About the Rounds Data Loaders

The Rounds Data Loaders allow you to load data required for the initial setup of Routes and Template Groups, as well as upload Readings to the Rounds module in GE Digital APM.

The Rounds Data Loaders support the following functions:

- Loading Rounds data sourced from legacy or third-party systems during system implementation.
- Ongoing import of data to create new Measurement Locations, Lubrication Requirements, and Routes. For example, you might manually create Routes in Excel, or use an EAM system to define preventive maintenance checks.
- Ongoing import of Readings not collected via the Rounds Data Collection module. For example, you might import data related to checks that are carried out on your behalf by a maintenance contractor using that entity's proprietary systems.
- Importing Template Groups and Routes containing Checkpoint Conditions (i.e., branching logic)

The Rounds Data Loaders do not support:

- Updating existing Allowable Value records
- Reordering existing Templates in a Template Group
- Importing Operator Rounds Recommendations

About the Rounds Data Loaders Requirements

This documentation assumes that your organization has completed the deployment of the Rounds module. The Rounds Data Loaders should only be used after the Rounds module has been implemented.

The Rounds Data Loaders are used to create records in the following families and relevant relationships:

- Rounds Allowable Values Data Loader
  - Allowable Value
- Rounds Templates Data Loader
  - Template Group
  - Measurement Location Template
  - Lubrication Requirement Template
  - Checkpoint Template Sequence
  - Checkpoint Condition
- Rounds Routes Data Loader
  - Route
  - Measurement Location
  - Lubrication Requirement
  - Checkpoint Task
  - Checkpoint Condition
- Rounds Readings Data Loader
  - Reading

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI Operator Rounds Administrator Security Group or a Security Role that is associated with this Security Group.

Assumptions

- All imported date values are in UTC
- Functional Locations and/or Equipment have already been loaded into GE Digital APM
- Blank values are not copied to the entities. If there are blank values, those fields will be skipped

- No customization (i.e., rules changes) is done on the related families that override the baseline families

About the Rounds Data Loaders Data Models

The data for Rounds is loaded from four different data loader workbooks, some of which contain multiple worksheets.

The Rounds Allowable Values data loader workbook includes:

- Allowable Values worksheet (MI_OPR_AL_VL)

The Rounds Templates data loader workbook includes:

- Template Group worksheet (MI_DTACLTMP)
- Measurement Location worksheet (MI_ML_TMPLT)
- Checkpoint Template Sequence worksheet (MI_HSCPTMP)
- Lubrication Requirement worksheet (MI_LR_TMPLT)

The Rounds Routes data loader workbook includes:

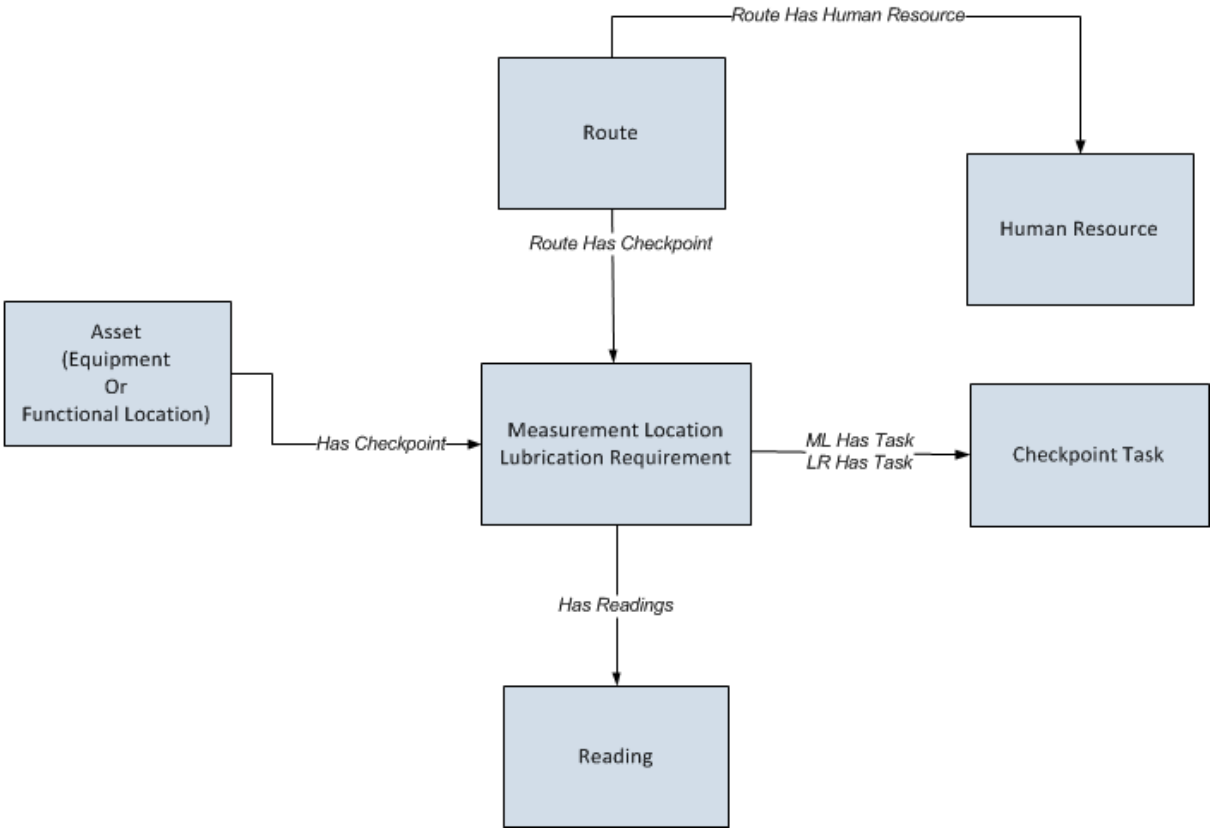
- Route worksheet (MI_ROUTE000)
- Security User worksheet (MI_Security User)
- Measurement Location worksheet (MI_MEAS_LOC)
- Checkpoint Task worksheet (MI_CP_TASK0)

The Rounds Readings data loader workbook includes:

- Readings worksheet (MI_READING0)

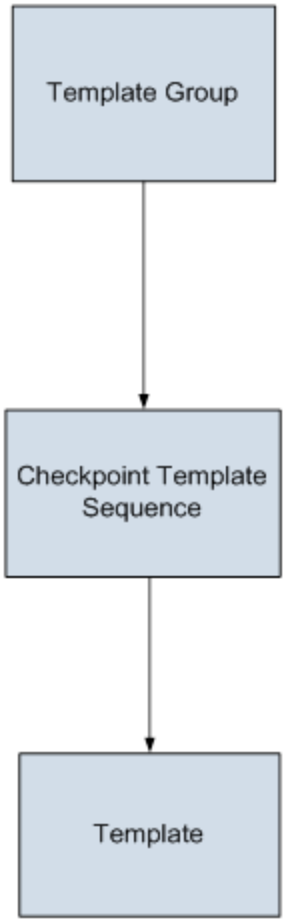
Rounds Route and Reading Data Loader Data Model

The following Data Model illustrates the Route and Readings Data Loaders.



Rounds Template Data Loader Data Model

The following Data Model illustrates the Template Data Loader.



About the Rounds Data Loaders General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, review the Data Model section.

Data Import

When importing data using the Rounds Data Loaders:

- You *must* use the data loader workbook while considering the rules described in Workbook Layout and Use topic.
- The current version of the Rounds Data Loaders can process insertion of up to approximately 500 Measurement Location and Lubrication Requirement records for a single Route record per workbook. When updating existing records, up to approximately 500 Measurement Location and Lubrication Requirement records can be processed for a single Route record per workbook.

Limitations

Due to performance limitations in Rounds Designer, it is recommended that Template Groups contain no more than 150 Measurement Location Templates in a single data load.

Schedule and Date Fields

- The Rounds Data Loaders require that Schedule values are expressed using the JSON format used in the GE Digital APM database. Valid schedule expressions may be easily generated via the schedule setting feature on a schedule field in a Route or Checkpoint Task record in Record Manager, and then copying the resulting text value to the worksheet.
- The Route Data Loaders use a non-standard date format. Data should be formatted as yyyy-mm-dd hh-mm-ss (e.g., 2015-05-23 17-45-34).
- All date values are assumed to be in UTC. The time zone of the user loading the data is not relevant.

Prerequisites

- If you are not using the standard asset hierarchy (Functional Location / Equipment), the Rounds module is configured with the required relationships to any other asset families, and the asset hierarchy is configured to use these families
- The sites to which Rounds records are to be assigned have been created.

- Users to whom Routes will be assigned have both Security User and Human Resource records.
- Any customization related to the imported families (i.e., added fields, custom rules, family policies, etc. which are to be relied upon during the import process) is completed and tested.
- All custom Unit of Measure values have been added to the global UOM list and UOM conversion sets.
- Licenses for Rounds (i.e., the Operator Rounds or Lubrication Management license) and any level of APM Connect are active.
- If you want Health Indicators to be created automatically for Measurement Locations that are linked to assets, then the Asset Health Indicator Service must be configured and started. Note that Health Indicators can be added or removed at any time in Asset Health Manager Administration.

Load Sequence

When importing data using the Rounds Data Loaders, use the following workflow:

1. Download the template workbooks provided by GE Digital
2. Identify data requirements.
3. Extract data from legacy applications to populate the data loader workbook.
4. Load data using the Rounds Allowable Values Data Loader.
5. Verify import logs and ensure that all required Allowable Values are loaded successfully.
6. Load data using the Rounds Templates Data Loader.
7. Verify import logs and ensure that all required ML Templates, LR Templates and Template Groups are loaded successfully.
8. Load data using the Rounds Routes Data Loader.
9. Verify import logs and ensure that all required MLs, LRs, and Routes are loaded successfully.
10. Load data using the Rounds Readings Data Loader.
11. Verify import logs and ensure that all required Readings are loaded successfully.
12. Conduct tests in GE Digital APM to ensure that the imported data loaded properly.

Rounds Allowable Values Data Loader

When importing data using the Rounds Allowable Values Data Loader, the data loader will create one Allowable Value record for each row of the worksheet. If the import worksheet specifies an Allowable Value that is an exact match for an existing record, the record is not imported. Since the unique identification of an Allowable Value record

includes all its fields, it is not possible to update existing Allowable Value records using the data loader.

Note: Allowable Values records do not support Site Filtering.

Rounds Templates Data Loader

When importing data using the Rounds Templates Data Loader, the data loader will create records as follows:

- **Template Groups**: The data loader will create one Template Group record for each row in the import worksheet. If the Template Group ID specified matches the Template Group ID of an existing Template Group, the existing record will be updated.

  The Template Groups will be loaded into GE Digital APM, and will be filtered based on the designated site name in the Site Reference Name field.

  Note: If you want to set the site reference to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.

  The following site inheritance rules are applied when Template Groups are created using the data loader:

  - For the Template Groups where the site reference is set to Global, the Template Groups can contain ML Templates for any Site, and Global ML Templates.
  - For the Template Groups where the site reference is assigned to Site X, the Template Groups can contain Global ML Templates and ML Templates with Site X.
  - When a Global Template Group is applied to a asset assigned to Site X, only the Global ML Templates and Site X ML Templates will be applied.
- **Measurement Location Templates**: The data loader will create one Measurement Location Template record for each row in the data loader workbook. If the import worksheet specifies a Template ID value that matches the Template ID of an existing Measurement Location Template record, the existing record will be updated. If the worksheet specifies values for Category or Allowable Value that do not already exist in the database for the specified type (numeric or character) of Measurement Location, the record will not be imported.

  The Measurement Location Templates will be loaded into GE Digital APM, and will be filtered based on the designated site name in the Site Reference Name field.
- **Checkpoint Template Sequence**: The data loader will create one Checkpoint Template Sequence record for each row in the worksheet. Since the unique

identification of a Checkpoint Template Sequence record includes all its fields, it is not possible to update existing Checkpoint Template Sequence records using the Rounds Templates Data Loader. Updates to existing Template Groups to add or reorder the related Measurement Location Templates must be performed using the Rounds Designer user interface.

Each Checkpoint Template Sequence record will take the same Site Reference Name that is designated to the Template Group to which it is assigned.

- **Checkpoint Conditions**: The data loader will create one Checkpoint Condition record for each row in the Checkpoint Condition worksheet. This worksheet defines the conditions under which the successor checkpoints for Checkpoint Conditions are displayed in Rounds Data Collection. This worksheet also works together with the Measurement Location worksheet to determine the checkpoint sequence for Template Groups with Checkpoint Conditions.

  The values specified in the CPC ID field in this worksheet are used by the Checkpoint Template Sequence worksheet to specify when checkpoints have predecessor Checkpoint Conditions. Additionally, this worksheet uses the values specified in the CTS ID field in the Checkpoint Template Sequence worksheet to specify predecessor checkpoints for Checkpoint Conditions.

  Note: For more details regarding how to create a Template Group with Checkpoint Conditions using the Rounds Templates data loader workbook, see the Example Rounds Templates Data Loader Workbook with Checkpoint Conditions topic.

Rounds Routes Data Loader

When importing data using the Rounds Routes Data Loader, you can:

- Create Route, Measurement Locations, Lubrication Requirement and Checkpoint task records.
- Assign or unassign a Security User to the Route.

When importing data using the Rounds Routes Data Loader, this data loader will create records as follows:

- **Routes:** The data loader will create one Route record for each row in the Route worksheet. The Next Date field on the Route record is populated automatically by existing rules based on the value in the Schedule column. The user can however overwrite the Next Date Value by providing a value in the worksheet. If the Schedule is invalid, the Route record will not be created. The Route ID column in the Data Loader workbook is used for identifying the Routes. If a Route with this ID is

already present in the database, it will update the Route.

The Route created will be loaded into GE Digital APM, and will be filtered based on the designated site name in the Site Reference Name field.

Note: If you want to set the site reference, to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.

Note: Adding a value in the Schedule column is not mandatory.

- **Security Users:** The data loader will create relationships assigning each Route, identified by Route ID, to each Security User listed.

  When you specify a Route ID, only the corresponding users specified in this sheet will be assigned to the Route, regardless of whether other users were previously assigned to it.

  For example, if three users are listed, and you want five users to be listed (i.e., you want to add two users), you must include all five users in the sheet. If you include only the two new users, the original three users will be removed from the Route.

  If you include a Route ID in this sheet with *no* Security Users listed, all existing user assignments will be removed.

  Note that the relationship created is between the Route and the Human Resource record linked to the Security User; therefore, the Human Resource records must already exist before the data loader is used.

- **Measurement Locations / Lubrication Requirement records / Checkpoint Tasks:** The data loader will create one Measurement Location or a Lubrication Requirement record and one related Checkpoint Task record for each row of the Measurement Location import worksheet. Measurement Location records / Lubrication Requirement records are processed in batches using the Route ID. The MLs/ LRs are identified by the Checkpoint ID column. If a Measurement Location / Lubrication Requirement with this Checkpoint ID is already present in the database, then the ML will be updated.

  The Next Date, Non-Compliance Date, and the Non-Compliance Next Check Date fields on the Checkpoint Task record will be populated automatically by existing rules based on the value in the Schedule column. If the Schedule is invalid, the record will not be created.

  Note: Adding a value in the Schedule column is not mandatory.

Each Measurement Location or Lubrication Requirement record will take the same Site Reference Name that is designated to the predecessor Asset. If there no Site Reference Name that is assigned to the Asset, the ML or LR takes the Site Reference Name from the Route to which the ML or LR is assigned.

- **Sequence Number:** The User can provide the Sequence number for the Measurement Locations/ Lubrication Requirement records under a Route in the Sequence column on the import worksheet. The data loader will consider the sequence provided and order the Measurement Locations / Lubrication Requirement records based on it. However, if there is any random / incorrect / blank / non-sequential numbers in this column, the data loader will correct them and place them sequentially while importing them. Any new insertion of Measurement Locations / Lubrication Requirement records under a Route will always be at the end of the Route with maximum sequence number under the Route. The data in the Sequence column is ignored when the Measurement Location / Lubrication Requirement record is standalone or the Measurement Location / Lubrication Requirement record is being updated.

  Note: Re-sequencing the Measurement Locations and Lubrication Requirements under a Route is possible using Data Loaders in V4.1.5.0. or later.

  The data loader will populate an Asset entity key into the new Measurement Location / Lubrication Requirement records, based on matching the value specified in the Related Asset Key column (i.e., Functional Location ID for FLOCs or Equipment Technical Number for Equipment) in the Measurement Location import worksheet. If there is no Related Asset Key, it will use the related Asset ID field to search the Equipment and Functional Location families for a matching record and link it to the Measurement Location / Lubrication Requirement record and also populate the Related Asset Key.

  Note: The Asset ID is not required. If a matching Asset ID is not found, the ML is created without linking to any asset and a warning is added to the import log.

  - Provided that the Measurement Location / Lubrication Requirement record has received an Asset Key, the family rules will populate additional information in the Measurement Location / Lubrication Requirement records and create a relationship between the asset (predecessor) and Measurement Location / Lubrication Requirement records (successor).
  - The data loader will link each new Measurement Location / Lubrication Requirement record to an existing Route record that matches the value specified in the Route ID column. If a matching Route ID is not found, the

records will not be created.

- Standalone Measurement Locations / Lubrication Requirement records can be created without being linked to a Route by specifying <Dummy ID> as the Route ID and the Route Batch ID as 1000000000.
- The data loader will link each Measurement Location / Lubrication Requirement record to the Action record which is specified by the Action ID column and is related to the Strategy record specified by the Strategy ID Column.

If the Asset Health Indicator service is configured and started, Health Indicator records will be added automatically for each imported Measurement Location record that is linked to an Equipment or Functional Location.

Note: Health Indicator records are not added for Lubrication Requirements, since there is no Health Indicator Mapping.

- **Checkpoint Conditions**: The data loader will create one Checkpoint Condition record for each row in the Checkpoint Condition worksheet. This worksheet defines the conditions under which the successor checkpoints for Checkpoint Conditions are displayed in Rounds Data Collection. This worksheet also works together with the Measurement Location worksheet to determine the Route sequence for Routes with Checkpoint Conditions.

  The following table shows the relationships between fields in this worksheet and fields in the Measurement Location worksheet that determine which checkpoints precede or succeed which Checkpoint Conditions.

Measurement Location Worksheet Fields	Checkpoint Condition Worksheet Fields
ML Identifier (ROUNDS_ML_ID)	Parent ML Batch ID (PARENT_ROUNDS_ML_ID)
Checkpoint ID (MI_CHECK_PT_CHEC_ID_C)	Parent ML ID (MI_CHECK_PT_PR_CHEC_ID_C)
Parent Condition Batch ID (MI_CHKPCOND_BATCH_ID)	Condition Batch ID (MI_CHKPCOND_BATCH_ID_C)
Parent Condition Identifier (MI_CHKPCOND_ID_C)	Condition Identifier (MI_CHKPCOND_ID_C)

When the values in the Parent ML Batch ID and Parent ML ID fields for a Checkpoint Condition match the values in the ML Identifier and Checkpoint ID fields,

respectively, for a checkpoint, this indicates that the Checkpoint Condition is a successor of the checkpoint.

When the values in the Condition Batch ID and Condition Identifier fields for a Checkpoint Condition match the values in the Parent Condition Batch ID and the Parent Condition Identifier fields, respectively, for a checkpoint, this indicates that the Checkpoint Condition is a predecessor of the checkpoint.

Note: For more details regarding how to create a Route with Checkpoint Conditions using the Rounds Route data loader workbook, see the Example Rounds Route Data Loader Workbook with Checkpoint Conditions topic.

Rounds Readings Data Loader

When importing data using the Rounds Readings Data Loader, the data loader will create one Reading record for each row of the import worksheet. The data loader will attempt to link each reading to a checkpoint record (i.e., Measurement Location record or Lubrication Requirement record) based on the related Measurement Location and Lubrication Requirement records specified in the import worksheet. To properly identify the checkpoint to which Readings are linked, the import must specify either the Entity Key or the Checkpoint ID. If no matching checkpoint is found, the reading is not imported. The Asset ID and Unit of Measure (if applicable) will be populated on the Reading based on the related checkpoint, and the fields on the related Checkpoint Task will be updated according to the applicable schedule.

Each Reading record will take the same Site Reference Name that is designated to the Measurement Location or Lubrication Requirement to which it is assigned.

About the Rounds Data Loaders Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbooks are constructed.

In order to import data using the Rounds Data Loaders, GE Digital provides separate data loader workbooks for:

- Rounds Allowable Values
- Rounds Templates
- Rounds Routes
- Rounds Readings

The workbooks support the baseline Rounds functionality in GE Digital APM. The workbooks must be used to perform the data load. You can modify the data loader workbooks to include custom fields used by your organization.

Each data loader workbook contains one worksheet for each node that will be populated in the data model.

Each worksheet in these data loader workbooks contain field values that must be mapped to the appropriate GE Digital APM family/field combination. The individual sections in this document specify the source and target fields and relationships required between predecessors and successor.

The list of fields tabulated is not exhaustive. The user can add additional field columns to the worksheets and, provided that the field columns are properly mapped within the worksheets, the upload will still be successful.

Data Loader Batch Fields

The Rounds Data Loaders workbooks include columns of data that are used to identify batches of related records. These values are not imported to a field in the GE Digital APM database. Generally, these will be the first few columns in each worksheet. They each use a prefix that identifies the relevant record type being imported, whereas columns that will be imported have IDs that match the field IDs in GE Digital APM, which generally use the prefix MI_.

Rounds Allowable Values Data Loader Workbook

On the worksheet, you will specify the allowable values that will be used in Measurement Location Templates and Measurement Locations.

Field Caption	Field ID	Data Type (Length)	Comments
Allowable Value Batch ID	OPR_AL_VL_ID	Character (50)	This field is required for identification during the data load process and must be unique. It is not imported to GE Digital APM.
Type	MI_OPR_AL_VL_TYPE_CHR	Character (50)	This field is required. The valid values for this field are: • Character • Numeric
Category	MI_OPR_AL_VL_CATEG_CHR	Character (50)	This field is required.
Value	MI_OPR_AL_VL_VALUE_CHR	Character (50)	This field is required.

Rounds Templates Data Loader Workbook

Worksheet	Description
Template Group Worksheet (MI_DTACLTMP)	This worksheet is used to specify the Template Groups.
Measurement Location Worksheet (MI_ML_TMPLT)	This worksheet is used to specify Measurement Location Templates that will be related to Template Groups. Note that no relationships are created when this worksheet is imported. The arrangement of Measurement Location Templates is defined by Checkpoint Template Sequence records which are created when the next worksheet is imported.
Checkpoint Template Sequence Worksheet (MI_HSCPTMP)	This worksheet is used to specify Checkpoint Template Sequence records that define how ML Templates are arranged into Template Groups. Note that an ML Template can appear in multiple Template Groups, and it can appear in a Template Group more than once.

Worksheet	Description
Lubrication Requirement Worksheet (MI_LR_TMPLT)	This worksheet is used to define Lubrication Requirement Templates. Note that no relationships are created when this worksheet is imported.
Checkpoint Condition Worksheet (MI_CHKPCOND)	This worksheet is used to specify Checkpoint Conditions that will be related to checkpoints in Template Groups.

Template Group Worksheet (MI_DTACLTMP)

Field Caption	Field ID	Data Type (Length)	Comments
Template Group Batch ID	ROUNDS_MLTG_ID	Character (50)	This field is required for identification during the data load process and must be unique. It is not imported to GE Digital APM.
ID	MI_DTACLTMP_ID_C	Character (50)	This field is required and must be unique.
Site Reference Name	MI_SITE_NAME	Character (50)	This field is required and must match an existing Site name. **Note:** If you want to set the site reference to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.
Description	MI_DTACLTMP_DESCR_C	Character (255)	Please provide a brief description.

Measurement Location Worksheet (MI_ML_TMPLT)

Field Caption	Field ID	Data Type (Length)	Comments
Template Group Batch ID	ROUNDS_MLTG_ID	Character (50)	This field is required for identification during the data load process. It should match the ID of the Template Group to which the ML Template will be linked. Use <Dummy ID> if you want to import standalone records not linked to a Template Group. Not imported to GE Digital APM.
Template Item ID	ROUNDS_MLT_ID	Character (50)	This field is required for identification during the data load process. Not imported to GE Digital APM.
Template ID	MI_ML_TMPLT_TEMPL_ID_C	Character (50)	This field is required and must be unique.
ML Type	MI_ML_TMPLT_MEAS_LOC_TYPE_C	Character (50)	This field is required. The valid values for this field are: • Character • Numeric
Site Reference Name	MI_SITE_NAME	Character (50)	This field is required and must match an existing Site name. **Note:** If you want to set the site reference to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.
Description	MI_ML_TMPLT_DESC_C	Character (255)	Please provide a brief description.

Field Caption	Field ID	Data Type (Length)	Comments
Unit of Measure	MI_ML_TMPLT_UOM_C	Character (50)	Must be a valid value in the global Unit of Measure list. Disabled if the ML Type field is Character.
Status	MI_ML_TMPLT_STAT_C	Character (50)	The default value for this field is Active.
Schedule	MI_ML_TMPLT_SCHEDULE_C	Character (255)	If specified, must be valid JSON Schedule.
Checkpoint Locked	MI_CP_TMPLT_LOCKED_L	Boolean	The default value for this field is False.
Requires Equipment Shutdown	MI_CP_TMPLT_REQU_EQUI_SHUT_FLG	Logical	The default value for this field is False.
Category	MI_ML_TMPLT_CATEG_C	Character (50)	All specified values must match the Category field in pre-existing Allowable Value records where the Category and Type match the Category and ML Type defined for this ML.
Allowable Values	MI_ML_TMPLT_ALLOW_VAL_C	Multi-value, max 10 values, Character (255)	All specified Values must match the Value field in pre-existing Allowable Value records where the Category and Type match the Category and ML Type defined for this MLT. The | (pipe) character is used to separate each allowable value.

Field Caption	Field ID	Data Type (Length)	Comments
Lower Level 1 Action	MI_ML_TMPLT_LO_LVL1_ACT_C	Character (50)	None
Lower Level 1 Character Value	MI_ML_TMPLT_LO_LVL1_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the MLT. This field is disabled if the ML Type field is Numeric.
Lower Level 1 Numeric Value*	MI_ML_TMPLT_LO_LVL1_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Lower Level 1 Message	MI_ML_TMPLT_LO_LVL1_MSG_C	Character (50)	None
Lower Level 2 Action	MI_ML_TMPLT_LO_LVL2_ACT_C	Character (50)	None
Lower Level 2 Character Value	MI_ML_TMPLT_LO_LVL2_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the MLT. This field is disabled if the ML Type field is Numeric.
Lower Level 2 Numeric Value*	MI_ML_TMPLT_LO_LVL2_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.

Field Caption	Field ID	Data Type (Length)	Comments
Lower Level 2 Message	MI_ML_TMPLT_LO_LVL2_MSG_C	Character (50)	None
Lower Level 3 Action	MI_ML_TMPLT_LO_LVL3_ACT_C	Character (50)	None
Lower Level 3 Character Value	MI_ML_TMPLT_LO_LVL3_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the MLT. This field is disabled if the ML Type field is Numeric.
Lower Level 3 Numeric Value*	MI_ML_TMPLT_LO_LVL3_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Lower Level 3 Message	MI_ML_TMPLT_LO_LVL3_MSG_C	Character (50)	None
Upper Level 1 Action	MI_ML_TMPLT_UP_LVL1_ACT_C	Character (50)	None
Upper Level 1 Character Value	MI_ML_TMPLT_UP_LVL1_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the MLT. This field is disabled if the ML Type field is Numeric.

Field Caption	Field ID	Data Type (Length)	Comments
Upper Level 1 Numeric Value*	MI_ML_TMPLT_UP_LVL1_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Upper Level 1 Message	MI_ML_TMPLT_UP_LVL1_MSG_C	Character (50)	None
Upper Level 2 Action	MI_ML_TMPLT_UP_LVL2_ACT_C	Character (50)	None
Upper Level 2 Character Value	MI_ML_TMPLT_UP_LVL2_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the MLT. This field is disabled if the ML Type field is Numeric.
Upper Level 2 Numeric Value*	MI_ML_TMPLT_UP_LVL2_ALRT_N	Numeric	None. This field is disabled if the ML Type field is Character.
Upper Level 2 Message	MI_ML_TMPLT_UP_LVL2_MSG_C	Character (50)	None
Upper Level 3 Action	MI_ML_TMPLT_UP_LVL3_ACT_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Upper Level 3 Character Value	MI_ML_TMPLT_UP_LVL3_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the MLT. This field is disabled if the ML Type field is Numeric.
Upper Level 3 Numeric Value*	MI_ML_TMPLT_UP_LVL3_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Upper Level 3 Message	MI_ML_TMPLT_UP_LVL3_MSG_C	Character (50)	None
Product	MI_ML_TMPLT_PRODUCT_C	Character (50)	None
Minimum Valid Value	MI_ML_TMPLT_MIN_VLDVAL_N	Numeric	None. This field is disabled if ML type field is Character.
Maximum Target Value	MI_ML_TMPLT_MAX_TRGVAL_N	Numeric	None. This field is disabled if ML type field is Character.
Minimum Target Value	MI_ML_TMPLT_MIN_TRGVAL_N	Numeric	None. This field is disabled if ML type field is Character.

Field Caption	Field ID	Data Type (Length)	Comments
Maximum Valid Value	MI_ML_TMPLT_MAX_VLDVAL_N	Numeric	None. This field is disabled if ML type field is Character.
More Information	MI_ML_TMPLT_MORE_INFO_C	Character (255)	None

* For a Numeric ML Template, the limit values must be in descending order (i.e., lower level 3<lower level 2<lower level 1<upper level 1<upper level 2<upper level 3).

Checkpoint Template Sequence Worksheet (MI_HSCPTMP)

Field Caption	Field ID	Data Type (Length)	Comments
Template Group Batch ID	ROUNDS_MLTG_ID	Character (50)	This field is required for identification during the data load process. It must match the ID of the Template Group to which the Checkpoint Template Sequence record will be linked. Not imported to GE Digital APM.
CTS ID	CTS_ID	Character (50)	This field is required for identification during the data load process and must be unique. Not imported to GE Digital APM.

Field Caption	Field ID	Data Type (Length)	Comments
Group ID/Predecessor CTC ID	MI_HSCPTMP_PRED_ENTY_KEY_N	Character (50)	This field is required. • If the checkpoint does not have a predecessor Checkpoint Condition, you should specify the Predecessor Template Group ID as defined in the ROUNDS_MLTG_ID column of the Template Groups sheet in the current data loader workbook. The data loader will automatically populate the field on the record with the relevant Entity Key. • If the checkpoint does have a predecessor Checkpoint Condition, specify the CTC ID for the predecessor Checkpoint Condition in this field.
Template ID	MI_HSCPTMP_SUCC_ENTY_KEY_N	Character (50)	This field is required. You should specify the Template ID as defined in the ROUNDS_MLT_ID column of the Templates sheet in the current data loader workbook. The data loader will automatically populate the field on the record with the relevant Entity Key.
Sequence	MI_HSCPTMP_SEQ_N	Numeric	This field is required and must be unique within the collection of Checkpoint Template Sequence records associated with any Template Group.
Template Group ID	MI_HSCPTMP_REL_TMPG_KEY_N	Numeric	This field is required for identification during the data load process and must match the ID of the template group to which the Checkpoint Template Sequence is being applied. Not imported GE Digital APM.

Checkpoint Condition Worksheet (MI_CHKPCOND)

Field Caption	Field ID	Data Type (Length)	Comments
Template Group Batch ID	ROUNDS_MLTG_ID	Character (50)	This field is required for identification during the data load process. It must match the ID of the Template Group to which the Checkpoint Template Sequence record will be linked. Not imported to GE Digital APM.
CPC ID	CPC_ID	Character (50)	This field defines the ID for the Checkpoint Condition. If you want to include conditions in your template, this field is required and must be unique.
Predecessor CTS ID	MI_CHKPCOND_PRED_KEY_N	Numeric	Use this field to determine the predecessor checkpoint for the Checkpoint Condition. This field specifies the Checkpoint Template Sequence ID (CTS ID) defined in the Checkpoint Template Sequence worksheet for the predecessor checkpoint.

Field Caption	Field ID	Data Type (Length)	Comments
Sequence Number	MI_CHKPCOND_SEQ_NUM_N	Numeric	This field defines the sequence for sibling Checkpoint Conditions (that is, Checkpoint Conditions with the same Predecessor CTS ID). If you are adding a Checkpoint Condition for the first time: • If no value is specified in this field, a value will be automatically assigned to the Checkpoint Condition during the data load process. • If you specify a value in this field, the sequence that you specify will be used to determine the order of sibling Checkpoint Conditions. If you are updating an existing Checkpoint Condition: • If no value is specified in this field, the existing sequence will remain intact. • If you specify a value in this field, the sequence that you specify will be used to determine the order of sibling Checkpoint Conditions.
Template Group ID	MI_HSCPTMP_REL_TMPG_KEY_N	Numeric	This field is required for identification during the data load process and must match the ID of the template group to which the Checkpoint Template Sequence is being applied. Not imported GE Digital APM.

Field Caption	Field ID	Data Type (Length)	Comments
Field Name	MI_CHKPCOND_FLD_NAM_C	Character (50)	This field behaves differently depending on whether the Predecessor CTS ID refers to a Measurement Location or a Lubrication Requirement: • If the Predecessor CTS ID refers to a Measurement Location, this field specifies the category for the Measurement Location. • If the Predecessor CTS ID refers to a Lubrication Requirement, this field specifies the lubricant type for the Lubrication Requirement.
Field Value for Character Type	MI_CHKPCOND_FLD_VAL_CHAR_C	Character (250)	This field specifies the reading value that, for a predecessor Measurement Location with an ML Type of Character, determines whether the condition has been met to display successor checkpoints.
Field Value for Numeric Type	MI_CHKPCOND_FLD_VAL_NUM_N	Numeric	This field specifies the reading value that, for a predecessor Measurement Location with an ML Type of Numeric, determines whether the condition has been met to display successor checkpoints.

Field Caption	Field ID	Data Type (Length)	Comments
Possible Condition	MI_CHKPCOND_POSS_COND_C	Character (200)	This field specifies the relationship between the predecessor checkpoint value and the value in the Checkpoint Condition Field Value field that determines whether to display successor checkpoints in Rounds Data Collection. If the predecessor checkpoint has a Type value of Numeric, enter one of the following values: • < • <= • = • >= • > If the predecessor checkpoint has a Type value of Character, enter the following value in this field: `is`.
Type	MI_CHKPCOND_TYPEC	Character (50)	This field is required. The valid values for this field are: • Character • Numeric

Lubrication Requirement Worksheet (MI_LR_TMPLT)

Field Caption	Field ID	Data Type (Length)	Comments
Template Group Batch ID	ROUNDS_MLTG_ID	Character (50)	Lubrication Requirement records can be created without being linked to a Route by specifying <Dummy ID> as the Route ID and the Route Batch ID as 1000000000. Not imported to GE Digital APM. You can create orphan Lubrication Requirement Templates using this DL.
Template Item ID	ROUNDS_LRT_ID	Character (50)	This field is required for identification during the data load process. Not imported to GE Digital APM.
Template ID	MI_ML_TMPLT_TEMPL_ID_C	Character (50)	This field is required and must be unique.
LR Type	MI_LR_TMPLT_LR_TYPE_C	Character (50)	This field is required. The valid values for this field are: • Character • Numeric
Description	MI_ML_TMPLT_DESC_C	Character (255)	Please provide a brief description.
Unit of Measure	MI_ML_TMPLT_UOM_C	Character (50)	The field must be a valid value in the global Unit of Measure list. This field is disabled if the LR Type field is Character.
Status	MI_ML_TMPLT_STAT_C	Character (50)	The valid values for this field are Active or Inactive. This field is set to Active by default.

Field Caption	Field ID	Data Type (Length)	Comments
Schedule	MI_ML_TMPLT_SCHEDULE_C	Character (255)	If specified, must be valid JSON Schedule.
Checkpoint Locked	MI_CP_TMPLT_LOCKED_L	Logical	The default value for this field is False.
Requires Equipment Shutdown	MI_CP_TMPLT_REQU_EQUI_SHUT_FLG	Logical	The default value for this field is False.
Lubricant	MI_LR_TMPLT_LUBR_C	Character (50)	This field must be a pre-existing Lubricant value in the Lubricant family where the Method and Manufacturer are as specified for this LR Template.
Number of Points	MI_LR_TMPLT_NO_OF_POINTS_N	Numeric	None
Capacity	MI_LR_TMPLT_CAP_N	Numeric	None
Quantity	MI_LR_TMPLT_QTY_N	Numeric	None
Method	MI_LR_TMPLT_METHOD_C	Character (50)	This field must be a pre-existing Method defined in a Lubricant record.

Field Caption	Field ID	Data Type (Length)	Comments
Skip Reason	MI_LR_TMPLT_SKIP_REAS_C	Character (50)	None
Change Out Triggers Update?	MI_LR_TMPLT_CH_OUT_TRIG_UPD_L	Logical	The default value for this field is False.
Component	MI_LR_TMPLT_COMP_C	Character (50)	None
Lubricant Manufacturer	MI_LR_TMPLT_LUBR_MFR_C	Character (50)	None
Capacity Unit Of Measure	MI_LR_TMPLT_CAPTY_UOM_C	Character (50)	None
Priority	MI_LR_TMPLT_PRIOR_C	Character (50)	None

Rounds Routes Data Loader Workbook

Worksheet	Description
Route Worksheet (MI_ROUTE000)	This worksheet is used to specify Route records.

Worksheet	Description
Security User Worksheet (MI_Security User)	This worksheet is used to assign a security user for the Route identified by Route Id in each row in the Security User (MI_Security User) worksheet. You can also unassign all the Security Users from a Route by leaving the User ID field blank. You may leave all rows blank to make no Route assignment changes.
Measurement Location Worksheet (MI_MEAS_LOC)	This worksheet is used to specify the measurement locations that will be linked to each Route. You can import Measurement Locations that are not linked to a Route by specifying <Dummy ID> for the Route ID. Note that Measurement Locations may be related to a Measurement Location Template. If one is specified, the values from the template will be used to populate the fields in the Measurement Location. Required values that are provided from the Measurement Location Template need not be specified again in this worksheet. If this worksheet specifies a value for any field that is populated from the Measurement Location Template, it will be over-written with the value from the Measurement Location Template.
Checkpoint Task Worksheet (MI_CP_TASK0)	This worksheet is used to specify the schedule information to be added to the Checkpoint Task records that will be created for each Measurement Location that is imported. Note that it is not required to specify any data on this worksheet. If no data is specified, the Checkpoint Task records will be created with the schedule information from the Measurement Location Template specified in the related Measurement Location.
Checkpoint Condition Worksheet (MI_CHKPCOND)	This worksheet is used to specify Checkpoint Conditions that will be related to checkpoints in Rounds Routes.

Route Worksheet (MI_ROUTE000)

Field Caption	Field ID	Data Type (Length)	Comments
Route Batch ID	ROUNDS_ROUTE_ID	Character (50)	This field is required for identification during the data load process and must be unique. Not imported to GE Digital APM.
Route Id	MI_ROUTE000_ROUTE_ID_C	Character (50)	This field is required and must be unique, • When you use the data loader to create Route, Measurement Locations and Checkpoint task records. • When you use the data loader to create Route, Measurement Locations and Checkpoint task records and assign the security users to Routes. **Note:** This field is **not** required and may not be populated on this worksheet when you **only** assign or un-assign the security users to Routes.
Site Reference Name	MI_SITE_NAME	Character (50)	This field is required and must match an existing Site name **Note:** If you want to set the site reference to be a Global Site Reference, enter the constant '*Global*' in the MI_SITE_NAME column on the spreadsheet.
Route Description	MI_ROUTE000_ROUTE_DESC_C	Character (125)	Please provide a brief description. **Note:** If you are using a Windows Mobile Device, GE Digital recommends that you do not enter Route descriptions longer than 40 characters.

Field Caption	Field ID	Data Type (Length)	Comments
Status	MI_ROUTE000_STAT_C	Character (50)	The valid values for this field are Active or Inactive. The default value for this field is Inactive.
Schedule	MI_ROUTE000_SCHED_C	Character (2000)	If specified, must be valid JSON Schedule definition. **Note:** To enable users to copy the JSON schedule text, an alternative Route with schedule datasheet is provided showing the Schedule Text (copy/paste enabled) field.
Route Scan ID	MI_ROUTE000_BARCD_ID_C	Character (50)	This field is required and must be unique.
Next Date	MI_ROUTE000_NEXT_DATE_D	Date	UTC time formatted as yyyy-mm-dd hh:mm:ss.
Last Date	MI_ROUTE000_LAST_DATE_D	Date	UTC time formatted as yyyy-mm-dd hh:mm:ss.

Security User Worksheet (MI_Security User)

Field Caption	Field ID	Data Type (Length)	Comments
Route Batch ID	ROUNDS_ROUTE_ID	Character (50)	This field is required for identification during the data load process and must be unique. Not imported to GE Digital APM.

Field Caption	Field ID	Data Type (Length)	Comments
Route Id	MI_ROUTE000_ROUTE_ID_C	Character (50)	This field is required and must be unique. The field needs to be populated on this worksheet when you are assigning the security users to Routes.
User ID	SEUS_ID	Character (50)	This field is required for assigning the User to the Route during the load process and must be unique. The Security User and the corresponding Human Resource records must already be part of the baseline database. If the field is left blank, the Route will be un-assigned.

Measurement Location Worksheet (MI_MEAS_LOC)

Field Caption	Field ID	Data Type (Length)	Comments
Route Batch ID	ROUNDS_ROUTE_ID	Character (50)	This field is required for identification during the data load process. It should match the ID of the Route to which the Measurement Location record will be linked. Use <Dummy ID> if you are importing standalone Measurement Location records. It is not imported to GE Digital APM.
ML Identifier	ROUNDS_ML_ID	Numeric	This field is required for identification during the data load process and must be unique. It is not imported to GE Digital APM.
Checkpoint ID	MI_CHECK_PT_CHEC_ID_C	Character (50)	This field is required and must be unique. If the value matches an existing Checkpoint ID, the ML record will be updated, otherwise a new ML record will be created.

Field Caption	Field ID	Data Type (Length)	Comments
Parent Condition Batch ID	MI_CHKPCOND_BATCH_ID	Character (50)	This field is required only if the checkpoint has a parent Checkpoint Condition. If the checkpoint has a predecessor Checkpoint Condition, this field is used for identification during the data load process and must match the batch ID of the predecessor Checkpoint Condition. Not imported to GE Digital APM.
Parent Condition Identifier	MI_CHKPCOND_ID_C	Character (50)	This field is required only if the checkpoint has a parent Checkpoint Condition. If the checkpoint has a predecessor Checkpoint Condition, this field is used for identification during the data load process and must match the ID of the predecessor Checkpoint Condition. Not imported to GE Digital APM.
ML Type	MI_MEAS_LOC_MEAS_LOC_TYPE_C	Character (50) Numeric	This field is required if Is LR? column contains False or is empty. The valid values for this field are Character or Numeric. The ML Type of the Measurement Location must match the ML Type of the template specified by the Template field, if applicable.
LR Type	MI_MEAS_LOC_MEAS_LOC_TYPE_C	Character (50)	This field is required if Is LR? column contains True. The valid values for this field are Checkoff, Changeout and Tracking. The LR Type of the Lubrication Requirement must match the LR Type of the template specified by the Template ID field, if applicable.
Is LR?	ROUNDS_CHECK_PT_IS_LR	Logical	The default value of this field is False. Enter True to specify that a Lubrication Requirement is being loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Description	MI_MEAS_LOC_DESC_C	Character (255)	Please provide a brief description.
Bluetooth Measurement Type	MI_MEAS_LOC_BT_MEAS_TYPE_C	Character (255)	None
Checkpoint Locked	MI_CHECK_PT_LOCKED_L	Logical	The default value of this field is False.
Requires Equipment Shutdown	MI_CP_TMPLT_REQU_EQUI_SHUT_FLG	Logical	The default value for this field is False.
Unit of Measure	MI_MEAS_LOC_UOM_C	Character (50)	Must be a valid value in the global Unit of Measure list. This field is disabled if the ML Type field is Character.
Template	MI_MEAS_LOC_TEMPL_C	Character (50)	This field is required and must be unique. Must match an existing ML Template ID. The ML Type of the template specified by the ML Template ID must match the ML Type of Measurement Location, if applicable.
Related Asset Key	MI_CHECK_PT_REL_ASSET_KEY_N	Numeric	If provided, must be the entity key of an existing Equipment or Functional Location record. The checkpoint will be linked to this asset.
Scan ID	MI_CHECK_PT_BARCD_ID_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Related Asset Id	MI_MEAS_LOC_RELAT_ASSET_ID_C	Character (50)	If this value matches an existing Equipment ID (for Equipment) or Functional Location (for Functional Locations) the checkpoint will be linked to this asset.
Asset Description	MI_MEAS_LOC_ASSET_DESCR_C	Character (50)	None
Status	MI_MEAS_LOC_STAT_C	Character (50)	The valid values for this field are Active or Inactive. The default value for this field is Active.
Sequence	MI_MEAS_LOC_SEQ_N	Numeric	This field is not required but if specified, it must be unique on the Route.
Category	MI_MEAS_LOC_CATEG_C	Character (50)	Must match the Category field on an existing Allowable Value record, where the Type field matches the ML Type value specified.
Allowable Values	MI_MEAS_LOC_ALLOW_VAL_C	Multi-value, max 10 values, Character (255)	All specified Values must match the Value field in pre-existing Allowable Value records where the Category and Type match the Category and ML Type defined for this ML. The | (pipe) character is used to separate each allowable value.
Lower Level 1 Action	MI_MEAS_LOC_LO_LVL1_ACT_C	Character (50)	None
Lower Level 1 Character Value	MI_MEAS_LOC_LO_LVL1_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the ML. This field is disabled if the ML Type field is Numeric.

Field Caption	Field ID	Data Type (Length)	Comments
Lower Level 1 Message	MI_MEAS_LOC_LO_LVL1_MSG_C	Character (50)	None
Lower Level 2 Action	MI_MEAS_LOC_LO_LVL2_ACT_C	Character (50)	None
Lower Level 2 Character Value	MI_MEAS_LOC_LO_LVL2_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the ML. This field is disabled if the ML Type field is Numeric.
Lower Level 2 Message	MI_MEAS_LOC_LO_LVL2_MSG_C	Character (50)	None
Upper Level 3 Numeric Value*	MI_MEAS_LOC_UP_LVL3_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Upper Level 2 Numeric Value*	MI_MEAS_LOC_UP_LVL2_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Upper Level 1 Numeric Value*	MI_MEAS_LOC_UP_LVL1_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Lower Level 1 Numeric Value*	MI_MEAS_LOC_LO_LVL1_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.

Field Caption	Field ID	Data Type (Length)	Comments
Lower Level 2 Numeric Value*	MI_MEAS_LOC_LO_LVL2_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Lower Level 3 Numeric Value	MI_MEAS_LOC_LO_LVL3_ALRT_N	Numeric	None. This field is disabled if ML type field is Character.
Lower Level 3 Action	MI_MEAS_LOC_LO_LVL3_ACT_C	Character (50)	None
Lower Level 3 Character Value	MI_MEAS_LOC_LO_LVL3_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the ML. This field is disabled if the ML Type field is Numeric.
Lower Level 3 Message	MI_MEAS_LOC_LO_LVL3_MSG_C	Character (50)	None
Upper Level 1 Action	MI_MEAS_LOC_UP_LVL1_ACT_C	Character (50)	None
Upper Level 1 Character Value	MI_MEAS_LOC_UP_LVL1_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the ML. This field is disabled if the ML Type field is Numeric.
Upper Level 1 Message	MI_MEAS_LOC_UP_LVL1_MSG_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Upper Level 2 Action	MI_MEAS_LOC_UP_LVL2_ACT_C	Character (50)	None
Upper Level 2 Character Value	MI_MEAS_LOC_UP_LVL2_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the ML. This field is disabled if the ML Type field is Numeric.
Upper Level 2 Message	MI_MEAS_LOC_UP_LVL2_MSG_C	Character (50)	None
Upper Level 3 Action	MI_MEAS_LOC_UP_LVL3_ACT_C	Character (50)	None
Upper Level 3 Character Value	MI_MEAS_LOC_UP_LVL3_ALRT_C	Character (50)	Must use one of the Allowable Values specified for the ML. This field is disabled if the ML Type field is Numeric.
Upper Level 3 Message	MI_MEAS_LOC_UP_LVL3_MSG_C	Character (50)	None
Product	MI_MEAS_LOC_PRODUCT_C	Character (50)	None
Maximum Target Value	MI_MEAS_LOC_MAX_TRGVAL_N	Numeric	None. This field is disabled if ML type field is Character.

Field Caption	Field ID	Data Type (Length)	Comments
Minimum Valid Value	MI_MEAS_LOC_MIN_VLDVAL_N	Numeric	None. This field is disabled if ML type field is Character.
Minimum Target Value	MI_MEAS_LOC_MIN_TRGVAL_N	Numeric	None. This field is disabled if ML type field is Character.
Maximum Valid Value	MI_MEAS_LOC_MAX_VLDVAL_N	Numeric	None. This field is disabled if ML type field is Character.
More Information	MI_MEAS_LOC_MORE_INFO_C	Character (255)	None
Download Stored Document	MI_MEAS_LOC_DWLD_STRD_DOC_L	Logical	The default value for this field is False.
Action ID	MI_MEAS_ACTION_ID_EXT	Character (50)	This field matches the Action ID (MI_ACTION_ID_C field) of an Action record that is linked to the Strategy identified by the value in the MI_MEAS_STRATEGY_EXT column. If no matching Strategy / Action combination is found, the Measurement Location is not linked to an Action.
Strategy ID	MI_MEAS_STRATEGY_EXT	Character (255)	This field matches the Strategy ID (MI_STRATEGY_ID_C field) of the Strategy (MI_STRATEGY family) containing the Action to which the Measurement Location will be linked.

Field Caption	Field ID	Data Type (Length)	Comments
Lubricant	MI_LUBR_REQ_LUBR_C	Character (50)	This field must be a pre-existing Lubricant value in the Lubricant family where the Method and Manufacturer are as specified for this LR.
Number of Points	MI_LUBR_REQ_NO_OF_POINTS_N	Numeric	None
Capacity	MI_LUBR_REQ_CAP_N	Numeric	None
Quantity	MI_LUBR_REQ_QTY_N	Numeric	None
Method	MI_LUBR_REQ_METHOD_C	Character (50)	This field must be a pre-existing Method defined in a Lubricant record.
Skip Reason	MI_LUBR_REQ_SKIP_REAS_C	Character (50)	None
Change Out Triggers Update?	MI_LUBR_REQ_CH_OUT_TRIG_UPD_L	Logical	The default value of this field is False.
Component	MI_LUBR_REQ_COMP_C	Character (50)	None
Lubricant Manufacturer	MI_LUBR_REQ_LUBR_MFR_C	Character (50)	This field must be a pre-existing value in a Lubricant record where the Method field is as specified for this LR.

Field Caption	Field ID	Data Type (Length)	Comments
Priority	MI_LUBR_REQ_PRIOR_C	Character (50)	None
Capacity Unit of Measure	MI_LUBR_REQ_CAPTY_UOM_C	Character (50)	None

Checkpoint Task Worksheet (MI_CP_TASK0)

Field Caption	Field ID	Data Type (Length)	Comments
Route Batch ID	ROUNDS_ROUTE_ID	Character (50)	This field is required for identification during the data load process. It should match the ID of the Route to which the Measurement Location record will be linked. Use <Dummy ID> if you are importing standalone Measurement Location records. Not imported to GE Digital APM.
ML Identifier	ROUNDS_ML_ID	Character (50)	This field is required for identification during the data load process and must be unique. Not imported to GE Digital APM.
Next Date	MI_TASK_NEXT_DATE_DT	Date	UTC time formatted as yyyy-mm-dd hh:mm:ss.
Schedule	MI_TASK_SCHEDULE_C	Character (255)	If provided, must be valid JSON Schedule definition. **Note:** To enable users to copy the JSON schedule text, an alternative Checkpoint Task with Schedule datasheet is provided showing the Schedule Text (copy/paste enabled) field.

Field Caption	Field ID	Data Type (Length)	Comments
Non-compliance Date	MI_CP_TASK0_NON_COMP_D	Date	UTC time formatted as yyyy-mm-dd hh:mm:ss.
Non Compliance Date Interval	MI_CP_TASK0_NONCMP_DT_INTR_NBR	Numeric	If provided, must be a positive integer.
Non Compliance Next Check Date	MI_CP_TASK0_NON_CMP_NXT_CHK_D	Date	UTC time formatted as yyyy-mm-dd hh:mm:ss.

Checkpoint Condition Worksheet (MI_CHKPCOND)

Field Caption	Field ID	Data Type (Length)	Comments
Route Batch ID	ROUNDS_MLTG_ID	Character (50)	This field is required for identification during the data load process. It must match the ID of the Route to which the Checkpoint Condition will be linked. Not imported to GE Digital APM.
Condition Batch ID	MI_CHKPCOND_BATCH_ID	Character (50)	This field specifies the batch ID for the Checkpoint Condition. This field is required for identification during the data load process and must be unique. Not imported to GE Digital APM.

Field Caption	Field ID	Data Type (Length)	Comments
Condition Identifier	MI_CHKPCOND_ID_C	Character (50)	This field is required for identification during the data load process and must be unique. Not imported to GE Digital APM.
Parent ML Batch ID	PARENT_ROUNDS_ML_ID	Numeric	This field is required for identification during the data load process and must match the ML Identifier of the predecessor checkpoint as defined in the Measurement Location worksheet. Not imported to GE Digital APM.
Parent ML ID	MI_CHECK_PT_PR_CHEC_ID_C	Character (50)	This field is required for identification during the data load process and must match the Checkpoint ID for the predecessor checkpoint as defined in the Measurement Location worksheet. Not imported to GE Digital APM.
Field Name	MI_CHKPCOND_FLD_NAM_C	Character (50)	This field behaves differently depending on whether the Predecessor CTS ID refers to a Measurement Location or a Lubrication Requirement: • If the Predecessor CTS ID refers to a Measurement Location, this field specifies the category for the Measurement Location. • If the Predecessor CTS ID refers to a Lubrication Requirement, this field specifies the lubricant type for the Lubrication Requirement.

Field Caption	Field ID	Data Type (Length)	Comments
Field Value for Character Type	MI_CHKPCOND_FLD_VAL_CHAR_C	Character (250)	This field specifies the reading value that, for a predecessor Measurement Location with an ML Type of Character, determines whether the condition has been met to display successor checkpoints.
Field Value for Numeric Type	MI_CHKPCOND_FLD_VAL_NUM_N	Numeric	This field specifies the reading value that, for a predecessor Measurement Location with an ML Type of Numeric, determines whether the condition has been met to display successor checkpoints.
Possible Condition	MI_CHKPCOND_POSS_COND_C	Character (200)	This field specifies the relationship between the predecessor checkpoint value and the value in the Checkpoint Condition Field Value field that determines whether to display successor checkpoints in Rounds Data Collection. If the predecessor checkpoint has a Type value of Numeric, enter one of the following values: • < • <= • = • >= • > If the predecessor checkpoint has a Type value of Character, enter the following value in this field: `is`.

Field Caption	Field ID	Data Type (Length)	Comments
Type	MI_CHKPCOND_TYPEC	Character (50)	This field is required. The valid values for this field are: • Character • Numeric
Sequence Number	MI_CHKPCOND_SEQ_NUM_N	Numeric	This field defines the sequence for sibling Checkpoint Conditions (that is, Checkpoint Conditions with the same Predecessor CTS ID). If you are adding a Checkpoint Condition for the first time: • If no value is specified in this field, a value will be automatically assigned to the Checkpoint Condition during the data load process. • If you specify a value in this field, the sequence that you specify will be used to determine the order of sibling Checkpoint Conditions. If you are updating an existing Checkpoint Condition: • If no value is specified in this field, the existing sequence will remain intact. • If you specify a value in this field, the sequence that you specify will be used to determine the order of sibling Checkpoint Conditions.

Rounds Readings Data Loader Workbook

On the worksheet, you will specify the Readings that you want to link to checkpoints (i.e., Measurement Locations or Lubrication Requirements). The related checkpoint must be identified by either the Entity Key or the Checkpoint ID.

Note: If you are importing Readings directly after importing the related checkpoints, you will need to use the Checkpoint ID.

When Readings are imported, the Status of the Reading is set, and the Checkpoint Task related to the Measurement Location or Lubrication Requirement is updated automatically. In order for the status of each Reading to be set as expected, Readings should be ordered earliest first on the worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Reading Batch ID	ROUNDS_READING_ID	Character (50)	This field is required.
Related ML Entity Key	MI_READING0_RELAT_ML_ENTIT_KEY_N	Numeric	This field must match the Entity Key of an existing Measurement Location or Lubrication Requirement. Either this field or Checkpoint ID is required.
Checkpoint ID	MI_CHECK_PT_CHEC_ID_C	Character (50)	This field must match the Checkpoint ID of an existing Measurement Location or Lubrication Requirement. Either this field or Related ML Entity Key is required.
Comment	MI_READING0_COMME_C	Character (255)	None
Action Taken	MI_READING0_ACTIO_TAKEN_C	Character (50)	Must use one of the Action Taken values specified for the related Measurement Location.

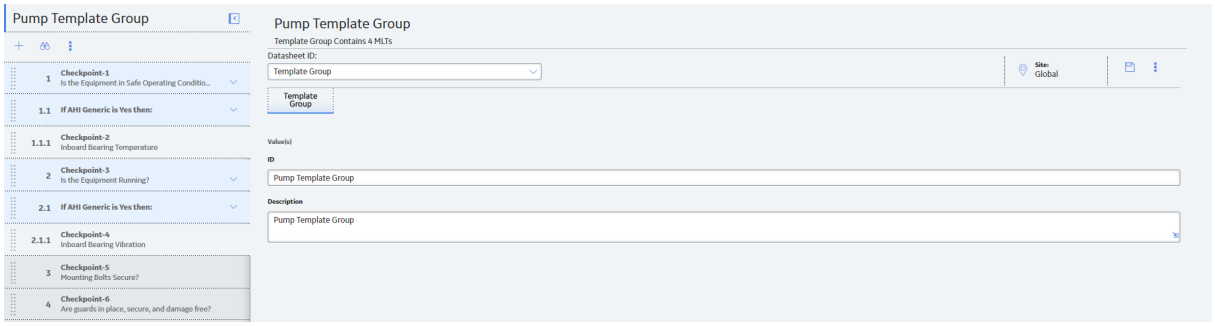
Field Caption	Field ID	Data Type (Length)	Comments
Reading Value Character	MI_READING0_RDG_VAL_CHAR_C	Character (50)	For Measurement Locations, must use one of the Allowable Values in the Category specified for the related Measurement Location. For Lubrication Requirements, must use a code in the system code table LR_CHAR_POSS_VALS (Possible values for Character type LRs). This field is disabled if the ML Type of the related Measurement Location is *Numeric*. It is always enabled for Lubrication Requirements.
Reading Value Numeric	MI_READING0_RDG_VAL_NUM_N	Numeric	For Measurement Locations, *if* a Category is specified for the related Measurement Location, must use one of the Allowable Values. This field is disabled if the ML Type of the related Measurement Location is *Character* or if the LR Type of the related Lubrication Requirement is *Check Off*.
Taken by	MI_READING0_RDG_TAKEN_BY_C	Character (50)	Must match an existing GE Digital APM User ID.
Reading Taken Date	MI_READING0_RDG_TAKEN_DT_D	Date	UTC time formatted as yyyy-mm-dd hh:mm:ss. Readings for the same Measurement Location or Lubrication Requirement should be ordered earliest first.

Example Rounds Templates Data Loader Workbook with Checkpoint Conditions

This topic provides samples of the worksheets in the Rounds Templates data loader workbook to illustrate the process of creating a Template Group containing Checkpoint Conditions using the Rounds Templates data loader workbook.

Overview

When imported into GE Digital APM, this example workbook creates a Template Group with six checkpoints and two Checkpoint Conditions, as shown in the following image:



This topic assumes that you are familiar with the basic process of creating Templates in a data loader and you are familiar with the fields used in these worksheets. For more information on the fields displayed in the following examples, see the Rounds Templates Data Loader Workbook section of the Workbook Layout and Use topic for Rounds Data Loaders.

Example: Sample Template Group Worksheet

The Template Group worksheet defines the values for the Template Group Batch ID, the Template Group ID, the Template Group Description, and the Site Reference Name.

Template Group Batch ID	ID	Description	Site Reference Name
ROUNDS_MLTG_ID	MI_DTACLTMP_ID_C	MI_DTACLTMP_DESCR_C	MI_SITE_NAME
Pump Template B1	Pump Template Group	Pump Template Group	*Global*

The value specified in the ID field determines the name of the Template Group as it will appear in Rounds Designer after the data load process is complete. For example, note that the ID specified in the ID field above appears as the title in the image of the Template Group in Rounds Designer above.

Example: Sample Measurement Location Template Worksheet

The Measurement Location Template worksheet defines values for each Measurement Location in the Template Group.

Template Group Batch ID	Template Item ID	Site Reference Name	Template ID	ML Type	Description
ROUNDS_MLTG_ID	ROUNDS_MLT_ID	MI_SITE_NAME	MI_ML_TMPLT_TEMPL_ID_C	MI_ML_TMPLT_MEAS_LOC_TYPE_C	MI_ML_TMPLT_DESC_C
Pump Template B1	MLT1	*Global*	Checkpoint-1	Character	Is the Equipment in Safe Operating Condition?
Pump Template B1	MLT2	*Global*	Checkpoint-2	Numeric	Inboard Bearing Temperature
Pump Template B1	MLT3	*Global*	Checkpoint-3	Character	Is the Equipment Running?
Pump Template B1	MLT4	*Global*	Checkpoint-4	Numeric	Inboard Bearing Vibration
Pump Template B1	MLT5	*Global*	Checkpoint-5	Character	Mounting Bolts Secure?
Pump Template B1	MLT6	*Global*	Checkpoint-6	Character	Are guards in place, secure, and damage free?

The values in the Template ID and Description fields appear as the names and descriptions, respectively, of the checkpoint in the Template Group in Rounds Designer. For example, note that the values in the Template ID and Description fields in the worksheet appear in the image of the Template Group at the beginning of this topic as the names and descriptions of the checkpoints.

In addition to the fields displayed in this image, the checkpoints with an ML Type value of Character in this example also have the following values defined in the Allowable Values field: Yes and No.

Example: Sample Checkpoint Template Sequence Worksheet

The Checkpoint Template Sequence worksheet specifies the sequence for the checkpoints in the Template Group. This sequence is determined by the value entered in the Group ID/Predecessor CPC ID field, as shown in the following image:

Template Group Batch ID	CTS ID	Group ID/Predecessor CPC ID	Template ID	Sequence	Template Group ID
ROUNDS_MLTG_ID	CTS_ID	MI_HSCPTMP_PRED_ENTY_KEY_N	MI_HSCPTMP_SUCC_ENTY_KEY_N	MI_HSCPTMP_SEQ_N	MI_HSCPTMP_REL_TMPG_KEY_N
Pump Template B1	CTS-1	Pump Template Group	Checkpoint-1	0	Pump Template Group
Pump Template B1	CTS-2	CPC-1	Checkpoint-2	0	Pump Template Group
Pump Template B1	CTS-3	Pump Template Group	Checkpoint-3	0	Pump Template Group
Pump Template B1	CTS-4	CPC-2	Checkpoint-4	0	Pump Template Group
Pump Template B1	CTS-5	Pump Template Group	Checkpoint-5	0	Pump Template Group
Pump Template B1	CTS-6	Pump Template Group	Checkpoint-6	0	Pump Template Group

In the Group ID/Predecessor CPC ID field, you can specify whether the checkpoint is a successor of a condition:

- If you do not enter a value, or if you enter the Group ID field value specified in the Template Group worksheet, the checkpoint sequence is determined by the location of each checkpoint entry in the worksheet. For example, in the image of the Template Group at the beginning of this topic, note that a 1 appears next to Checkpoint-1 and a 2 appears next to Checkpoint-3. Neither of these has a Checkpoint Condition specified in the Group ID/Predecessor CPC ID field in the Checkpoint Template Sequence worksheet.
- If you enter a CPC ID value in the Group ID/Predecessor CPC ID field, the checkpoint is a successor of a Checkpoint Condition. For example, in the image of the Template Group at the beginning of this topic, note that a value of 1.1.1 appears next to Checkpoint-2. This indicates that Checkpoint-2 is a successor of a Checkpoint Condition that is a successor of Checkpoint-1. Note also that, in the Checkpoint Template Sequence worksheet, Checkpoint-2 has a value of CPC-1 in the Group ID/Predecessor CPC ID field. This value specifies a Checkpoint Condition ID (CPC ID) that is defined in the following worksheet.

Example: Sample Checkpoint Condition Worksheet

The Checkpoint Condition worksheet defines the sequence for Checkpoint Conditions as well as the conditions under which the successor checkpoints of the Checkpoint Condition are displayed in Rounds Data Collection.

Template Group Batch ID	CPC ID	Predecessor CTS ID	Sequence Number	Template Group ID	Field Name	Field Value for Character Type	Possible Condition	Type
ROUNDS_MLTG_ID	CPC_ID	MI_CHKPCOND_PRED_KEY_N	MI_CHKPCOND_SEQ_NUM_N	MI_CHKPCOND_REL_TMPG_KEY_N	MI_CHKPCOND_FLD_NAM_C	MI_CHKPCOND_FLD_VAL_CHAR_C	MI_CHKPCOND_POSS_COND_C	MI_CHKPCOND_TYPE_C
Pump Template B1	CPC-1	CTS-1	0	Pump Template Group	AHI Generic	Yes	is	Character
Pump Template B1	CPC-2	CTS-3	0	Pump Template Group	AHI Generic	Yes	is	Character

The value in the CPC ID field is used in the Checkpoint Template Sequence worksheet in the Group ID/Predecessor CPC ID field to specify a predecessor Checkpoint Condition for a checkpoint. As mentioned in the previous section, notice that Checkpoint-2 and Checkpoint-4 in the Checkpoint Template Sequence worksheet both have CPC ID values in their Group ID/Predecessor CPC ID fields.

The value in the Predecessor CTS ID field determines which checkpoint is the predecessor of the Checkpoint Condition. For example, notice that CPC-1 has a value of CTS-1 in the Predecessor CTS ID field, which references the CTS ID defined for Checkpoint-1 in the Checkpoint Template Sequence worksheet.

No value is required in the Sequence Number field. However, if you enter a value in this field for Checkpoint Conditions with the same predecessor checkpoint (that is, sibling Checkpoint Conditions), the value you enter in this field will determine the sequence of the sibling Checkpoint Conditions.

The values you enter in the Possible Condition and Field Value for Character/Numeric Type fields determine the conditions under which the successor checkpoints will appear in Rounds Data Collection. In this example, the successor checkpoint of CPC-1 (that is, Checkpoint-2 as defined in the Checkpoint Template Sequence worksheet) will only appear when the reading value for the predecessor checkpoint (Checkpoint-1) is Yes.

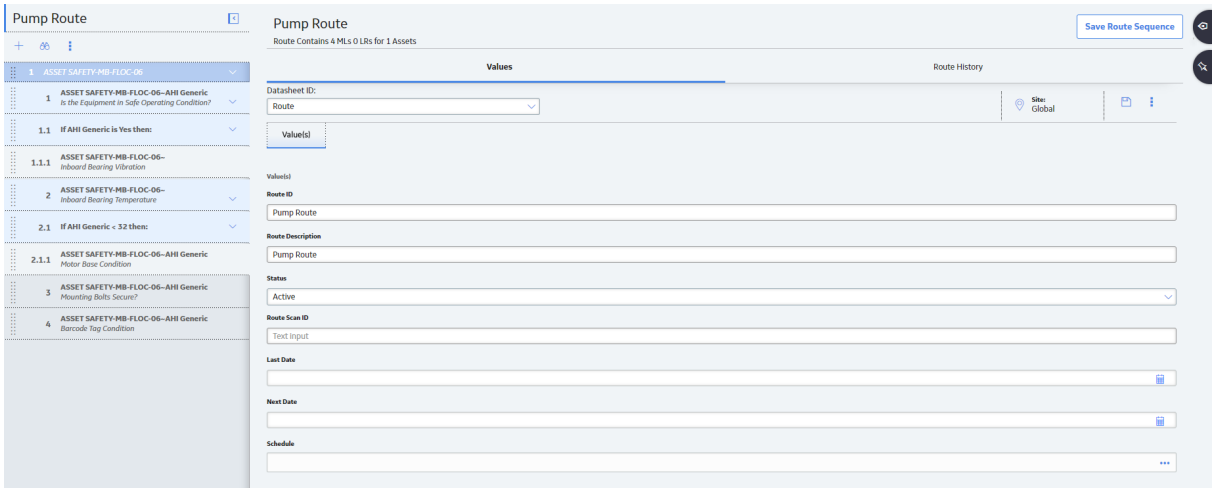
Note: When a predecessor checkpoint has a Type value of Character, the only valid value to enter in the Possible Condition field is `is`.

Example Rounds Route Data Loader Workbook with Checkpoint Conditions

This topic provides samples of the worksheets in the Rounds Route data loader workbook to illustrate the process of creating a Route containing Checkpoint Conditions using the Rounds Route data loader workbook.

Overview

When imported into GE Digital APM, this example workbook creates a Route with six checkpoints and two Checkpoint Conditions, as shown in the following image:



This topic assumes that you are familiar with the basic process of creating Routes in a data loader and you are familiar with the fields used in these worksheets. For more information on the fields displayed in the following examples, and for more information on the worksheets contained in the Rounds Route workbook, see the Rounds Route Data Loader Workbook section of the Workbook Layout and Use topic for Rounds Data Loaders. This topic also does not contain information on the Security User worksheet or the Checkpoint Task worksheet.

Example: Sample Route Worksheet

The Route worksheet specifies IDs used during the data load process as well as Route records used in GE Digital APM.

Route Batch ID	Route ID	Site Reference Name	Route Description	Status
ROUNDS_ROUTE_ID	MI_ROUTE000_ROUTE_ID_C	MI_SITE_NAME	MI_ROUTE000_ROUTE_DE	MI_ROUTE000_STAT_C
Pump Route B1	Pump Route	*Global*	Pump Route	Active

The value that you specify in the Route ID field determines the name of the Route as it appears in GE Digital APM. For example, note that the ID in this sample worksheet matches the name of the Route in the image at the beginning of this topic.

Example: Sample Measurement Location Worksheet

The Measurement Location worksheet defines values for each checkpoint on the Route.

Route Batch ID	ML Identifier	Checkpoint ID	Parent Condition Batch ID	Parent Condition Identifier	ML Type	LR Type	Is LR?	Description
ROUNDS_ROUTE_ID	ROUNDS_ML_ID	MI_CHECK_PT_CHEC_ID_C	MI_CHKPCOND_BATCH_ID	MI_CHKPCOND_ID_C	MI_MEAS_LOC_MEAS_LOC_TYPE_C	MI_LUBR_REQ_LR_TYPE_C	ROUNDS_CHECK_PT_IS_LR	MI_MEAS_LOC_DESC_C
Pump Route B1	1	Checkpoint-11			Character		FALSE	Is the Equipment in Safe Operating Condition?
Pump Route B1	2	Checkpoint-12	Condition B1	Condition-1	Numeric		FALSE	Inboard Bearing Vibration
Pump Route B1	3	Checkpoint-13			Numeric		FALSE	Inboard Bearing Temperature
Pump Route B1	4	Checkpoint-14	Condition B1	Condition-2	Character		FALSE	Motor Base Condition
Pump Route B1	5	Checkpoint-15			Character		FALSE	Mounting Bolts Secure?
Pump Route B1	6	Checkpoint-16			Character		FALSE	Barcode Tag Condition

For Routes with Checkpoint Conditions, to ensure that the Route sequence is loaded as expected, the values for the following fields in the Measurement Location worksheet and the Checkpoint Condition worksheet must match one another:

Measurement Location Worksheet Fields	Checkpoint Condition Worksheet Fields
ML Identifier (ROUNDS_ML_ID)	Parent ML Batch ID (PARENT_ROUNDS_ML_ID)
Checkpoint ID (MI_CHECK_PT_CHEC_ID_C)	Parent ML ID (MI_CHECK_PT_PR_CHEC_ID_C)
Parent Condition Batch ID (MI_CHKPCOND_BATCH_ID)	Condition Batch ID (MI_CHKPCOND_BATCH_ID_C)
Parent Condition Identifier (MI_CHKPCOND_ID_C)	Condition Identifier (MI_CHKPCOND_ID_C)

For example, note that the value in the ML Identifier and Checkpoint ID fields in the sample Measurement Location worksheet image above match the values in the Parent ML Batch ID and Parent ML ID fields, respectively, in the sample Checkpoint Condition worksheet image below.

Example: Sample Checkpoint Condition Worksheet

The Checkpoint Condition worksheet defines the conditions under which the successor checkpoints for Checkpoint Conditions are displayed in Rounds Data Collection. This worksheet also works together with the Measurement Location worksheet to determine the Route sequence for Routes with Checkpoint Conditions.

Route Batch ID	Condition Batcl	Condition Iden	Parent ML Batch ID	Parent ML ID	Field Name	Field Value for Character Type	Field Value for Numeric Type	Possible Condition	Type	Sequence
ROUNDS_ROUTE_ID	MI_CHKPCOND	MI_CHKPCOND	PARENT_ROUNDS_ML_ID	MI_CHECK_PT_PR_CHEC_ID_C	MI_CHKPCOND_FLD_NAM_C	MI_CHKPCOND_FLD_VAL_CHAR_C	MI_CHKPCOND_FLD_VAL_NUM_N	MI_CHKPCOND_POSS_COND_C	MI_CHKPCOND_TYPE_C	MI_CHKPCOND_SEQ_NUM_N
Pump Route B1	Condition B1	Condition-1	1	Checkpoint-11	AHI Generic	Yes		is	Character	
Pump Route B1	Condition B1	Condition-2	3	Checkpoint-13	AHI Generic		32	<	Numeric	

As mentioned above, the values defined in the Condition Batch ID and the Condition Identifier are used in the Measurement Location worksheet to specify successor checkpoints for Checkpoint Conditions. Also, the values specified in the Parent ML Batch ID and the Parent ML ID fields must match the values defined in the ML Identifier and

Checkpoint ID fields, respectively, for the predecessor checkpoint of a Checkpoint Condition.

No value is required in the Sequence field. However, if a value is entered in this field for Checkpoint Conditions with the same predecessor checkpoint (that is, sibling Checkpoint Conditions), the value you enter in this field determines the sequence of the sibling Checkpoint Conditions.

The values you enter in the Possible Condition and Field Value for Character/Numeric Type fields determine the conditions under which the successor checkpoints will appear in Rounds Data Collection. In this sample worksheet, the successor checkpoint of Condition-2 (that is, Checkpoint-14 as defined in the Measurement Location worksheet) will only appear when the reading value for the predecessor checkpoint (Checkpoint-13) is less than 32.

Note: When a predecessor checkpoint has a Type value of Character, the only valid value to enter in the Possible Condition field is `is`.

About the Rounds Data Loaders Load Verification

Prerequisites

After each worksheet is loaded:

1. Review the data loader log to identify any errors or warnings.
2. Update the data loader workbook to correct any errors, and then re-import.
3. Repeat until the import of each record is error free.

Steps

Note: It is recommended that a query is executed in GE Digital APM on the relevant family to ensure that records have been created and populated as expected. Imported records should also be spot checked in Record Manager or Rounds Designer to verify that the expected relationships have been created and site references have been set.

1. Log in to GE Digital APM as a Rounds Administrator user.
2. On the left navigation menu, select **Health**, and then select **Rounds Designer**.

   The **Rounds Designer Overview** page appears.
3. Select the **Allowable Values** tab.

   The **Allowable Values** section appears, displaying a list of Allowable Values categories. The Allowable Values categories are groups of Allowable Values records that have the same value in the Category field.
4. Select an Allowable Value category.
5. Verify that the data appears as expected, and that the values can be edited or new values added to the Category.
6. Verify that you can create new character (and numeric, if applicable) ML Templates and MLs, using Categories from the imported Allowable Values data.
7. Verify that the Allowable Values appear as expected.
8. Select the **ML Templates** tab.
9. Verify that the loaded ML Templates appear as expected.
10. Select an **ML Template** to open in Record Manager.
11. Verify that the record contains the expected values and can be edited.
12. Select an **ML Template**.
13. Verify that **Update Existing MLs** feature returns the expected related MLs.

14. Select the **ML Template Groups** tab.
15. Verify that the loaded Template Groups appear as expected.
16. Select an **ML Template Group**.
17. Verify that Templates and Conditions can be added, and that the drag-and-drop items to reorder works as expected.
18. Select the **Routes** tab.
19. Verify that the loaded Routes appear as expected.
20. If the Users are assigned to the Routes via the data loader, select the **Routes** tab, select a Route, and verify that it has been assigned to a User.
21. Select a Route to open in Route Management and:
    a. Verify the New and existing MLs, MLs from Templates, and if Conditions can be added.
    b. Verify that the Routes can be re-ordered.
    c. Verify that the MLs are linked to Assets.
    d. Verify that the Asset information is populated.
    e. Verify that the Schedules have been populated.
    f. Verify that the Readings have been linked to MLs.
22. Select the **Routes** tab, select a Route, and verify that it can be assigned to a User.

    Ensure that the Route and/or MLs it contains are due.
23. Log out of GE Digital APM.
24. Log in to GE Digital APM as Mobile Data Collection user.
25. On the left navigation menu, select **Health**, and then select **Rounds Data Collection**.

    The **Rounds Data Collection** page appears.
    a. For complete test coverage, this should be done on an applicable mobile device.
26. Verify that the assigned Route appears on the **Rounds Data Collection Overview** page.
27. Verify that the Route can be set for offline use.
28. Select the Route from the Due or Overdue list and perform an inspection:

a. Enter Readings for some of the checkpoints, verifying that the Reading field contains the expected Allowable Values, if applicable

b. Verify that the alerts are triggered, that alert messages are displayed, and that the actions can be selected as expected.

c. Add a Recommendation for an ML.

d. Close the tab.

e. Mark the Route done.

29. Log out of GE Digital APM.
30. Log in toGE Digital APM as Rounds Administrator user.
31. On the left navigation menu, select **Health**, and then select **Rounds Designer**.

    The **Rounds Designer Overview** page appears.
32. Select the **Routes** tab.
33. Select the Route for which the inspection was just completed.
34. Verify that the Route History appears correctly. Check that the correct number of readings are reported.
35. Verify that the Readings that were taken appear against the relevant MLs.
36. Verify that the Recommendation that was created appears against the relevant ML.

If you set up the Asset Health Indicator service to run during the data load, you should also verify that health indicators have been created as expected:

1. Access a Measurement Location that was imported in Record Manager, and verify that a Health Indicator record is linked to the Measurement Location.
2. Alternatively, access the asset related to the Measurement Location in Asset Health Manager to view the health indicators that exist for the asset.

    a. On the left navigation menu, select **Admin**, and then select **Application Settings**.

    The **Application Settings** page appears.

    b. Select **AHM**.

    c. In the left pane, select the **Health Indicator Source Management** tab, and then use the filter and search options to find the Measurement Locations to which you want to add health indicators.

    d. Verify that a green check mark is displayed for the Measurement Locations for which related Health Indicator records do not exist.

    e. To create Health Indicator records for Measurement Locations beside which

the green check mark appears, but for which there are no records:

i. Select the check boxes next to the affected Measurement Locations, and then select **Exclude**.

   A red X appears.

ii. Select **Include**.

   Health Indicators will now be created.

3. If health indicators have not been created as expected, you can manually create health indicators by performing the following steps::

   a. On the left navigation menu, select **Admin**, and then select **Application Settings**.

      The **Application Settings** page appears.

   b. Select **AHM**.

   c. In the left pane, select the **Health Indicator Source Management** tab, and then use the filter and search options to find the Measurement Locations to which you want to add health indicators.

   d. Verify that a green check mark is displayed against the Measurement Locations for which related Health Indicator records do not exist.

   e. To create health indicator records for Measurement Locations beside which the green check mark appears but there is no record:

      i. Select the check boxes next to the affected Measurement Locations, and then select **Exclude**.

         A red X appears.

      ii. Select **Include**.

         Health Indicators will now be created.

About the APM Mechanical Integrity Data Loaders

This topic provides a listing of all the APM Mechanical Integrity Data Loaders.

About the Inspection Management (IM) Data Loaders

The following Data Loaders are available in Inspection Management:

- Inspection Management (IM) Assets Data Loader
- Inspection Management (IM) Functional Location Data Loader

Throughout the documentation, these Data Loaders are collectively called the Inspection Management (IM) Data Loaders. You can use them to implement Inspection Management when you have inspection data in a legacy system. To import data using these Data Loaders, GE Digital APM provides the following Excel templates:

- **Inspection Management (IM) Assets.xlsx:** Using this Data Loader, you can create or update Inspections and related records that are linked to Equipment records.
- **Inspection Management (IM) Functional Location.xlsx:** Using this Data Loader, you can create or update Inspections and related records that are linked to Functional Location records.

The data from the templates will be imported into GE Digital APM using the corresponding Data Loaders.

Note: The Excel templates are referred to throughout this documentation as the *data loader workbooks*.

You can use the data loader workbooks to create or update records in the following Inspection families:

- Inspection Confidence Evaluation
- Inspection Profile
- Inspection Method
- Inspection Task
- Inspection (i.e., Bundle Inspection, Full Inspection, General Inspection, Pressure Test Inspection, and all types of Checklists)
- General Finding
- Bundle Sub-Inspection
- Pressure Test Sub-Inspection
- Inspection Recommendation
- Reference Document

Using the data loader workbooks, you can also create:

- Records that represent *archived* Inspections (i.e., inspections that have been completed and approved in the past). Since archived Inspections will be locked after

creation, they cannot be updated using the data loader workbooks.

- Records of a custom sub inspection family that you may have created.

The data on the (Picklist) worksheet is not loaded when you load data.

Note: A data load for Inspection Management is intended to be completed by an individual in your organization who has been designated as being responsible for importing and maintaining Inspections in GE Digital APM, usually an Inspector.

About the Inspection Management (IM) Data Loaders Requirements

This documentation assumes that your organization has fully completed the deployment of the Inspection Management module. The Inspection Management (IM) Data Loaders should only be used after the Inspection Management module has been implemented, and you have defined Site References, Functional Locations, and assets (Equipment records) for your organization.

Human Resources and Resource Roles

The Inspection Management (IM) Data Loaders expect that individuals in your organization who will be performing and reviewing Inspections have one or more of the following Resource Role records linked to their Human Resource records:

- Inspection Supervisor
- Inspector

Certain privileges are required to complete a data load based on to whether inspections are (*Active* or *Archived* and the Status of the inspection *Draft, Pending Approval*, or *Approved*). Persons belonging to either the MI Inspection or the Data Loader User Security Group must:

... have the following Resource Role(s):	...with inspections that are:	...and inspections in the following Status:	Notes
None	Active	Draft	None
Inspector	Active	Pending Approval	None
Inspector and Inspection Supervisor	Archived	Approved	The Inspection Lock and the Final Inspection Lock are set to *true.*

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI Inspection Security Group, or a Security Role that is associated with this Security Group.

About the Inspection Management (IM) Data Loaders Inspection Types

The Inspection Management (IM) Data Loaders can be used to load two different types of Inspections:

- **Active Inspections:** Inspections that are still in the process of being completed or reviewed. After you load data, you can use the Inspection Management Bulk Approval feature to approve active inspections.
- **Archived Inspections:** Inspections that have been reviewed, locked, and archived. Because of the nature of approving archived inspections, it is best for one person to perform this function. In the data loader workbooks, archived Inspections as those that have both the Inspection Lock and Final Inspection Lock fields set to *True*, and the Inspection Document Status field set to *Approved*. When an archived Inspection is loaded, the Inspection Report Owner and Reviewer's Name fields will be set to the name of the user performing the data load.

About the Inspection Management (IM) Data Loaders Data Model

This content has been intentionally excluded from the GE Digital APM product documentation website. This content is available to you via the product documentation that is provided within the GE Digital APM system.

About the Inspection Management (IM) Data Loaders General Loading Strategy

Prerequisites

- For Oracle databases, valid cell values are *case-sensitive*.
- The data loader workbook contains sample data in each column. It is only for your reference. You must remove this data before using the data loader workbook.

Best Practices

When importing data using the Inspection Management (IM) Data Loaders, you must use the following best practices:

- ID fields (the second row on each worksheet) must not include special characters or spaces.
- Columns (including columns representing custom fields) on the worksheets should be formatted as Text.
- When loading archived Inspections, you do not need to set values for the Inspection Report Owner and Reviewer's Name cells. These fields will be set automatically to the name of the user who loads the data.
- The supported date formats, time zone, and units of measure will be based on the user's settings.
- When creating ID numbers for loading inspection data, choose unique values.
- The value in the Inspection Reference field must be unique.

Load Sequence

The Inspection Management data load is performed in a specific sequence in order to create all necessary relationships between records:

1. The first step of the load sequence differs based on whether you are using the Inspection Management (IM) *Assets* Data Loader or the Inspection Management (IM) *Functional Location* Data Loader.

   If using the Inspection Management (IM) Assets Data Loader, the Assets worksheet is processed. An existing asset will be looked up based on values in the Equipment ID (MI_EQUIP000_EQUIP_ID_C), CMMS System (MI_EQUIP000_SAP_SYSTEM_C), and, if provided, Equipment Technical Number (MI_EQUIP000_EQUIP_TECH_NBR_C) cells.

   If using the Inspection Management (IM) Functional Location Data Loader, the Functional_Location worksheet is processed. An existing Functional Location will

be looked up based on values in the Functional Location ID (MI_FNCLOC00_FNC_LOC_C) and CMMS System (MI_FNCLOC00_SAP_SYSTEM_C) cells.

If an Asset or Functional Location specified on the respective worksheets does not exist, it will be skipped, along with all entries in the subsequent worksheets corresponding to that Asset or Functional Location.

2. The Inspection_Profile worksheet is processed. For each row based on the cells specified in step 1, an Inspection Profile is looked up. If the Asset or Functional Location does not have a corresponding Inspection Profile, a new record will be created and linked.
3. The Inspection_Method worksheet is processed. The assets or Functional Locations from step 1 and the Inspection Profiles from step 2 are considered, in addition to the following columns on the worksheet: Item Category (MI_PROFINSP_ITEM_CAT_C), Item ID (MI_PROFINSP_ITEM_ID_C), Method Category (MI_INSPMETH_ITEM_CAT_C), Method ID (MI_INSPMETH_ITEM_ID_C), and (only for assets) RBI Degradation Mechanism (MI_INSPMETH_DAMAGE_MECH_C).
4. If a corresponding Inspection Method is not found, a new Inspection Method record will be created. Otherwise, the record will be updated The Inspection_Task worksheet is processed. The assets or Functional Locations from step 1 are considered as well as the following columns on the worksheet: Task ID (MI_TASK_ID), Reoccurring (MI_TASK_REOCC_FLG), and Override Interval (MI_TASK_OVERRIDE_INTER_F).

   If the Reoccurring cell is set to *True*, the Next Date cell cannot be specified because the task is reoccurring. As a result, the Next Date value will be automatically calculated.

   If the Override Interval cell is set to *False*, the setting of the Desired Interval cell by the data loader will not occur. The Desired Interval will be retrieved from the Time-Based Inspection (TBI) Settings to create reoccurring tasks. If a corresponding TBI Setting is not found, the Desired Interval will be set to 0. Therefore, the Override Interval cell cannot be set to False because tasks that do not reoccur do not have TBI settings.

   If the Override Interval cell is set to *False*, but the value in the Desired Interval cell is less than the value in the Minimum Interval cell, the Desired Interval will be set to the value of Minimum Interval.

   If the Reoccurring cell of the task is set to *False*, the Last Date and the Desired Interval cells cannot be specified. For tasks that are not set to reoccur, the following cells will not be copied from the data loader spreadsheet and they will have the following default settings:

   - The Last Date cell will be empty.
   - The Desired Interval cell will be set to *0*.

If logical cells (i.e. Override Interval, Reoccurring) do not have values, they will be set to *True* by default.

5. The Inspections worksheet is processed. For each row based on the cells specified in step 1, as well as the Inspection Reference (MI_EVENT_ID) column, an Inspection. If no corresponding Inspection record is found, then a new record is created. Otherwise, the record will be updated.

   If the Inspection Document Status (MI_INSP_001_STATUS_INSP_C) cell is set to *Approved* and the Final Inspection Lock (MI_INSP_001_LOCK_FINAL_L) cell is set to *True*, the record will be considered an Archived Inspection. The Reviewer and Inspection Owner fields are automatically set to the user performing the data load.

   If the Inspection Task Complete field has been added as a column to the worksheet, and if values have been provided, an error message will be added to the log, and data in the columns will be skipped.

   If an existing Inspection is being updated via the data load, but the Inspection Lock field for the record is set to True, and:

   - ...you are not the user designated in the Inspection Report Owner field, an error message will be added to the log and the Inspection will not be updated.

     -or-

   - ...you are the user designated in the Inspection Report Owner field, but the data being loaded via the Excel workbook does not set the corresponding Inspection Lock cell to False, an error message will be added to the log and the Inspection will not be updated.

6. The General_Finding worksheet is processed. Based on the fields in steps 1 and 5, and the Inspection Profile and Method, a General Finding record will be looked up. If the record is not found, then a new record is created. Otherwise, the record will be updated.

7. The Inspection_Recommendation worksheet is processed. Based on the fields in steps 1 and 5, and the Recommendation ID (MI_REC_ID) column, an Inspection Recommendation is looked up. If a corresponding Inspection Recommendation is not found, then a new record is created. Otherwise, the record will be updated.

   If the Inspection Recommendation record is associated with an Archived Inspection, then the Author Name and Reviewer Name fields for the Inspection Recommendation record will be set to the user performing the data load.

8. The Reference_Document worksheet is processed. Based on the field in step 5, and the Reference Document ID (CTIT_ID) column, a Reference Document is looked up. If a corresponding Reference Document is not found, then a new record is created. Otherwise, the record will be updated.

9. The Bundle_Sub_Inspection, the Pres_Test_Sub_Inspection, and the Inspection_

Confidence Worksheets are processed. Based on the field in step 5, and the Inspection Reference (MI_EVENT_SUB_INSP_ID) column, the related inspection is looked up. If a corresponding related sub-inspection record is not found, a new record will be created.

Currently, the sub-inspection families that are supported by the Inspection Management (IM) Data Loaders are the Bundle Sub-Inspection and Pressure Test Sub-Inspection families.

For the Bundle Sub-Inspection family, there are several combinations of column values which you cannot load and the combination of these column values will result in an error:

- An error will be issued in the log if the value of the Action This Inspection column is set to NO ACTION and any of the following columns have a value:
    - Tubes Plugged During This Inspection
    - Tubes (Plugged At Start) Replaced
    - Tubes (Not Previously Plugged) Replaced
- An error will be issued in the log if the value in the Action This Inspection cell is set to TUBES PLUGGED, TOTAL RETUBE, or BUNDLE REPLACED and any of the following columns are set to:
    - Tubes (Plugged At Start) Replaced
    - Tubes (Not Previously Plugged) Replaced
        - The column header for the sub-inspection Reference value will be different for each sub-inspection family, but will be similar to <Sub-Inspection Family Name> Reference.
        - The value in the sub-inspection reference column will be stored in the Inspection Reference column of each created Sub-Inspection record. That column will be used for lookup when performing further loads.
        - The sub-inspection will be updated with the data given from the Inspection Management (IM) Data Loaders Template.
- Since a relationship definition does not exist between the Bundle Sub-Inspection family and the General Inspection family, an error will be issued.

    Note: If the relationship definition is added between the Bundle Sub-Inspection family and the General Inspection family, the Bundle Sub Inspection family will load.

About the Inspection Management (IM) Data Loaders Workbook Layout and Use

To import data using the Inspection Management (IM) Data Loaders, GE Digital APM provides the following Excel workbooks:

- **Inspection Management (IM) Assets.xlsx** (for Inspections related to Equipment records)
- **Inspection Management (IM) Functional Location.xlsx** (for Inspections related to Functional Location records)

You must use these workbooks to load the data. You can modify the Excel workbooks to include custom fields used by your organization. Generally, your organization will use one of the two workbooks, but not both.

Note: The Excel workbooks are referred to throughout this documentation as the *data loader workbooks.*

The following table provides a list of worksheets that are included in the data loader workbooks. Unless otherwise specified, the worksheets appear in both the workbooks.

Worksheet	Description
Assets	This worksheet is used to specify existing Equipment records to which Inspections and related records will be linked. This worksheet appears only in the Inspection Management (IM) Assets Data Loader workbook.
Functional_Location	This worksheet is used to specify existing Functional Location records to which Inspections and related records will be linked. This worksheet appears only in the Inspection Management (IM) Functional Location Data Loader workbook.
Inspection_Profile	This worksheet is used to specify Inspection Profile records that you want to create or update.
Inspection_Method	This worksheet is used to specify Inspection Method records that you want to create or update.
Inspection_Task	This worksheet is used to specify Inspection Task records that you want to create or update.

Worksheet	Description
Inspections	This worksheet is used to specify the following records: • Bundle Inspection • Full Inspection • General Inspection • Pressure Test Inspection • All types of Checklists
Inspection_Confidence_Eval	This worksheet is used to specify Inspection Confidence Evaluation records that you want to create or update.
Bundle_Sub_Inspection	This worksheet is used to specify Bundle Sub-Inspection records that you want to create or update.
Press_Test_Sub_Inspection	This worksheet is used to specify Pressure Test Sub-Inspection records that you want to create or update.
General_Finding	This worksheet is used to specify General Finding records that you want to create or update.
Custom_Sub_Inspection	If you have created a custom sub inspection family, this worksheet is used to specify the custom sub inspection records that you want to create or update.
Inspection_Recommendation	This worksheet is used to specify Inspection Recommendation records that you want to create or update.
Reference_Document	This worksheet is used to specify Reference Document records that you want to create or update.
(Picklist)	This worksheet contains a list of valid values that you can enter in each column (as applicable) in the aforementioned worksheets. When you load data using the data loader, the data on this worksheet is *not* loaded.

Color Coding

Certain columns on the worksheets have different functions and requirements. To illustrate this, certain columns are color-coded. The following table lists the colors and what they represent.

Color	Description	Comments
	Required Key Fields	Indicates columns that contain values that are used by the Inspection Management (IM) Data Loaders to look up and create records. If these columns are removed from the worksheets, the data load will fail. While the *worksheets* require that these columns be present, *values* are not necessarily required in these columns.
	Fields Required for Saving Records	Indicates columns that contain values that are required to save the record.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for Inspection Management, should contain values.
	Custom Fields	Indicates columns in which you can specify custom fields.

Limitations

The Inspection Management (IM) Data Loaders have the following limitations:

- The values that you enter in the data loader workbooks are case-sensitive.
- When you use the data loader to update Inspection Management families:
  - If a cell contains data, the value in the corresponding field will be updated in the database.
  - If a cell is blank, the value in the corresponding field will *not be updated* with a blank value in the database. The value that previously existed in the field is retained.

> **Tip:** If you do not want to update a field value, you can remove the corresponding column from the data loader workbooks. You cannot, however, remove columns that correspond to required fields.

Assets Worksheet

On the Assets worksheet, you can specify assets to which you want to link Inspections and related records. The columns that appear on this worksheet also appear on every subsequent worksheet, and are used to identify the records that will be linked, directly or indirectly, to the assets. This worksheet only appears in the Inspection Management (IM) Assets Data Loader workbook.

> **Note:** Each row in this worksheet represents a *unique* asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	A value is required in at least one cell.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment record for an asset has a value in the CMMS System field, you must enter that value in this column.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	If the CMMS System column contains a value, and the Equipment record for the asset has a value in the Equipment Technical Number field, you must enter that value in this column. If the CMMS System column does not contain a value, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.

Functional_Location Worksheet

On the Functional_Location worksheet, you can specify Functional Location records to which you want to link Inspections and related records. The columns that appear on this worksheet also appear on every subsequent worksheet, and are used to identify the records that will be linked, directly or indirectly, to the Functional Locations. This worksheet appears only in the Inspection Management (IM) Functional Location Data Loader workbook.

Note: Each row in this worksheet represents a *unique* Functional Location. You should not include the same Functional Location more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	A value is required in at least one cell.
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	If the CMMS System field in the Functional Location record contains a value, you must enter that value in this column.

Inspection_Profile Worksheet

On the Inspection_Profile worksheet, you can specify Inspection Profile records that you want to create or update.

Note: Each row represents a *unique* record, though multiple records may be related to the *same* asset.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Item Category	MI_PROFINSP_ITEM_CAT_C	Character (50)	A value is required. The combination of values in the Item Category and Item ID columns must be unique per asset. This column must only contain System Code IDs from the MI_INSPECTION_PROFILE_CATEGORY System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Item ID	MI_PROFINSP_ITEM_ID_C	Character (255)	A value is required. The combination of values in the Item Category and Item ID columns must be unique per asset.
Item Description	MI_PROFINSP_ITEM_DESC_C	Text	None
RBI Component	MI_PROFINSP_COMPONENT_C	Character (250)	This column must only contain the Entity ID of an existing Criticality RBI Component record that is linked to the same asset or Functional Location as the Inspection Profile.

Field Caption	Field ID	Data Type (Length)	Comments
RBI Component Family	MI_PROFINSP_COMP_FAM_C	Character (100)	This column must only contain the Family name of the Criticality RBI Component specified in the RBI Component column (e.g., Criticality RBI Component - Piping). This column appears only in the Inspection Management (IM) Assets Data Loader workbook.
Sequence	MI_PROFINSP_SEQUENCE_N	Numeric	None

Inspection_Method Worksheet

On the Inspection_Method worksheet, you can specify Inspection Method records that you want to create or update.

Note: Each row represents a *unique* record, though multiple records may be related to the *same* Inspection Profile.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Item Category	MI_PROFINSP_ITEM_CAT_C	Character (50)	Values in this column must match the values entered on the Inspection_Profile worksheet, if they exist. You can link multiple records to the same Inspection Profile.
Item ID	MI_PROFINSP_ITEM_ID_C	Character (255)	Values in this column must match the values entered on the Inspection_Profile worksheet, if they exist. You can link multiple records to the same Inspection Profile.
Method Category	MI_INSPMETH_ITEM_CAT_C	Character (100)	A value is required. The combination of values in the Method Category, Method ID, and RBI Degradation Mechanism columns must be unique per Inspection Profile. This column must only contain one of the System Code IDs from the MI_INSPECTION_METHOD_CATEGORY System Code Table. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Method ID	MI_INSPMETH_ITEM_ID_C	Character (255)	A value is required. The combination of values in the Method Category, Method ID, and RBI Degradation Mechanism columns must be unique per Inspection Profile.
RBI Degradation Mechanism	MI_INSPMETH_DAMAGE_MECH_C	Character (255)	A value is required. This column must only contain the Entity ID of a Potential Degradation Mechanism that is linked to the Criticality RBI Component specified in the corresponding RBI Component column on the Inspection_Profile worksheet. The combination of values in the Method Category, Method ID, and RBI Degradation Mechanism columns must be unique per Inspection Profile. ⚠**IMPORTANT:** This column appears only in the Inspection Management (IM) Assets Data Loader workbook, and should *not* be included in the Inspection Management (IM) Functional Location Data Loader workbook.
Description	MI_INSPMETH_ITEM_DESC_C	Character (1000)	None

Inspection_Task Worksheet

On the Inspection_Task worksheet, you can specify Inspection Task records that you want to create or update.

Note: Each row represents a *unique* record, though multiple records may be related to the *same* Inspection Profile.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Task ID	MI_TASK_ID	Numeric	A value is required and must be unique. This value identifies the Inspection Task.
Task Type	MI_TASK_TASK_TYPE_CHR	Character (255)	None
Task Description	MI_TASK_DESC_TX	Text	None

Field Caption	Field ID	Data Type (Length)	Comments
Task Details	MI_TASK_DETAILS_T	Text	None
Last Date	MI_TASK_LAST_DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Override Interval	MI_TASK_OVERRIDE_INTER_F	Boolean	Enter *True* or *False.*
Desired Interval	MI_TASK_DESIR_INTER_NBR	Numeric	None
Next Date	MI_TASK_NEXT_DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Next Date Basis	MI_TASK_NEXT_DATE_BASIS_C	Character (1000)	None
Coverage	MI_TASK_COVER_NBR	Numeric	None
Task Assigned To	MI_TASK_ASSGN_TO_C	Character (50)	None
Reoccurring	MI_TASK_REOCC_FLG	Boolean	Enter *True* or *False.* You can enter a value in this column only if you want to *create* an Inspection Task. If, however, you want to *modify* an Inspection Task using the data loader work-book, you *cannot* modify the value in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Unconstrain Min/Max Dates	MI_TASK_UNCONSTR_MN_MX_DT_FLG	Boolean	Enter *True* or *False.*
Min Interval	MI_TASK_MIN_INTER_NBR	Numeric	None
Max Interval	MI_TASK_MAX_INTER_NBR	Numeric	None
Inspection Document Type	MI_TASK_INSP_INSPTYPE_FMLYID_C	Character (50)	None

Inspections Worksheet

On the Inspections worksheet, you can specify the following types of Inspections that you want to create or update:

- Bundle Inspection
- All types of Checklists (e.g., API 510 External Checklist, ILI Checklist)
- Full Inspection
- General Inspection
- Pressure Test Inspection

Note: Each row represents a *unique* record, though multiple records may be related to the *same* asset or Functional Location.

⚠**IMPORTANT:** If you have created a custom Inspection, and if you want to create or update records of that family using the data loader workbooks, ensure that the custom inspection family is linked to the Equipment or Functional Location family using the Has Inspections relationship definition.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.

Field Caption	Field ID	Data Type (Length)	Comments
Inspection Reference	MI_EVENT_ID	Character (255)	A value is required. If the value in the Use System Generated ID column is *False* (or if the column is blank or removed), then the value in this column must be unique. If the value in the Use System Generated ID column is *True*, then, after you load data, the value in this column is *not* used to populate the Inspection Reference field in the Inspection. Instead, a system-generated value is used to populate the field. In this case, the value in this column is used only to identify the records that must be linked to the Inspection.

Field Caption	Field ID	Data Type (Length)	Comments
Use System Generated ID	MI_SYS_GEN_ID	Logical	Enter *True* or *False*. If you enter *False* (or if the column is blank or removed), after you load data, the value in the Inspection Reference column is used to populate the Inspection Reference field in the Inspection. The default value is False. If you enter *True*, after you load data, the value in the Inspection Reference field in the Inspection is populated with a system-generated value. In this case, even if you enter a value in the Inspection Reference column, it is not used to populate the field. If you want to use the data loader workbooks to *modify* an Inspection, you must enter *False* (or leave the column blank or remove it). If, however, the value in this column is *True*, then, after you load data, the Inspection is *not* modified. Instead, a *new* Inspection is created.

Field Caption	Field ID	Data Type (Length)	Comments
Family ID	FMLY_ID	Character (255)	Values in this column are used to identify the type of the Inspection record that you want to create or update. In addition to the values specified on the (Picklist) worksheet, if you want to enter the family ID of a custom inspection family that you created, ensure that the family is linked to the Equipment or Functional Location family using the Has Inspections relationship family.
Inspection Headline	MI_EVENT_SHRT_DSC_CHR	Character (255)	None
Commencement Date	MI_EVENT_STRT_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Completion Date	MI_EVENT_END_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Tasks Addressed	MI_EVENT_TASKKEYS_C	Character (1000)	Enter a list of Entity Keys or Task IDs of Inspection Tasks, separated by commas. You can enter up to 20 values in each cell.
Equipment Operating State	MI_INSP_001_STATE_EQUIP_OP_C	Character (50)	This column must only contain the System Code IDs from the MI_EQUIP_OP_STATE System Code Table. If the system code table has been customized, the valid values could be different. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Reason for Inspection	MI_INSP_001_REASON_C	Character (50)	Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Inspection Summary	MI_EVENT_LNG_DSC_TX	Text	None
Inspection Report Owner	MI_INSP_001_NAME_INSPECTOR_C	Character (255)	The value in this column must match an existing Security User who is assigned the Inspector Resource Role. Enter value in the following format: <Last Name>, <First Name> ~ <User ID>
Inspection Document Status	MI_INSP_001_STATUS_INSP_C	Character (50)	Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Inspection Lock	MI_INSP_001_LOCK_INSP_L	Boolean	Enter *True* or *False*. If the value in this column is *True*, and the Final Inspection Lock column is blank or *False*, the value in the Inspection Report Owner column must match the Security User who is loading the data.
Reviewers Name	MI_INSP_001_NAME_REVIEWER_C	Character (255)	The value in this column must match an existing Security User who is assigned the Inspection Supervisor Resource Role. Enter value in the following format: <Last Name>, <First Name> ~ <User ID>

Field Caption	Field ID	Data Type (Length)	Comments
Reviewers Comments	MI_INSP_001_COMMENTS_REVIEW_T	Text	None
Final Inspection Lock	MI_INSP_001_LOCK_FINAL_L	Boolean	Enter *True* or *False.* If the value in this column and the Inspection Lock column is *True*, the Inspection Report Owner and Reviewer's Name fields for the record will be populated with the name of the user who is loading the data.
Published	MI_INSP_001_PUBLISHED_L	Boolean	Enter *True* or *False.*

Inspection_Confidence_Eval Worksheet

On the Inspection_Confidence_Eval Worksheet, you can specify Inspection Confidence Evaluation records that you want to create or update.

Note: Each row represents a unique record, though multiple records may be related to the same Inspection Profile.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional Location worksheet. You can link multiple records to the same Functional Location.
CMMS System (only for Asset load)	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Inspection Reference	MI_EVENT_ID	Character (255)	Value in this column must match the value in the Inspection Reference column of the parent inspection specified on the Inspections worksheet.
Inspection Confidence ID	MI_EVENT_SUB_INSP_ID	Character (255)	Enter a unique value in the following format: <Inspection Reference>-<Sequence Number>
Degradation Mechanism	MI_INSP_001_DEG_MECH_C	Character (100)	This column must only contain the System Code IDs from the DEGRADATION_MECHANISM_TYPES System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Type of Inspection	MI_INSP_001_TYPE_C	Character (50)	Refer to the (Picklist) worksheet for a list of values that you can enter in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Extent	MI_INSP_001_EXTENT_C	Character (1000)	This column must only contain System Code IDs from the MI_MI_INSPECTION_EXTENT System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.

Bundle_Sub_Inspection Worksheet

On the Bundle_Sub_Inspection worksheet, you can specify Bundle Sub-Inspection records that you want to create or update.

Note: Each row represents a unique record, though multiple records may be related to the same Inspection Profile.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.

Field Caption	Field ID	Data Type (Length)	Comments
Inspection Reference	MI_EVENT_ID	Character (255)	Values in this column must match the Inspection Reference of the parent inspection specified on the Inspections worksheet.
Bundle Sub Inspection Reference	MI_EVENT_SUB_INSP_ID	Character (255)	Values in this column are used to uniquely identify the Bundle Sub-Inspection. This field does not appear on the datasheet; however, it is used to uniquely identify the Bundle Sub-Inspection.
Bundle Tag	MI_EVENT_ASST_ID_CHR	Character (255)	None
Bundle Type	MI_INSPBUND_BUNDLE_TYPE_C	Character (50)	Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Total Number of Tubes In Bundle	MI_INSPBUND_TUBES01_N	Numeric	None
Action This Inspection	MI_INSPBUND_ACTION_THIS_INSP_C	Character (50)	Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Tubes Plugged At Inspection Start	MI_INSPBUND_TUBES02_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Tubes Plugged During This Inspection	MI_INSPBUND_TUBES07_N	Numeric	This column is not applicable if the value in the Action This Inspection column is NO ACTION.
Tubes (Plugged At Start) Replaced	MI_INSPBUND_TUBES03_N	Numeric	This column is not applicable if the Action This Inspection column contains one of the following values: • NO ACTION • TUBES PLUGGED • TOTAL RETUBE • BUNDLE REPLACED
Tubes (Not Previously Plugged) Replaced	MI_INSPBUND_TUBES04_N	Numeric	This column is not applicable if the Action This Inspection column contains one of the following values: • NO ACTION • TUBES PLUGGED • TOTAL RETUBE • BUNDLE REPLACED
Bundle Inspection Summary	MI_EVENT_LNG_DSC_TX	Text	None

Press_Test_Sub_Inspection Worksheet

On the Press_Test_Sub_Inspection worksheet, you can specify Pressure Test Sub-Inspection records that you want to create or update.

Note: Each row represents a unique record, though multiple records may be related to the same parent Inspection Record.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Inspection Reference	MI_EVENT_ID	Character (255)	Values in this column must match the Inspection Reference of the parent inspection specified on the Inspections worksheet.
Pressure Test Inspection Reference	MI_EVENT_SUB_INSP_ID	Character (255)	Enter a unique value. Values in this column are used to identify the Pressure Test Sub-Inspection.
Test Media - Shell Side	MI_INSPPTST_MEDIA_TEST_SH_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Test Media - Tube Side	MI_INSPPTST_MEDIA_TEST_TB_C	Character (50)	None
Test Pressure -Shell Side	MI_INSPPTST_PRESS_TEST_SH_N	Numeric	None
Test Pressure - Tube Side	MI_INSPPTST_PRESS_TEST_TB_N	Numeric	None
Test Duration - Shell Side	MI_INSPPTST_DURATION_TEST_SH_N	Numeric	None
Test Duration - Tube Side	MI_INSPPTST_DURATION_TEST_TB_N	Numeric	None
Test Media Temperature - Shell Side	MI_INSPPTST_MEDIA_TEMP_SH_N	Numeric	None
Test Media Temperature - Tube Side	MI_INSPPTST_MEDIA_TEMP_TB_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
No. of Gauges Used - Shell Side	MI_INSPPTST_NO_GAUGE_USED_SH_N	Numeric	None
No. of Gauges Used - Tube Side	MI_INSPPTST_NO_GAUGE_USED_TB_N	Numeric	None
Witnessed By - Shell Side	MI_INSPPTST_WITNESS_BY_SH_C	Character (100)	Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>
Witnessed By - Tube Side	MI_INSPPTST_WITNESS_BY_TB_C	Character (100)	Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>
SRV Set Pressure - Shell Side	MI_INSPPTST_SRV_SET_PRESS_SH_N	Numeric	None
SRV Set Pressure - Tube Side	MI_INSPPTST_SRV_SET_PRESS_TB_N	Numeric	None
Test Comments - Shell Side	MI_INSPPTST_COMMENTS_TEST_SH_T	Text	None
Test Comments - Tube Side	MI_INSPPTST_COMMENTS_TEST_TB_T	Text	None

General_Finding Worksheet

On the General_Finding worksheet, you can specify General Finding records that you want to create or update.

Note: Each row represents a *unique* record, though multiple records may be related to the *same* Full Inspection.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Inspection Reference	MI_EVENT_ID	Character (255)	Values in this column must match the values entered on the Inspections worksheet, if they exist. You can link multiple records to the same Inspection.

Field Caption	Field ID	Data Type (Length)	Comments
Inspection Profile Category	MI_FIND_001_ITEM_PROFILE_CAT_C	Character (100)	A value is required. This column must only contain System Code IDs from the MI_INSPECTION_PROFILE_CATEGORY System Code Table. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table. The combination of values in the Inspection Profile Category, Inspection Profile Item, and Inspection Method Item columns must be unique.
Inspection Profile Item	MI_FIND_001_ITEM_PROFILE_C	Character (100)	A value is required. The combination of values in the Inspection Profile Category, Inspection Profile Item, and Inspection Method Item columns must be unique.
Inspection Method Item	MI_FIND_001_ITEM_METHOD_C	Character (100)	A value is required for each row. This column must only contain the System Code IDs from the MI_INSPECTION_METHOD_CATEGORY System Code Table. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table. The combination of values in the Inspection Profile Category, Inspection Profile Item, and Inspection Method Item columns must be unique.
Sequence	MI_FIND_001_SEQUENCE_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Location Details	MI_FIND_001_LOCATION_DETAILS_C	Text	None
Headline	MI_FIND_001_HEADLINE_C	Character (50)	None
Finding Summary	MI_FIND_001_SUMMARY_T	Text	None
Type	MI_FIND_001_TYPE_C	Character (100)	This column must only contain the System Code IDs from the MI_FINDING_TYPE System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
As Found Degradation Mechanism	MI_FIND_001_MECH_DET_C	Character (100)	This column must only contain the System Code IDs from the MI_DAMAGE_MECHANISM System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Damage Mode	MI_FIND_001_MODE_DET_C	Character (100)	This column must only contain the System Code IDs from the MI_DAMAGE_MODE System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Action Taken Code	MI_FIND_001_ACT_TAKEN_CODE_C	Character (100)	Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Action Taken Description	MI_FIND_001_ACT_TAKEN_DESC_T	Text	None

Field Caption	Field ID	Data Type (Length)	Comments
Predictable	MI_FIND_001_PREDICTABLE_C	Character (3)	In the baseline GE Digital APM system, This column must only contain the following System Code IDs: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Custom_Sub_Inspection Worksheet

If you have created a custom sub inspection family, on the Custom_Sub_Inspection worksheet, you can specify the custom sub inspection records that you want to create or update.

⚠**IMPORTANT:** Ensure that the custom sub inspection family that you have created is linked to the Inspections family using the Has Sub Inspections relationship definition.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Inspection Reference	MI_EVENT_ID	Character (255)	Values in this column must match the values entered for the parent Inspection on the Inspections worksheet. You can link multiple records to the same Inspection.
Sub Inspection Reference	MI_EVENT_SUB_INSP_ID	Character (255)	A value is required and must be unique. Values in this column are used to identify the custom sub inspection record.
Family ID	FMLY_ID	Character (255)	A value is required and must match the value entered for the parent Inspection family on the Inspections worksheet.

Inspection_Recommendation Worksheet

On the Inspection_Recommendation worksheet, you can specify Inspection Recommendation records that you want to create or update.

Note: Each row represents a *unique* record, though multiple records may be related to the *same* Full Inspection.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Inspection Reference	MI_EVENT_ID	Character (255)	Values in this column must match the values entered on the Inspections worksheet, if they exist. You can link multiple records to the same Full Inspection.
Recommendation ID	MI_REC_ID	Character (255)	A value is required and must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
Target Completion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	A value is required. Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Recommendation Headline	MI_REC_SHORT_DESCR_CHR	Character (255)	None
Recommendation Description	MI_REC_LONG_DESCR_TX	Text	None
Recommendation Priority	MI_REC_PRIORITY_C	Character (50)	This column must only contain the System Code IDs from the MI_PRIORITY System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Required Equipment Status	MI_REC_REQUI_EQUIP_STATU_CHR	Character (50)	This column must only contain the System Code IDs from the MI_EQUIP_OP_STATE System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.
Business Impact	MI_REC_IMPAC_CHR	Character (100)	This column must only contain the System Code IDs from the MI_BUSINESS_IMPACT System Code Table. Refer to the (Picklist) worksheet for a list of values that you can enter in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Mandatory Date	MI_REC_MANDA_DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Assigned To Name	MI_REC_ASSIG_NM_CHR	Character (255)	Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>
Author Name	MI_REC_AUTHO_NM_CHR	Character (255)	The value in this column must match an existing Security User who is assigned the Inspector, Inspection Administrator, or Inspection Supervisor Resource Role. Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>
Reviewer Name	MI_REC_REVIE_NM_CHR	Character (255)	The value in this column must match an existing Security User who is assigned the Inspection Supervisor Resource Role. Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>
Final Approver Name	MI_REC_FINAL_APPROVE_NAME_C	Character (255)	Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>
Implemented Date	MI_REC_COMPL_DATE_DT	Date	Enter a value in the following format: <Last Name>, <First Name> ~ <User ID>

Reference_Document Worksheet

On the Reference_Document worksheet, you can specify Reference Document records that you want to create or update.

Note: Each row represents a *unique* record, though multiple records may be related to the *same* Full Inspection.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match the values entered on the Assets worksheet. You can link multiple records to the same asset.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match the values entered on the Functional_Location worksheet. You can link multiple records to the same Functional Location.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match the values entered on the Assets or Functional_Location worksheet, if they exist. You can link multiple records to the same asset or Functional Location.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match the values entered on the Assets worksheet, if they exist. You can link multiple records to the same asset.
Inspection Reference	MI_EVENT_ID	Character (255)	Values in this column must match the values entered on the Inspections worksheet, if they exist. You can link multiple records to the same Full Inspection.
Reference Document ID	CTIT_ID	Character (255)	A value is required and must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
Description	CTIT_DESC_TX	Character (255)	None
Document Path	MIRD_DOC_PATH_CHR	Character (1023)	None

About the Inspection Management (IM) Data Loaders Load Verification

Following a data load, you should perform the following steps in GE Digital APM to confirm the integrity and accuracy of the data imported from the data loader workbooks:

- Access the details of the import job. These details will indicate if any errors, minor or otherwise, were encountered during the import job. The log may help account for any records that are unexpectedly absent after the data load.
- In Inspection Management or Record Manager, access the assets or Functional Locations specified in the data loader workbooks, and then verify that the expected Inspection Profiles, Inspection Methods, and Inspections are present or updated, and that any associated records that you expected to be created are also present in the database.

About RBI Data Loaders

GE Digital APM, through the Risk Based Inspection module, provides the functionality to carry out an RBI Analysis on various types of RBI components to calculate corrosion rate, and the probability and consequence of failure, and then develop intelligent strategies. Using the following RBI Data Loaders, you can generate all components for a Process Unit along with the associated analyses:

- Risk Based Inspection (RBI) 580 Data Loader
- Risk Based Inspection (RBI) 581 Data Loader

About the Risk Based Inspection (RBI) 580 Data Loader

Using the Risk Based Inspection (RBI) 580 Data Loader, you can implement Risk Based Inspection when you have RBI data in a legacy system, which is not supported by GE Digital APM. To import data using the Risk Based Inspection (RBI) 580 Data Loader, GE Digital provides an Excel template, **RBI_580_Data_Loader.xlsx**, which supports baseline Risk Based Inspection GE Digital APM. You must export your legacy system so that the data can be used to populate the template. The data from the template will then be imported into GE Digital APM using the Risk Based Inspection (RBI) 580 Data Loader.

Note: The Excel template is referred to throughout this documentation as the *data loader workbook*.

The data loader workbook can be used in the following scenarios:

- Create or update components
- Create analyses
- Loading components and risk analysis data into GE Digital APM so that you can retain visibility into the analysis details and calculations, and generate recommendations.
- Calculate risk, probability, and consequence of failure, and then utilize the Inspection Planning feature to mitigate the risk by the plan date.

After importing the data, the Risk Based Inspection (RBI) 580 Data Loader creates the following records in GE Digital APM:

- Criticality Calculator RBI Component
- RBI Criticality Analysis
- Criticality Consequence Evaluation
- Criticality Env. Crack. Deg. Mech. Eval.
- Criticality Ext. Corr. Deg. Mech. Eval.
- Criticality Int. Corr. Deg. Mech. Eval.
- Criticality Other Damage Mech. Eval.
- Criticality Custom DME
- RBI Degradation Mechanisms

The data on the (Picklist) worksheet is not loaded when you load data using the Risk Based Inspection (RBI) 580 Data Loader.

Note: This data loader workbook is not backward compatible to earlier versions of GE Digital APM.

About the Risk Based Inspection (RBI) 580 Data Loader Requirements

Before you use the Risk Based Inspection (RBI) 580 Data Loader, you must complete the following steps:

- Ensure that the Risk Based Inspection module is deployed.
- Ensure that the he Potential Degradation Mechanism library is configured correctly for custom Degradation Mechanisms.
- Baseline records will be available; however, custom records should be created prior to loading data.
- Ensure that the following data is present:
  - Site Reference
  - Equipment Taxonomy
  - Equipment and Functional Location Families
  - Process Units (i.e., Functional Location records in which the **Is Unit?** check box is selected)
  - RBI Data Mapping
  - Units of Measure Conversion Sets
  - Stress Tables (GE Digital provides Stress Tables for Pressure Vessels and Tanks. If you want to use values from these Stress Tables with the data load, you must ensure that the records are imported into your database prior to performing the data load. GE Digital does not provide Piping Stress Tables).

    Representative Fluids
- If you have added custom fields to Risk Mapping families (e.g., RBI Risk Matrix Mapping, Risk Analysis Mapping), you must ensure that mappings exist for those fields, or data may not be populated as expected after the data load. This is because the Risk Based Inspection (RBI) 580 Data Loader relies on Risk Mapping families to ensure that fields on RBI Criticality Analysis and related records are correctly populated with data, and that resulting risk values can be mapped to the Default Risk Matrix. If you have added custom fields, you must ensure that mappings exist for those fields, or data may not be populated as expected following the data load.
- The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI RBI Analyst Security Group or a Security Role that is associated with this Security Group.
- The data loader workbook contains sample data in each column. It is only for your reference. You must remove this data before using the data loader workbook.

About the Risk Based Inspection (RBI) 580 Data Loader Data Model

This content has been intentionally excluded from the GE Digital APM product documentation website. This content is available to you via the product documentation that is provided within the GE Digital APM system.

About the Risk Based Inspection (RBI) 580 Data Loader General Loading Strategy

The imported data must load in a specific sequence in order to successfully populate fields, to create records, and to link them to the predecessor and successor records.

Best Practices

When importing data using the Risk Based Inspection (RBI) 580 Data Loader, you must use the following best practices:

- ID fields must not include special characters or spaces.
- For Oracle databases, valid cell values are case-sensitive.
- Columns (including columns representing custom fields) in the worksheets should be formatted as Text.
- Import a maximum of 500 assets in each data load.
- Do not try to create and update a component in the same data loader workbook.
- Ensure that you enter values in cells that correspond to fields required to calculate an analysis. Otherwise, the analysis and related records are not created or updated after you load data.
- When a field whose value is required based on the value in another field is blank:
    - If you are using the dataloader to create the analysis, the RBI Analysis and related records will not be created.
    - If you are using the dataloader to update the analysis, the fields for which data exists are updated in the database. However, an error is logged in the log file of the import job.
- You must consider the rules described in the Workbook Layout and Use section of this document while using the Risk Based Inspection (RBI) 580 Data Loader.
- If you have entered data related to an analysis or a DME, then you must always enter data of the associated component in the RBI_Component worksheet, even if the corresponding Criticality Calculator RBI Component record exists in the GE Digital APM database.
- When you use the data loader to *create* an analysis and a cell that requires a Boolean value is blank, the corresponding field in GE Digital APM is updated with the value *False*. When you use the data loader to *update* an analysis and a cell that requires a Boolean value is blank, the corresponding field in GE Digital APM is *not updated*. Therefore, to avoid ambiguity, we recommend that you enter the value*True* or *False* in the cell and not leave it blank.
- If you want to override values that are populated from the associated component, you can include those values in the Risk Based Inspection (RBI) 580 Data Loader. For example, the value for the Operating Temperature field in an RBI Criticality Analysis is populated from the corresponding field in the associated RBI

Component. If you want to override this value for the analysis, you must include a column for Operating Temperature in the RBI_Criticality_Analysis worksheet in the data loader workbook, and enter the value in that cell.

- In addition to the fields included in the Risk Based Inspection (RBI) 580 Data Loader, if you want to add values for more fields for a record, you can add columns for those fields in the appropriate worksheet.

  Note: The fields that you want to add to the data loader workbook must already exist in the corresponding family. If not, you must add the fields to the family via Configuration Manager.

- You should not add columns that correspond to fields in the **Outputs** and **Intermediate Outputs** sections of a datasheet; Otherwise, the calculations might not be correct.
- You should not add a column that corresponds to the Use Combined Confidence field to any of the following worksheets:
  - DME_Environmental_Cracking
  - DME_External_Corrosion
  - DME_Internal_Corrosion

  The Use Combined Confidence field is part of the integration of the Risk Based Inspection and Inspection Management modules. A value should only be set in the GE Digital APM application.
- If you want to add a column to the Criticality RBI Component worksheets that corresponds to the Source of Calculated Corrosion Rate field, you must consider the following:
  - Every row (i.e., every component) on the Criticality RBI Component worksheets will require a value in the Source of Calculated Corrosion Rate column.
  - In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:
    - ASSET
    - COMPONENT
    - MANUAL

    The list in this field is populated by the MI_RBI_CALC_CORRO_SRC System Code Table. If the System Code Table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, reference the appropriate table.
  - If you want to set the Source of Calculated Corrosion Rate for a Criticality RBI Component to Component (COMPONENT), that component must be linked to a TML Group. Thickness Monitoring data should be available, and an existing, calculated Corrosion Analysis should exist in Thickness Monitoring so that the Long Term Avg. Corr. Rate and Short Term Avg. Corr. Rate fields can be correctly populated on RBI Criticality Analyses for the component.

Because the component must already be linked to a TML Group, you should not specify Component as the setting during Insert operations. You should specify Component only for Update operations.

- If you want to set the Source of Calculated Corrosion Rate for a Criticality RBI Component to Asset (ASSET), the corresponding Equipment record must already have Thickness Monitoring data available, and an existing, calculated Corrosion Analysis should exist in Thickness Monitoring so that the Long Term Avg. Corr. Rate and Short Term Avg. Corr. Rate fields can be correctly populated on RBI Criticality Analyses for the component.
- If you want to specify values for the Long Term Avg. Corr. Rate and Short Term Avg. Corr. Rate fields, set the Source of Calculated Corrosion Rate for a Criticality RBI Component to Manual Entry (MANUAL).

  By default, the value in the Source of Calculated Corrosion Rate field is Manual. Unless you want to specify one of the other valid values, you do not need to add a Source of Calculated Corrosion Rate column to the Criticality RBI Component worksheets.

Load Sequence

The data is loaded in the following sequence in order to create all necessary relationships between records:

1. The Assets worksheet is processed. The Data Loader searches for the asset that corresponds to the Equipment ID, CMMS System, and Equipment Technical Number information that you provide in the Assets worksheet.

   If an asset specified on the worksheet does not exist, it will be skipped, as well as all entries in the subsequent worksheets corresponding to that asset.

2. The RBI_Component worksheet is processed. The Data Loader searches for the RBI Component based on the asset data and the values in the Component and Component Type cells.

   If a component exists, it will be updated. If not, a new component will be created and linked to the corresponding asset.

3. The RBI_Criticality_Analysis worksheet is processed. For each row based on the cells specified in steps 1 and 2, a new analysis is created and linked to that component. You cannot update an analysis using the data loader workbook. The value in the Analysis Unique ID cell is not stored but will be used to identify corresponding Degradation Mechanism Evaluations and Consequence Evaluations specified on the subsequent worksheets that should be linked to the analysis.

   If there is invalid data for calculating an analysis, the row that corresponds to that analysis is skipped. All the Consequence Evaluations and DMEs linked to that analysis are also skipped.

4. The Consequence_Evaluation worksheet is processed. For each row based on the cells specified in steps 1 to 3, a Consequence Evaluation is created and linked to the specified analysis.
5. The worksheets representing Degradation Mechanism Evaluations are processed. For each row based on the cells specified in steps 1 to 3, a Degradation Mechanism Evaluation is created and linked to the specified analysis. Additionally, for each Damage Mechanism specified and linked to the analysis, a corresponding Potential Degradation Mechanism is created and linked to the component, unless a Potential Degradation Mechanism of the same type is already linked.

   When the Degradation Mechanism Evaluations are processed, if you have not included a Degradation Mechanism in the worksheet that corresponds to an existing Potential Degradation Mechanism on the component, that Potential Degradation Mechanism will be unlinked.

Data that you specify in the cells on each worksheet will be included in the new records. Additionally, fields in the records will be populated with data based on your RBI Data Mapping. For example, an RBI Criticality Analysis record will be populated with data from the Criticality RBI Component record to which it is linked as expected when normally using Risk Based Inspection in GE Digital APM.

About the Risk Based Inspection (RBI) 580 Data Loader Workbook Layout and Use

To import data using the Risk Based Inspection (RBI) 580 Data Loader, GE Digital APM provides an Excel workbook, **Risk Based Inspection (RBI) 580.xlsx**, which supports baseline Risk Based Inspection in GE Digital APM. This workbook must be used to perform the data load. You can modify the Excel workbook to include custom fields used by your organization.

Note: The Excel workbook is referred to throughout this documentation as the *data loader workbook*.

The following table lists the worksheets that are included in the data loader workbook.

Worksheet	Description
Assets	This worksheet is used to specify existing Equipment records to which components will be linked.
RBI_Components	This worksheet is used to specify the following types of RBI Component records that will be updated or created and linked to assets. • Cylindrical Shell • Exchanger Header • Exchanger Tube • Piping • Pump Compressor Casing • Tank Bottom
RBI_Criticality_Analysis	This worksheet is used to define RBI Criticality Analysis records that will be linked to components.
Consequence_Evaluation	This worksheet is used to define Consequence Evaluation records that will be linked to analyses.
DME_Environmental_Cracking	This worksheet is used to define Criticality Env. Crack. Deg. Mech. Eval. records and Degradation Mechanisms that will be linked to analyses.
DME_External_Corrosion	This worksheet is used to define Criticality Ext. Corr. Deg. Mech. Eval. records and Degradation Mechanisms that will be linked to analyses.

Worksheet	Description
DME_Internal_ Corrosion	This worksheet is used to define Criticality Int. Corr. Deg. Mech. Eval. records and Degradation Mechanisms that will be linked to analyses.
DME_Other	This worksheet is used to define Criticality Other Damage Mech. Eval. records and Degradation Mechanisms that will be linked to analyses.
DME_Custom	This worksheet is used to define custom Criticality Other Damage Mech. Eval. records and Degradation Mechanisms that will be linked to analyses.
Degradation_ Mechanism	This worksheet is used to define or update Damage Mechanisms that are or will be linked to the specified analyses.
(PickList)	This worksheet details the valid values available for fields that have pick lists. The field values listed in the (PickList) worksheet have been detailed in the corresponding worksheet. When you load data using the data loader, the data on this worksheet is *not* loaded.

Color Coding

Certain columns on the worksheets have different functions and requirements. To illustrate this, certain columns are color-coded. The following table lists the colors and what they represent.

Color	Description	Comments
	Required Key Fields	Indicates columns that contain values that are used by the Risk Based Inspection (RBI) 580 Data Loader to look up and create records. If these columns are removed from the worksheets, the data load will fail. While the worksheets require that these columns be present, values are not necessarily required in these columns.
	Fields Required for Calculation	Indicates columns that contain values that are required to perform calculations in Risk Based Inspection. Some cells only require values in certain cases. Such cases are found in parentheses in the first row of each worksheet.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for Risk Based Inspection, should contain values.
	Custom Fields	Indicates columns where you can specify custom fields.

Limitations

The Risk Based Inspection (RBI) 580 Data Loader has the following limitations:

- You must use the data loader workbook. If you modify the format of the values in columns in any of the worksheets, you will not be able to import data.
- The values that you enter in the data loader workbook are case-sensitive.
- If you reimport data, the records that have been created by the Risk Based Inspection (RBI) 580 Data Loader will be *updated*. Therefore, while reimporting data, if you remove the data for a field in the data loader workbook, the value for the corresponding field in GE Digital APM will be blank.
- When you use the data loader to update an RBI Analysis and the associated Consequence Evaluation, Damage Mechanisms, and Damage Mechanism Evaluations:
  - If a cell contains data, the value in the corresponding field will be updated in the database.
  - If a cell is blank, the value in the corresponding field will *not be updated* with a blank value in the database. The value that previously existed in the field is retained.
- You cannot delete the Consequence Evaluation and the Degradation Mechanism Evaluations associated with an RBI Analysis using the data loader.
- You cannot update a What-If analysis using the data loader.

Assets Worksheet

On the Assets worksheet, you will specify assets to which you want to link components. The columns that appear on this worksheet also appear on every subsequent worksheet, and are used to identify the records that will be linked, directly or indirectly, to the assets.

Note: Each row in this worksheet represents a unique asset. You should not include the same asset more than once.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment record for an asset has a value in the CMMS System field, that value is required in this cell.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, that value is required in this cell. If there is no value in the CMMS System field, this cell can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.

RBI_Components Worksheet

On the RBI Components worksheet, you will specify the Criticality RBI Component records that you want to create or update.

Note: Each row represents a *unique* component, though multiple components may be related to the *same* asset.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 1" Pipe • 1.25" Pipe • 1.5" Pipe • 1/2" Pipe • 10" Pipe • 102" Pipe • 12" Pipe • 14" Pipe • 16" Pipe • 18" Pipe • 2" Pipe • 2.5" Pipe • 20" Pipe • 24" Pipe • 26" Pipe • 28" Pipe • 3" Pipe • 3/4" Pipe • 30" Pipe • 32" Pipe • 34" Pipe • 36" Pipe • 4" Pipe

Field Caption	Field ID	Data Type (Length)	Comments
			• 40" Pipe • 42" Pipe • 48" Pipe • 5" Pipe • 54" Pipe • 56" Pipe • 6" Pipe • 60" Pipe • 8" Pipe • 90" Pipe • Air Cooled Exchanger-Header • Air Cooled Exchanger-Tbs • Balanced Bellows PRD • Column-Bottom • Column-Middle • Column-Top • Compressor • Filter • Fin/Fan Cooler • Heat Exchanger-Bundle • Heat Exchanger-Channel • Heat Exchanger-Shell • Pressure Vessel • Reactor • Storage Tank • Storage Tank Bottom

Field Caption	Field ID	Data Type (Length)	Comments
Component Family	FAMILY_ID		In the baseline GE Digital APM system, this cell may only contain one of the following values: • Criticality RBI Component - Cylindrical Shell • Criticality RBI Component - Exchanger Bundle • Criticality RBI Component - Exchanger Header • Criticality RBI Component - Exchanger Tube • Criticality RBI Component - Piping • Criticality RBI Component - Tank Bottom
Component Description	MI_RBICOMPO_COMPO_DESCR_C	Character (255)	A value is required if the value in the Toxic Mixture cell is *True*.
Component Date in Service	MI_RBICOMPO_COMP_STRT_DATE_DT	Date	A value is required if a Criticality Ext. Corr. Deg. Mech. Eval., Criticality Int. Corr. Deg. Mech. Eval., or Criticality Env. Crack. Deg. Mech. Eval. record will be created for an analysis linked to this component.
Circuit From	MI_CCRBICPI_CIRCU_FROM_C	Character (250)	None

Field Caption	Field ID	Data Type (Length)	Comments
Circuit To	MI_CCRBICPI_CIRCU_TO_C	Character (250)	None
Component Comments	MI_RBICOMPO_COMPO_COMME_TX	Text	None
Operating Pressure	MI_RBICOMPO_OPERA_PRESS_N	Numeric	A value is required. The value in this cell is copied to the Operating Pressure field of the associated RBI Analysis. The value in this cell must be less than or equal to the value in the Design Pressure cell for the analysis to be created.
Operating Pressure - Shell	MI_CCRBICEB_OPER_PRES_SHEL_N	Numeric	A value is required.
Operating Temperature	MI_RBICOMPO_OPERA_TEMPE_N	Numeric	A value is required. The value in this cell is copied to the Operating Temperature field of the associated RBI Analysis. The value in this cell must be less than or equal to the value in the Design Temperature cell for the analysis to be created.
Operating Temperature - Shell	MI_CCRBICEB_OP_TEMP_SHEL_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Area Humidity	MI_CCRBICOM_AREA_HUMID_C	Character (100)	A value is required if a Criticality Ext. Corr. Deg. Mech. Eval. record will be created for an analysis linked to this component. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Low • Medium • High If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Area Humidity field for Criticality RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments
Foundation Type	MI_CCRBICTB_FOUND_TYPE_C	Character (50)	A value is required for RBI Storage Tank Bottom Components. This cell may only contain one of the following values: • Clay • Silt • Sand • Gravel • Concrete • Double Floor The list in this field is populated by the FOUNDATION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Initial Fluid Phase	MI_RBICOMPO_INIT_FLU_PHASE_C	Character (20)	A value is required for each row. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Liquid • Gas The list in this field is populated by the FLUID TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Initial Fluid Phase - Shell Side	MI_CCRBICEB_INI_FD_PHS_SH_SD_C	Character (20)	A value is required for each row. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Liquid • Gas The list in this field is populated by the FLUID TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table. This field is only required for Exchanger Bundle RBI Components.

Field Caption	Field ID	Data Type (Length)	Comments
Process Fluid	MI_RBICOMPO_PROCE_FLUID_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 15% H2 • 2-Methoxyethanol • Acetic Acid • Acetic Anhydride • Acetone • Acetonitrile • Acid • ACR (Acrolein) • AIR • ALCL3 • Amine • AN (Acrylonitrile) • Asphalt • Benzine • BF3 • C1 • C10 (Kerosene) • C11 • C12 • C13-16 (Diesel) • C17-25 (Gas Oil) • C2 • C25+ (Resid)

Field Caption	Field ID	Data Type (Length)	Comments
			• C3 • C4 • C5 • C6 • C7 • C8 (Gasoline) • C9 • Calcium Acetate • Calcium Chloride • Caustic (20%) • CCL4 • Chlorine • CO • CO2 • Crude • DEE • Diesel • DMDS (Di-methyl disulfide) • DMF (Dimethyl Floride) • DMS (Dimethyl Sulfide) • EDA (Ethylenediamine) • EE • EEA • EG • Eliminox • EO • ETOH (Ethanol)

Field Caption	Field ID	Data Type (Length)	Comments
			• Freon 22 • Fuel Oil • Furfural • Gasoline • Glycol • H2 • H2O (Water) • H2S • H2SO4 • HCHO • HCl • HCN • HF • Hydrazine • Hydroquinone • IPAC (Isopropyl Alcohol) • Kerosene • Ketene • KOH • MDEA • ME • MEK (Methyl Ethyl Keytone) • MEO (Methyl Ethyl Oleate) • MEOH (Methanol) • Methanol Brine • Methyl Mercaptan • Methylene Chloride

Field Caption	Field ID	Data Type (Length)	Comments
			• MTBE • N2 • Na2SO3 • NAOH • Naptha • NH3 • Nitric Acid • NO2 • Oleum • Perchloroethylene • Perchloromethylmercaptan • Peroxide • Petroleum Gases • Phosgene • PO • Propanol • Propionitrile • Propylene Oxide • Pyrophoric • Steam • Styrene (Aromatic) • Sulfur • Sulfur Dioxide • Sulfur Trioxide • TBA (Tert-Butyl Alcohol) • TDI • Toluene

Field Caption	Field ID	Data Type (Length)	Comments
			• TSP (Trisodium Phosphate) • VAM • Xylene

Field Caption	Field ID	Data Type (Length)	Comments
Process Fluid - Shell Side	MI_CCRBICEB_PROC_FD_SH_SD_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 15% H2 • 2-Methoxyethanol • Acetic Acid • Acetic Anhydride • Acetone • Acetonitrile • Acid • ACR (Acrolein) • AIR • ALCL3 • Amine • AN (Acrylonitrile) • Asphalt • Benzine • BF3 • C1 • C10 (Kerosene) • C11 • C12 • C13-16 (Diesel) • C17-25 (Gas Oil) • C2 • C25+ (Resid)

Field Caption	Field ID	Data Type (Length)	Comments
			• C3 • C4 • C5 • C6 • C7 • C8 (Gasoline) • C9 • Calcium Acetate • Calcium Chloride • Caustic (20%) • CCL4 • Chlorine • CO • CO2 • Crude • DEE • Diesel • DMDS (Di-methyl disulfide) • DMF (Dimethyl Floride) • DMS (Dimethyl Sulfide) • EDA (Ethylenediamine) • EE • EEA • EG • Eliminox • EO • ETOH (Ethanol)

Field Caption	Field ID	Data Type (Length)	Comments
			• Freon 22 • Fuel Oil • Furfural • Gasoline • Glycol • H2 • H2O (Water) • H2S • H2SO4 • HCHO • HCl • HCN • HF • Hydrazine • Hydroquinone • IPAC (Isopropyl Alcohol) • Kerosene • Ketene • KOH • MDEA • ME • MEK (Methyl Ethyl Keytone) • MEO (Methyl Ethyl Oleate) • MEOH (Methanol) • Methanol Brine • Methyl Mercaptan • Methylene Chloride

Field Caption	Field ID	Data Type (Length)	Comments
			• MTBE • N2 • Na2SO3 • NAOH • Naptha • NH3 • Nitric Acid • NO2 • Oleum • Perchloroethylene • Perchloromethylmercaptan • Peroxide • Petroleum Gases • Phosgene • PO • Propanol • Propionitrile • Propylene Oxide • Pyrophoric • Steam • Styrene (Aromatic) • Sulfur • Sulfur Dioxide • Sulfur Trioxide • TBA (Tert-Butyl Alcohol) • TDI • Toluene

Field Caption	Field ID	Data Type (Length)	Comments
			• TSP (Trisodium Phosphate) • VAM • Xylene
Toxic Mixture	MI_RBICOMPO_TOXIC_MIX_F	Boolean	Enter *True* or *False*. A value is required if the value in the Toxic Mixture cell is *True*.

Field Caption	Field ID	Data Type (Length)	Comments
Toxic Fluid	MI_RBICOMPO_TOXIC_MODEL_C	Character (50)	A value is required if the value in the Toxic Mixture cell is *True*. In the baseline GE Digital APM system, this cell may only contain one of the following values: • ACR (Acrolein) • ALCL3 • AN (Acrylonitrile) • BF3 • Chlorine • CO • EE • EO • H2S • HCHO • HCl • HCN • HF • Hydrazine • Methyl Mercaptan • NH3 • Nitric Acid • NO2 • Perchloromethylmercaptan • Phosgene • Propionitrile • Propylene Oxide

Field Caption	Field ID	Data Type (Length)	Comments
			• Sulfur Trioxide • TDI • VAM
Percent Toxic	MI_RBICOMPO_PERCE_TOXIC_N	Numeric	A value is required if the value in the Toxic Mixture cell is *True*.
Toxic Mixture - Shell Side	MI_CCRBICEB_TOX_MX_SH_SD_C	Boolean	Enter *True* or *False*. A value is required if the value in the Toxic Mixture - Shell cell is *True*.

Field Caption	Field ID	Data Type (Length)	Comments
Toxic Fluid - Shell Side	MI_CCRBICEB_TOX_FLD_SH_SD_C	Character (50)	A value is required if the value in the Toxic Mixture - Shell Side cell is *True*. In the baseline GE Digital APM system, this cell may only contain one of the following values: • ACR (Acrolein) • ALCL3 • AN (Acrylonitrile) • BF3 • Chlorine • CO • EE • EO • H2S • HCHO • HCl • HCN • HF • Hydrazine • Methyl Mercaptan • NH3 • Nitric Acid • NO2 • Perchloromethylmercaptan • Phosgene • Propionitrile • Propylene Oxide

Field Caption	Field ID	Data Type (Length)	Comments
			• Sulfur Trioxide • TDI • VAM
Percent Toxic - Shell Side	MI_CCRBICEB_PER_TOX_SHEL_SD_N	Numeric	A value is required if the value in the Toxic Mixture - Shell Side cell is *True*.
Inventory	MI_RBICOMPO_INVEN_N	Numeric	A value is required if: • The Component Type is Storage *Tank*. -and- • The value in the Use Calculated Inventory cell in the corresponding row on the Consequence_Evaluation worksheet is blank or *False.*
Detection Time	MI_CCRBICOM_DETEC_TIME_N	Numeric	A value is required.
Isolation Time	MI_CCRBICOM_ISOLA_TIME_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Design Pressure	MI_RBICOMPO_DESIG_PRESS_N	Numeric	A value is required for External Damage DMs, AST DMs, or Thinning and Lining DMs. The value in this cell is copied to the Design Pressure field of the associated RBI Analysis. The value in this cell must be greater than or equal to the value in the Operating Pressure cell for the analysis to be created.
Design Pressure - Shell Side	MI_CCRBICEB_DES_PRES_SHEL_SD_N	Numeric	A value is required for a component of type *Exchanger Bundle*.
Design Temperature	MI_RBICOMPO_DESIG_TEMPE_N	Numeric	A value is required for External Damage DMs, AST DMs, and Thinning and Lining DMs. The value in this cell is copied to the Design Temperature field of the associated RBI Analysis. The value in this cell must be greater than or equal to the value in the Operating Temperature cell for the analysis to be created.
Design Temperature - Shell Side	MI_CCRBICEB_DES_TEMP_SH_SD_N	Numeric	A value is required for a component of type *Exchanger Bundle*.
Diameter	MI_RBICOMPO_DIAME_INNER_N	Numeric	A value is required if the Component Type is Storage *Tank*.

Field Caption	Field ID	Data Type (Length)	Comments
Length	MI_RBICOMPO_LENGT_N	Numeric	A value is required in order to populate the Calculated Inventory field.
Fill Height	MI_CCRBICTB_FILL_HEIGH_N	Numeric	A value is required if the Component Type is Storage *Tank*.
Nominal Thickness	MI_RBICOMPO_NOMIN_THICK_N	Numeric	A value is required for External Damage DMs, AST DMs, and Thinning and Lining DMs.
Stress Lookup Table	MI_RBICOMPO_STRESS_TABLE_C	Character (50)	A value is required for External Damage DMs, AST DMs, Thinning and Lining DMs, and Brittle Fracture DMs. This cell may only contain one of the following values: • Pressure Vessels • Tanks • Piping If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Stress Lookup Table field for Criticality RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments
BM CODE	MI_RBICOMPO_BM_CODE_C	Character (30)	A value is required for External Damage DMs, AST DMs, Thinning and Lining DMs, and Brittle Fracture DMs. Refer to the (Picklist) worksheet in the excel workbook for valid values that you enter in this cell.
BM YEAR	MI_RBICOMPO_BM_YEAR_C	Character (50)	A value is required for External Damage DMs, AST DMs, Thinning and Lining DMs, and Brittle Fracture DMs. Refer to the (Picklist) worksheet in the excel workbook for valid values that you enter in this cell.
BM SPEC	MI_RBICOMPO_BM_SPEC_C	Character (50)	A value is required for External Damage DMs, AST DMs, Thinning and Lining DMs, and Brittle Fracture DMs. Refer to the (Picklist) worksheet in the excel workbook for valid values that you enter in this cell.
BM GRADE	MI_RBICOMPO_BM_GRADE_C	Character (50)	A value is required for External Damage DMs, AST DMs, Thinning and Lining DMs, and Brittle Fracture DMs. Refer to the (Picklist) worksheet in the excel workbook for valid values that you enter in this cell.

Field Caption	Field ID	Data Type (Length)	Comments
Weld Joint Effy	MI_RBICOMPO_WELD_JOINT_EFFY_N	Numeric	A value is required for External Damage DMs, AST DMs, and Thinning and Lining DMs. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 0.35 • 0.4 • 0.45 • 0.5 • 0.55 • 0.6 • 0.65 • 0.7 • 0.75 • 0.8 • 0.85 • 0.9 • 0.95 • 1.0 If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in theWeld Joint Effyfield for Criticality RBI Component records.
Insulated?	MI_RBICOMPO_INSUL_F	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Insulation Type	MI_RBICOMPO_INSUL_C	Character (200)	A value is required if the value in the Insulated? cell is *True*. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Asbestos • Calcium Silicate (Cl Free) • Calcium Silicate (Not Cl Free) • Foam/Cellular Glass • Mineral Wool/Fiber Glass • Pearlite • Unknown
Piping Circuit Length	MI_CCRBICPI_PIP_CIR_LENG_N	Numeric	A value is required in order to populate the Calculated Inventory field. This field is only required for RBI Pipeline Components.
PWHT	MI_CRENCDME_PWHT_F	Boolean	Enter *True* or *False*.
Course Number	MI_CCRBICTB_COURS_NUM_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Is Entry Possible?	MI_CRENCDME_IS_ENTRY_POSS_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Corrosive Product	MI_CCRBICOM_CORRO_PRODU_C	Character (250)	None

Field Caption	Field ID	Data Type (Length)	Comments
Internal Corrosion Type	MI_RBICOMPO_INTER_CORR_TYPE_C	Character (50)	While not required, it is recommended you enter a value in this cell. This field is used when generating RBI Recommendations. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Localized • Pitting • General If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Internal Corrosion Type field for Criticality RBI Component records.
Internal Corrosion Type - Shell Side	MI_CCRBICEB_INT_COR_TP_SH_SD_C	Character (50)	This field is used when generating RBI Recommendations. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Localized • Pitting • General If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Internal Corrosion Type field for Criticality RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments
Predictable Int. Corr. Location	MI_CCRBICOM_PRED_INT_COR_LOC_F	Boolean	Enter *True* or *False*.
Pred_Int_Corr_Location - Shell Side	MI_CCRBICEB_PRD_INT_CR_LC_SH_F	Boolean	Enter *True* or *False*.
Estimated Internal Corrosion Rate	MI_RBICOMPO_EXP_INT_CORR_RT_N	Numeric	A value is required in this cell if a Criticality Int. Corr. Deg. Mech. Eval. record will be created for an analysis linked to this component.
Estimated External Corrosion Rate	MI_RBICOMPO_EXP_EXT_CORR_RT_N	Numeric	A value is required in this cell if a Criticality Ext. Corr. Deg. Mech. Eval. record will be created for an analysis linked to this component.
Measured External Corrosion Rate	MI_RBICOMPO_MEAS_EXT_COR_RT_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Source of Calculated Corrosion Rates	MI_CCRBICOM_CALCD_CR_SRC_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • ASSET • COMPONENT • MANUAL The list in this field is populated by the MI_RBI_CALC_CORRO_SRC System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

RBI_Criticality_Analysis Worksheet

On the RBI_Criticality_Analysis worksheet, you will specify RBI Criticality Analysis records that you want to create.

Note: Each row represents a *unique* analysis, though multiple analyses may be related to the *same* asset.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	N/A	This cell is required, but is only used in the context of the workbook. The Risk Based Inspection (RBI) 580 Data Loader uses the value in this cell to match and link Consequence Evaluations and Degradation Mechanism Evaluations to the analysis.
Scenario ID	MI_CRITANAL_TURNAROUND_ID_C	Character (100)	While not required, it is recommended you enter a value in this cell.
Scenario Reference Date	MI_CRITANAL_TURN_AROUN_DATE_D	Date	While not required, it is recommended you enter a value in this cell.
Allowable Stress Override	MI_CRITANAL_MTL_A_STRESS_OVR_F	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Allowable Stress	MI_CRITANAL_MTL_ALLOW_STRESS_N	Numeric	If the Allowable Stress Override cell is *True*, a value is required in this cell. Required only for RBI Analysis records that are linked to Criticality Int. Corr. Deg. Mech. Eval. or Criticality Ext. Corr. Deg. Mech. Eval. records.

Consequence_Evaluation Worksheet

On the Consequence_Evaluation worksheet, you will specify Consequence Evaluations that you want to create and link to RBI Criticality Analysis records.

Note: Each row represents a unique Consequence Evaluation. Only one Consequence Evaluation can be linked to an analysis, unless you specify a different Consequence for each Consequence Evaluation.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	N/A	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.
Consequence	MI_RCONEVAL_CONS_C	Character (50)	A value is required in this cell if you are creating more than one Consequence Evaluation for the same analysis. If left blank, the Consequence field will be populated with the value *RBI*.
Comments	MI_RCONEVAL_COMM_TX	Text	None
Inventory Group	MI_RCONEVAL_INV_GRP_C	Character (100)	None
Number of Towers	MI_CRCOEVAL_NUM_OF_TOW_N	Numeric	None
Number of Storage Tanks	MI_CRCOEVAL_NUM_STO_TNKS_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Number of Vessels	MI_CRCOEVAL_NUM_OF_VESS_N	Numeric	None
Use Calculated Inventory	MI_CRCOEVAL_USE_CALC_INV_F	Boolean	Enter *True* or *False*.
Inspection Interval	MI_CRCOEVAL_INSPE_INTER_N	Numeric	A value is required if the component to which the analysis is linked is a Storage Tank or Tank Bottom.
Consequence Near Ignition Source	MI_CRCOEVAL_CON_NEAR_IGN_SRC_F	Boolean	Enter *True* or *False*.
Bottom Thickness	MI_CRCOEVAL_BOT_THK_N	Numeric	None
Diked?	MI_CRCOEVAL_DIKED_F	Boolean	Enter *True* or *False*.
Diked Area	MI_CRCOEVAL_DIKED_AREA_N	Numeric	None
Persistent Fluid?	MI_CRCOEVAL_PERS_FLUID_F	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Leak Effect	MI_CRCOEVAL_LEAK_EFFEC_C	Character (50)	A value is required if the component to which the analysis is linked is a Storage Tank or Tank Bottom. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Ground • Surface Water • Ground Water If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Leak Effect field for Consequence Evaluation records.
Unit Cleanup Cost	MI_CRCOEVAL_UNIT_CLEAN_COST_N	Numeric	None
Underside Corrosion Rate	MI_CRCOEVAL_UNDER_COR_RT_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(Flammable) Leak Type	MI_CRCOEVAL_LEAK_TYPE_C	Character (150)	In the baseline GE Digital APM system, this cell may only contain one of the following values: • Catastrophic • HC->Utility • Utility->HC If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Flammable Leak Type field for Consequence Evaluation records.
Toxic Leak Type	MI_CRCOEVAL_TOX_LK_TYPE_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values: • Catastrophic • Toxic->Utility • Toxic->Process • Leak->Toxic If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Toxic Leak Type field for Consequence Evaluation records.
Product Unit Value	MI_CRCOEVAL_PROD_UNIT_VAL_C	Character (150)	None

DME_Environmental_Cracking Worksheet

On the DME_Environmental_Cracking worksheet, you will specify Degradation Mechanisms related to Environmental Cracking that you want to create and link to RBI

Criticality Analysis records. For each Degradation Mechanism, a Degradation Mechanism Evaluation is created and linked to the specified analysis. Additionally, a corresponding Potential Degradation Mechanism is created and linked to the specified component.

Note: Each row represents a *unique* Degradation Mechanism. Only one of *each type* of Degradation Mechanism can be linked to an analysis. For example, the same analysis could have a *Carbonate Cracking* Degradation Mechanism and a *Caustic Cracking* Degradation Mechanism, but *not* two Carbonate Cracking Degradation Mechanisms.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	The value in this cell must be a Degradation Mechanism that corresponds to a Criticality Env. Crack. Deg. Mech. Eval. record. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Amine Cracking (ASCC) • Carbonate Cracking • Caustic Cracking • Chloride Stress Corrosion Cracking (Cl SCC) • Hydrogen Stress Cracking (HSC)-Hydrofluoric Acid • Polythionic Acid SCC (PTA) • Sulfide Stress Cracking (SSC) • Wet H2S (Blistering, SOHIC, HIC, SSC)
Damage Comments	MI_RBDEMEEV_DAM_COM_T	Text	None
Inspection Date	MI_CRDEMEEV_INSP_DATE_D	Date	None

Field Caption	Field ID	Data Type (Length)	Comments
Number of Inspections	MI_CRDEMEEV_NUM_INSP_N	Numeric	In the baseline GE Digital APM system, this cell may only contain a numeric value between *1 -20.*
Inspection Confidence	MI_CRDEMEEV_INSP_CONF_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Low • Medium • High • Very High
Damaged At Last Inspection	MI_CRENCDME_DAM_LST_INS_F	Boolean	Enter *True* or *False*.
Env. Cracking Higher Levels	MI_CRENCDME_ENV_CRK_HI_LEV_F	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Initial Potential	MI_RBDEMEEV_ESTIM_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Low • Medium • High If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Initial Potential field for Criticality Env. Crack. Deg. Mech. Eval. records.
Cyanides?	MI_RBDEMEEV_CYANI_F	Boolean	Enter *True* or *False*.
Free Water	MI_RBDEMEEV_FREE_WATER_N	Numeric	None
H2S Content	MI_RBDEMEEV_H2S_CON_C	Character (50)	None
HIC Resistant Steel	MI_CRENCDME_HIC_RESIS_STE_F	Boolean	Enter *True* or *False*.
Stable Scale	MI_CRENCDME_STAB_SCALE_F	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
PT or MT Access?	MI_CRENCDME_PT_OR_MT_ACCES_C	Character (50)	While not required, it is recommended you enter a value in this cell. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

DME_External_Corrosion Worksheet

On the DME_External_Corrosion worksheet, you will specify Criticality Calculator External Corrosion Degradation Mechanisms that you want to create and link to RBI Criticality Analysis records. For each Degradation Mechanism, a Degradation Mechanism Evaluation is created and linked to the specified analysis. Additionally, a corresponding Potential Degradation Mechanism is created and linked to the specified component.

Note: Each row represents a unique Degradation Mechanism. Only one Criticality Calculator External Corrosion Degradation Mechanism can be linked to an analysis.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	The value in this cell must be Criticality Calculator Internal Corrosion.
Damage Comments	MI_RBDEMEEV_DAM_COM_T	Text	None

Field Caption	Field ID	Data Type (Length)	Comments
Insulation Condition	MI_RBDEMEEV_INSUL_CON_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values: • Good • Fair • Poor If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Coating Quality field for Criticality Ext. Corr. Deg. Mech. Eval records.
Coating Quality	MI_RBDEMEEV_COAT_QUAL_C	Character (50)	A value is required if the value in the Coating Present? cell is *Y*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • NONE • POOR • MEDIUM • HIGH The list in this field is populated by the MI_RBI_Coating_Quality System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Selected Corrosion Rate	MI_RBDEMEEV_SEL_CORR_RATE_N	Numeric	A value is required for each row. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • 0 • 1 • 3 For this field: • 0 corresponds to Estimated Rate. • 1 corresponds to Average Rate. • 3 corresponds to Calculated Rate. The list in this field is populated by the RBI_INT_COR_TYP System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Measured Corrosion Rate	MI_RBDEMEEV_BM_MEASU_RT_N	Numeric	A value is required if the value in the Selected Corrosion Rate column is 1.
Inspection Date	MI_CRDEMEEV_INSP_DATE_D	Date	None

Field Caption	Field ID	Data Type (Length)	Comments
Number of Inspections	MI_CRDEMEEV_NUM_INSP_N	Numeric	A value is required.
Inspection Confidence	MI_CRDEMEEV_INSP_CONF_C	Character (50)	A value is required. This cell may only contain the ID of a System Code listed in the INSPECTION CONFIDENCE, MI_RBI_REFERENCES, and MI_RBI_INSPCONF System Code Tables. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Near Cooling Tower?	MI_RBDEMEEV_N_COOL_TOWER_F	Boolean	Enter *True* or *False*.

DME_Internal_Corrosion Worksheet

On the **DME_Internal_Corrosion** worksheet, you will specify Criticality Calculator Internal Corrosion Degradation Mechanisms that you want to create and link to RBI Criticality Analysis records. For each Degradation Mechanism, a Degradation Mechanism Evaluation is created and linked to the specified analysis. Additionally, a corresponding Potential Degradation Mechanism is created and linked to the specified component.

Note: Each row represents a *unique* Degradation Mechanism. Only one Criticality Calculator Internal Corrosion Degradation Mechanism can be linked to an analysis.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	The value in this cell must be *Criticality Calculator Internal Corrosion*.

Field Caption	Field ID	Data Type (Length)	Comments
Damage Comments	MI_RBDEMEEV_DAM_COM_T	Text	None
Selected Corrosion Rate	MI_RBDEMEEV_SEL_CORR_RATE_N	Numeric	A value is required for each row. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • 1 • 2 • 3 For this field: • 1 corresponds to Estimated Rate. • 2 corresponds to Short Term Avg. • 3 corresponds to Long Term Avg. • 3 corresponds to Controlling Corrosion Rate. The list in this field is populated by the RBI_INT_COR_TYP System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Long Term Avg. Corr. Rate	MI_CRINCDME_LONG_TRM_AV_C_RT_N	Numeric	If the Selected Corrosion Rate cell is *Long Term Avg.*, a value is required in this cell.

Field Caption	Field ID	Data Type (Length)	Comments
Short Term Avg. Corr. Rate	MI_CRINCDME_SHRT_TRM_A_C_RT_N	Numeric	If the Selected Corrosion Rate cell is *Short Term Avg.*, a value is required in this cell.
Thinning Type	MI_RBDEMEEV_THIN_TYPE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • General • Localized • Pitting
Inspection Date	MI_CRDEMEEV_INSP_DATE_D	Date	None
Number of Inspections	MI_CRDEMEEV_NUM_INSP_N	Numeric	A value is required. In the baseline GE Digital APM system, this cell may only contain a numeric value between 1 and 20.
Inspection Confidence	MI_CRDEMEEV_INSP_CONF_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Low • Medium • High • Very High

Field Caption	Field ID	Data Type (Length)	Comments
Predictable	MI_CRINCDME_PRED_C	Character (50)	While not required, it is recommended you enter a value in this cell. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

DME_Other Worksheet

On the DME_Other worksheet, you will specify Degradation Mechanisms related that you want to create and link to RBI Criticality Analysis records. For each Degradation Mechanism, a Degradation Mechanism Evaluation is created and linked to the specified analysis. Additionally, a corresponding Potential Degradation Mechanism is created and linked to the specified component.

Note: Each row represents a *unique* Degradation Mechanism. Only one of *each type* of Degradation Mechanism can be linked to an analysis. For example, the same analysis could have a *Carbonate Cracking* Degradation Mechanism and a *Caustic Cracking* Degradation Mechanism, but *not* two Carbonate Cracking Degradation Mechanisms.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	The value in this cell must be a Degradation Mechanism that corresponds to a Criticality Other Damage Mech. Eval. record. The value in this cell is used to create the Degradation Mechanism for the Degradation Mechanism Evaluation that will be linked to the analysis, as well as the corresponding Potential Degradation Mechanism that will be related to the component. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 885 Embrittlement • Brittle Fracture • Carburization • Creep • Erosion • Ext Chloride SCC • Graphitization • Hot Hydrogen Attack • Hydrogen Embrittlement • Hydrogen Induced Cracking • Liquid Metal Embrittlement • Mechanical Fatigue • Microbiologically Induced Corrosion • Phase Change Embrittlement • Refractory Failure • Temper Embrittlement • Thermal Fatigue

Field Caption	Field ID	Data Type (Length)	Comments
			• Wet H2S Damage
Probability Category	MI_RBDEMEEV_LIKE_CAT_C	Character (50)	While not required, it is recommended you enter a value in this cell. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 1 • 2 • 3 • 4 • 5
Damage Comments	MI_RBDEMEEV_DAM_COM_T	Text	None

DME_Custom Worksheet

On the DME_Other worksheet, you will specify custom Degradation Mechanisms that you want to create and link to RBI Criticality Analysis records. For each Degradation Mechanism, a Degradation Mechanism Evaluation is created and linked to the specified analysis. Additionally, a corresponding Potential Degradation Mechanism is created and linked to the specified component.

Note: Each row represents a *unique* custom Degradation Mechanism. Only one of *each type* of Degradation Mechanism can be linked to an analysis. For example, the same analysis could have a *Carbonate Cracking* Degradation Mechanism and a *Caustic Cracking* Degradation Mechanism, but *not* two Carbonate Cracking Degradation Mechanisms.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	The value in this cell must be a Degradation Mechanism that corresponds to a Criticality Other Damage Mech. Eval. record. The value in this cell is used to create the Degradation Mechanism for the Degradation Mechanism Evaluation that will be linked to the analysis, as well as the corresponding Potential Degradation Mechanism that will be related to the component. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Amine Cracking (ASCC) • Carbonate Cracking • Caustic Cracking • Chloride Stress Corrosion Cracking (Cl SCC) • Hydrogen Stress Cracking (HSC)- Hydrofluoric Acid • Polythionic Acid SCC (PTA) • Sulfide Stress Cracking (SSC) • Wet H2S (Blistering, SOHIC, HIC, SSC) • Criticality Calculator External Corrosion • Criticality Calculator Internal Corrosion • 885 Embrittlement • Brittle Fracture

Field Caption	Field ID	Data Type (Length)	Comments
			• Carburization • Creep • Erosion • Ext Chloride SCC • Graphitization • Hot Hydrogen Attack • Hydrogen Embrittlement • Hydrogen Induced Cracking • Liquid Metal Embrittlement • Mechanical Fatigue • Microbiologically Induced Corrosion • Phase Change Embrittlement • Refractory Failure • Temper Embrittlement • Thermal Fatigue • Wet H2S Damage
DME Family	MI_DME_FAMILY	Character (50)	A value is required.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Probability Category</td><td>MI_RBDEMEEV_LIKE_CAT_C</td><td>Character (50)</td><td>While not required, it is recommended you enter a value in this cell.

In the baseline GE Digital APM system, this cell may only contain one of the following values:

<table>
<tr><th>Degradation Mechanism</th><th>Ranking</th></tr>
<tr><td>Brittle Fracture</td><td>1</td></tr>
<tr><td>Brittle Fracture</td><td>2</td></tr>
<tr><td>Brittle Fracture</td><td>3</td></tr>
<tr><td>Brittle Fracture</td><td>4</td></tr>
<tr><td>Brittle Fracture</td><td>5</td></tr>
<tr><td>Carburization</td><td>1</td></tr>
<tr><td>Carburization</td><td>2</td></tr>
<tr><td>Carburization</td><td>3</td></tr>
<tr><td>Carburization</td><td>4</td></tr>
<tr><td>Carburization</td><td>5</td></tr>
<tr><td>Creep</td><td>1</td></tr>
<tr><td>Creep</td><td>2</td></tr>
<tr><td>Creep</td><td>3</td></tr>
<tr><td>Creep</td><td>4</td></tr>
<tr><td>Creep</td><td>5</td></tr>
<tr><td>Erosion</td><td>1</td></tr>
</table>
</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
			<table><tr><th>Degradation Mechanism</th><th>Ranking</th></tr><tr><td>Erosion</td><td>2</td></tr><tr><td>Erosion</td><td>3</td></tr><tr><td>Erosion</td><td>4</td></tr><tr><td>Erosion</td><td>5</td></tr><tr><td>Ext Chloride SCC</td><td>1</td></tr><tr><td>Ext Chloride SCC</td><td>2</td></tr><tr><td>Ext Chloride SCC</td><td>3</td></tr><tr><td>Ext Chloride SCC</td><td>4</td></tr><tr><td>Ext Chloride SCC</td><td>5</td></tr><tr><td>Graphitization</td><td>1</td></tr><tr><td>Graphitization</td><td>2</td></tr><tr><td>Graphitization</td><td>3</td></tr><tr><td>Graphitization</td><td>4</td></tr><tr><td>Graphitization</td><td>5</td></tr><tr><td>Hot Hydrogen Attack</td><td>1</td></tr><tr><td>Hot Hydrogen Attack</td><td>2</td></tr><tr><td>Hot Hydrogen Attack</td><td>3</td></tr><tr><td>Hot Hydrogen Attack</td><td>4</td></tr><tr><td>Hot Hydrogen Attack</td><td>5</td></tr><tr><td>Hydrogen Embrittlement</td><td>1</td></tr></table>

Field Caption	Field ID	Data Type (Length)	Comments

Degradation Mechanism	Ranking
Hydrogen Embrittlement	2
Hydrogen Embrittlement	3
Hydrogen Embrittlement	4
Hydrogen Embrittlement	5
Hydrogen Induced Cracking	1
Hydrogen Induced Cracking	2
Hydrogen Induced Cracking	3
Hydrogen Induced Cracking	4
Hydrogen Induced Cracking	5
Liquid Metal Embrittlement	1
Liquid Metal Embrittlement	2
Liquid Metal Embrittlement	3

Field Caption	Field ID	Data Type (Length)	Comments

Degradation Mechanism	Ranking
Liquid Metal Embrittlement	4
Liquid Metal Embrittlement	5
Mechanical Fatigue	1
Mechanical Fatigue	2
Mechanical Fatigue	3
Mechanical Fatigue	4
Mechanical Fatigue	5
Phase Change Embrittlement	1
Phase Change Embrittlement	2
Phase Change Embrittlement	3
Phase Change Embrittlement	4
Phase Change Embrittlement	5
Temper Embrittlement	1
Temper Embrittlement	2
Temper Embrittlement	3
Temper Embrittlement	4

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Degradation Mechanism</th><th>Ranking</th></tr>
<tr><td>Temper Embrittlement</td><td>5</td></tr>
<tr><td>Thermal Fatigue</td><td>1</td></tr>
<tr><td>Thermal Fatigue</td><td>2</td></tr>
<tr><td>Thermal Fatigue</td><td>3</td></tr>
<tr><td>Thermal Fatigue</td><td>4</td></tr>
<tr><td>Thermal Fatigue</td><td>5</td></tr>
<tr><td>Wet H2S Damage</td><td>1</td></tr>
<tr><td>Wet H2S Damage</td><td>2</td></tr>
<tr><td>Wet H2S Damage</td><td>3</td></tr>
<tr><td>Wet H2S Damage</td><td>4</td></tr>
<tr><td>Wet H2S Damage</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>Damage Comments</td><td>MI_RBDEMEEV_DAM_COM_T</td><td>Text</td><td>None</td></tr>
</table>

Degradation_Mechanism Worksheet

On the Degradation_Mechanism worksheet, you will specify related Degradation Mechanisms that you want to create and link to RBI Criticality Analysis records.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required.
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.
Analysis Unique ID	MI_ANALYSIS_ID	N/A	The value in this cell must correspond to a value entered in the Analysis Unique ID column on the RBI_Criticality_Analysis worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	The value in this cell must be a Degradation Mechanism that corresponds to a Criticality Other Damage Mech. Eval. record. The value in this cell is used to create the Degradation Mechanism for the Degradation Mechanism Evaluation that will be linked to the analysis, as well as the corresponding Potential Degradation Mechanism that will be related to the component. In the baseline GE Digital APM system, this cell may only contain one of the following values: • Amine Cracking (ASCC) • Carbonate Cracking • Caustic Cracking • Chloride Stress Corrosion Cracking (Cl SCC) • Hydrogen Stress Cracking (HSC)- Hydrofluoric Acid • Polythionic Acid SCC (PTA) • Sulfide Stress Cracking (SSC) • Wet H2S (Blistering, SOHIC, HIC, SSC) • Criticality Calculator External Corrosion • Criticality Calculator Internal Corrosion • 885 Embrittlement • Brittle Fracture • Carburization • Creep • Erosion • Ext Chloride SCC

Field Caption	Field ID	Data Type (Length)	Comments
			• Graphitization • Hot Hydrogen Attack • Hydrogen Embrittlement • Hydrogen Induced Cracking • Liquid Metal Embrittlement • Mechanical Fatigue • Microbiologically Induced Corrosion • Phase Change Embrittlement • Refractory Failure • Temper Embrittlement • Thermal Fatigue • Wet H2S Damage
Deg Mech Comments	MI_DEGR_MECH_DEG_MECH_COMM_TX	Text	None

About the Risk Based Inspection (RBI) 580 Data Loader Load Verification

Following a data load, you should perform the following steps in GE Digital APM to confirm the integrity and accuracy of the data imported from the data loader workbook:

- Access the details of the import job. These details will indicate if any errors, minor or otherwise, were encountered during the import job. The log may help account for any records that are unexpectedly absent after the data load.
- In Risk Based Inspection or Record Manager, access the assets specified in the data loader workbook, and then verify that the expected components are present or updated, and that any associated records that you expected to be created are also present in the database.

  You can enter the following query in the **SQL** workspace of the **Query** page to review a list of components created after a specified date:

  SELECT [MI_CCRBICOM].LAST_UPDT_DT "LAST_UPDT_DT", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_C] "Component", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_TYPE_C] "Component Type", [MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] "Equipment", [MI_CCRBICOM].ENTY_ID "ENTY_ID" FROM [MI_CCRBICOM] WHERE [MI_CCRBICOM].LAST_UPDT_DT >= CONVERT(VARCHAR(255), (? :d :caption='Enter a Date'), 110) ORDER BY [MI_CCRBICOM].LAST_UPDT_DT Desc,[MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] Asc

  You can enter the following query in the **Oracle** workspace of the **Query** page to review a list of components created after a specified date:

  SELECT [MI_CCRBICOM].LAST_UPDT_DT "LAST_UPDT_DT", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_C] "Component", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_TYPE_C] "Component Type", [MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] "Equipment", [MI_CCRBICOM].ENTY_ID "ENTY_ID" FROM [MI_CCRBICOM] WHERE [MI_CCRBICOM].LAST_UPDT_DT >= to_date(to_char((? :d :caption='Enter a Date'),'mm/dd/yyyy'),'mm/dd/yyyy') ORDER BY [MI_CCRBICOM].LAST_UPDT_DT Desc,[MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] Asc

  When prompted, enter the date on which the data load was performed.

About the Risk Based Inspection (RBI) 581 Data Loader

Using the Risk Based Inspection (RBI) 581 Data Loader, you can implement Risk Based Inspection when you have RBI data in a legacy system, which is not supported by GE Digital APM. To import data using the Risk Based Inspection (RBI) 581 Data Loader, GE Digital APM provides an Excel template, **RBI_581_Data_Loader.xlsx**, which supports baseline Risk Based Inspection GE Digital APM. You must export your legacy system so that the data can be used to populate the template. The data from the template will then be imported into GE Digital APM using the Risk Based Inspection (RBI) 581 Data Loader.

Note: The Excel template is referred to throughout this documentation as the *data loader workbook*.

The data loader workbook can be used in the following scenarios:

- Create or update components
- Create analyses
- Loading components and risk analysis data into GE Digital APM so that you can retain visibility into the analysis details and calculations, and generate recommendations.
- Calculate risk, probability and consequence of failure, and then utilize the Inspection Planning feature to mitigate the risk by the plan date.

After importing the data, the Risk Based Inspection (RBI) 581 Data Loader creates the following records in GE Digital APM:

- Criticality Calculator RBI Component
- RBI 581 Risk Analysis
- RBI Consequence Evaluation
- RBI 581 Thinning and Lining Evaluation
- RBI 581 External Damage Evaluation
- RBI 581 External Cracking Damage Evaluation
- RBI 581 Cracking Damage Evaluation
- RBI 581 HTHA Damage Evaluation
- RBI 581 Brittle Fracture Damage Evaluation

You cannot, however, create RBI 581 Mechanical Fatigue Damage Evaluation records using the Risk Based Inspection (RBI) 581 Data Loader.

The data on the (Picklist) worksheet is not loaded when you load data using the Risk Based Inspection (RBI) 581 Data Loader.

Note: This data loader workbook is not backward compatible to earlier versions of GE Digital APM.

About the Risk Based Inspection (RBI) 581 Data Loader Requirements

Before you use the Risk Based Inspection (RBI) 581 Data Loader, you must complete the following steps:

- Ensure that the RBI 581 module is deployed.
- Ensure that the following data is present:
  - Site Reference
  - Equipment Taxonomy
  - Equipment and Functional Location Families
  - RBI Data Mapping
  - Units of Measure Conversion Sets
  - Stress Tables (GE Digital provides Stress Tables for Pressure Vessels and Tanks. If you want to use values from these Stress Tables with the data load, you must ensure that the records are imported into your database prior to performing the data load. GE Digital does not provide Piping Stress Tables).

    Representative Fluids
- If you have added custom fields to Risk Mapping families (e.g., RBI Risk Matrix Mapping, Risk Analysis Mapping), you must ensure that mappings exist for those fields, or data may not be populated as expected after the data load. This is because the Risk Based Inspection (RBI) 581 Data Loader relies on Risk Mapping families to ensure that fields on RBI 581 Risk Analysis and related records are correctly populated with data, and that resulting risk values can be mapped to the Default Risk Matrix.
- The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI RBI Analyst Security Group or a Security Role that is associated with this Security Group.
- The data loader workbook contains sample data in each column. It is only for your reference. You must remove this data before using the data loader workbook.

About the Risk Based Inspection (RBI) 581 Data Loader Data Model

This content has been intentionally excluded from the GE Digital APM product documentation website. This content is available to you via the product documentation that is provided within the GE Digital APM system.

About the Risk Based Inspection (RBI) 581 Data Loader General Loading Strategy

The imported data must load in a specific sequence in order to successfully populate fields, to create records, and to link them to the predecessor and/or successor records.

Best Practices

When importing data using the Risk Based Inspection (RBI) 581 Data Loader, you must use the following best practices:

- ID fields must not include special characters or spaces.
- Columns (including columns representing custom fields) in the worksheets should be formatted as Text.
- Import a maximum of 500 assets in each data load.
- Do not try to create and update a component in the same data loader workbook.
- Ensure that you enter values in cells that correspond to fields required to calculate an analysis. Otherwise, the analysis and related records are not created or updated after you load data.
- When a field whose value is required based on the value in another field is blank:
    - If you are using the dataloader to create the analysis, the RBI Analysis and related records will not be created.
    - If you are using the dataloader to update the analysis, the fields for which data exists are updated in the database. However, an error is logged in the log file of the import job.
- You must consider the rules described in the Workbook Layout and Use section of this document while using the Risk Based Inspection (RBI) 581 Data Loader.
- If you have entered data related to an analysis or a DME, then you must always enter data of the associated component in the RBI_Component worksheet, even if the corresponding Criticality Calculator RBI Component record exists in the GE Digital APM database.
- You must enter a valid value in the following cells in the RBI_Component work-sheet; Otherwise, the row that corresponds to that component is skipped:
    - Component ID
    - Component Type
    - Process Fluid
    - GFF Component Type
- When you use the data loader to *create* an analysis and a cell that requires a Boolean value is blank, the corresponding field in GE Digital APM is updated with the value *False*. When you use the data loader to *update* an analysis and a cell that requires a Boolean value is blank, the corresponding field in GE Digital APM is *not*

updated. Therefore, to avoid ambiguity, we recommend that you enter the value*True* or *False* in the cell and not leave it blank.

- If you want to override the default values that you have specified in the **RBI 581 Admin Options** workspace, you can include those values in the Risk Based Inspection (RBI) 581 Data Loader. For example, if the value for the Atmospheric Condition field for an RBI 581 External Damage Evaluation record is set to *Temperate* in the **RBI 581 Admin Options** workspace. You can override this value by entering a different value in the Atmospheric Condition cell in the DME_ExternalDamage worksheet.
- If you want to override values that are populated from the associated component, you can include those values in the Risk Based Inspection (RBI) 581 Data Loader. For example, the value for the Operating Temperature field in an RBI 581 Risk Analysis is populated from the corresponding field in the associated RBI Component. If you want to override this value for the analysis, you must include a column for Operating Temperature in the RBI_581_Analysis worksheet in the data loader workbook, and enter the value in that cell.
- In addition to the fields included in the Risk Based Inspection (RBI) 581 Data Loader, if you want to add values for more fields for a record, you can add columns for those fields in the appropriate worksheet.

  Note: The fields that you want to add to the data loader workbook must already exist in the corresponding family. If not, you must add the fields to the family via Configuration Manager.

- You should not add columns that correspond to fields in the **Outputs** and **Intermediate Outputs** sections of a datasheet; Otherwise, the calculations might not be correct.
- You should not add a column that corresponds to the Use Combined Confidence and Use Related Inspection fields to any of the following worksheets:
  - DME_Thinning
  - DME_ExternalCracking
  - DME_Cracking

  The Use Combined Confidence field is part of the integration of the Risk Based Inspection and Inspection Management modules. A value should only be set in GE Digital APM.

Load Sequence

The data is loaded in the following sequence in order to create all necessary relationships between records:

1. The Assets worksheet is processed. The Data Loader searches for the asset that corresponds to the Equipment ID, CMMS System, and Equipment Technical Number information that you provide in the Assets worksheet.

If an asset specified on the worksheet does not exist, it will be skipped, as well as all entries in the subsequent worksheets corresponding to that asset.

2. The RBI_Component worksheet is processed. The Data Loader searches for the RBI Component based on the asset data and the values in the Component and Component Type cells.

   If a component exists in the GE Digital APM database, it will be updated. If not, a new component will be created, and linked to the asset.

3. The RBI 581 Analysis worksheet is processed. For each row based on the cells specified in steps 1 and 2, a new analysis is created and linked to that component. You cannot update an analysis using the data loader workbook. The value in the Analysis Unique ID cell is not stored but will be used to identify all the Degradation Mechanism Evaluations and Consequence Evaluations specified on the subsequent worksheets that should be linked to the analysis.

   If there is invalid data for calculating an analysis, the row that corresponds to that analysis is skipped. All the Consequence Evaluations and DMEs linked to that analysis are also skipped.

4. The RBI 581 Consequence worksheet is processed. For each row based on the cells specified in steps 1 to 3, a Consequence Evaluation is created, and linked to the specified analysis.

5. The worksheets representing Degradation Mechanism Evaluations are processed. For each row based on the cells specified in steps 1 to 3, a Degradation Mechanism Evaluation is created, and linked to the specified analysis. Additionally, for each Damage Mechanism, a corresponding Potential Degradation Mechanism is created, and linked to the component, unless a Potential Degradation Mechanism of the same type is already linked to the same component.

   When the Degradation Mechanism Evaluations are processed, if you have not included a Degradation Mechanism in the worksheet that corresponds to an existing Potential Degradation Mechanism on the component, that Potential Degradation Mechanism will be unlinked.

Data that you specify in the cells on each worksheet will be included in the records. Additionally, fields in the records will be populated with data based on your RBI Data Mapping. For example, an RBI 581 Risk Analysis will be populated with data from the RBI Component to which it is linked the same way it happens if you create the same records in GE Digital APM.

About the Risk Based Inspection (RBI) 581 Data Loader Workbook Layout and Use

To import data using the Risk Based Inspection (RBI) 581 Data Loader, GE Digital APM provides an Excel workbook, **RBI_581_Data_Loader.xlsx**, which supports baseline Risk Based Inspection in GE Digital APM. This workbook must be used to perform the data load. You can modify the Excel workbook to include custom fields used by your organization.

Note: The Excel workbook is referred to throughout this documentation as the *data loader workbook*.

The following table lists the worksheets that are included in the data loader workbook.

Worksheet	Description
Assets	This worksheet is used to specify existing Equipment records to which components will be linked.
RBI_Component	This worksheet is used to specify the following types of RBI Component records that will be updated or created and linked to assets. • Cylindrical Shell • Exchanger Header • Exchanger Tube • Piping • Pump Compressor Casing • Tank Bottom
RBI_581_Analysis	This worksheet is used to specify RBI 581 Risk Analysis records that will be created and linked to components. You cannot update an RBI 581 Risk Analysis using the data loader workbook.
RBI_581_Consequence	This worksheet is used to specify RBI 581 Consequence Evaluation records that will be created and linked to analyses. Each analysis can be linked to only *one* RBI 581 Consequence Evaluation.

Worksheet	Description
DME_Lining	This worksheet is used to specify the 581-Internal Component Lining Damage DMs (which are or will be represented by the RBI 581 Thinning and Lining Evaluation records) that you want to create or update. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the value in the Lining Present column is *True* in the RBI_Component worksheet for the associated component.
DME_AST	This worksheet is used to specify the 581-Atmospheric Tank Bottom Corrosion DMs (which are or will be represented by the RBI 581 Thinning and Lining Evaluation records) that you want to create or update. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if: • The component tamily is Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet for the associated component is *MI_CCRBICTB*). • The value in the Is Intrusive column in the RBI_Component worksheet for the associated component is *True*.
DME_Thinning	This worksheet is used to specify the following DMs that you want to create or update: • 581-High Temperature Oxidation • 581-Cooling Water Corrosion • 581-High Temperature H2/H2S Corrosion • 581-Amine Corrosion • 581-Hydrofluoric Acid Corrosion • 581-Sulfuric Acid Corrosion • 581-Hydrochloric Acid Corrosion • 581-Acid Sour Water Corrosion • 581-High Temperature Sulfidic and Naphthenic Acid • 581-Alkaline Sour Water Corrosion • 581-Soil Side Corrosion 581-Thinning Damage These DMs belong to the RBI 581 Thinning and Lining Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis.

Worksheet	Description
DME_Extern-alDamage	This worksheet is used to define the following DMs that you want to create or update: • 581-Ferritic Component Atmospheric Corrosion • 581-Ferritic Component Corrosion Under Insulation These DMs belong to the RBI 581 External Damage Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the component type is *not* Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is not *MI_CCRBICTB*).
DME_Extern-alCracking	This worksheet is used to define the following DMs that you want to create or update: • 581-Austenitic Component Cracking Under Insulation • 581-Austenitic Component Atmospheric Cracking These DMs belong to the RBI 581 External Cracking Damage Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the component type is *not* Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is not *MI_CCRBICTB*).
DME_Cracking	This worksheet is used to specify the following DMs that you want to create or update: • 581-Amine Cracking • 581-Alkaline Carbonate Stress Corrosion Cracking • 581-HIC/SOHIC - HF • 581-HIC/SOHIC - H2S • 581-Caustic Cracking • 581-Hydrogen Stress Cracking • 581-Other Cracking • 581-Sulfide Stress Cracking • 581-Chloride Stress Corrosion Cracking • 581-Polythionic Acid Cracking These DMs belong to the RBI 581 Cracking Damage Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis.

Worksheet	Description
DME_HTHA	This worksheet is used to specify the 581-High Temperature Hydrogen Attack DMs (which are or will be represented by the RBI 581 HTHA Damage Evaluation records) that you want to create or update. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the component type is *not* Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is not *MI_CCRBICTB*).
DME_BrittleFracture	This worksheet is used to specify the following DMs (which are or will be represented by the RBI 581 Brittle Fracture Damage Evaluation records) that you want to create or update. • 581-Sigma Phase Embrittlement • 581-885F Embrittlement • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the component type is *not* Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is not *MI_CCRBICTB*).
(Picklist)	This worksheet contains a list of valid values that you can enter in each column (as applicable) in the aforementioned worksheets. When you load data using the data loader, the data on this worksheet is *not* loaded. The values in the some of the columns are filtered based on the values in other fields. For example, the values in the following columns are filtered based on the values in the Stress Lookup Table column: • BM Code • BM Year • BM Spec • BM Grade Also, if you select a value in the BM Code column, the values in the BM Year, BM Spec, and BM Grade columns are filtered accordingly.

⚠**IMPORTANT:** The Risk Based Inspection (RBI) 581 Data Loader overrides the default values specified in the **RBI 581 Admin Options** workspace.

Color Coding

Certain columns on the worksheets have different functions and requirements. To illustrate this, certain columns are color-coded. The following table lists the colors and what they represent.

Color	Description	Comments
	Required Key Fields	Indicates columns that contain values that are used by the Risk Based Inspection (RBI) 580 Data Loader to look up and create records. If these columns are removed from the worksheets, the data load will fail. While the worksheets require that these columns be present, values are not necessarily required in these columns.
	Fields Required for Calculation	Indicates columns that contain values that are required to perform calculations in Risk Based Inspection. Some cells only require values in certain cases. Such cases are found in parentheses in the first row of each worksheet.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for Risk Based Inspection, should contain values.
	Custom Fields	Indicates columns where you can specify custom fields.

Limitations

The Risk Based Inspection (RBI) 581 Data Loader has the following limitations:

- You must use the data loader workbook. If you modify the format of the values in columns in any of the worksheets, you will not be able to import data.
- Components of the Heat Exchanger - Bundle type are not supported as part of the baseline GE Digital APM, but you can enter data related to the component.
- The values that you enter in the data loader workbook are case-sensitive.
- You cannot import data related to a custom DME using the Risk Based Inspection (RBI) 581 Data Loader. You must import only those DMEs that are included in the data loader workbook.
- If you reimport data, the records that have been created by the Data Loader will be *updated*. Therefore, while reimporting data, if you remove the data for a field in the data loader workbook, the value for the corresponding field in GE Digital APM will be blank.
- You *cannot* create Inventory Group Configuration records, or link a Component to an inventory group using the data loader workbook.
- When you use the data loader to update an RBI 581 Analysis and the associated Consequence Evaluation, Damage Mechanisms, and Damage Mechanism Evaluations:
    - If a cell contains data, the value in the corresponding field will be updated in the database.

- If a cell is blank, the value in the corresponding field will *not be updated* with a blank value in the database. The value that previously existed in the field is retained.

- You cannot delete the Consequence Evaluation and the Degradation Mechanism Evaluations associated with an RBI Analysis using the data loader.
- You cannot update a What-If analysis using the data loader.

Assets Worksheet

In the Assets worksheet, you will specify assets to which you want to link components. The columns that appear on this worksheet also appear on every subsequent worksheet, and are used to identify the records that will be linked, directly or indirectly, to the assets. The combination of values in the three columns on this worksheet must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment record for an asset has a value in the CMMS System field, enter that value in this column.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.

RBI_Component Worksheet

In the RBI_Component worksheet, you will specify the components (which are or will be represented by RBI Component records) that you want to create or update.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP00-0_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP00-0_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP00-0_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMP-O_COMPO_C	Character (250)	A value is required and must be unique. This value identifies the component.

Field Caption	Field ID	Data Type (Length)	Comments
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required. This cell may only contain one of the following values, which exist in the list in the Component Type field for RBI Component records: • 1" Pipe • 1.25" Pipe • 1.5" Pipe • 1/2" Pipe • 10" Pipe • 102" Pipe • 12" Pipe • 14" Pipe • 16" Pipe • 18" Pipe • 2" Pipe • 2.5" Pipe • 20" Pipe • 24" Pipe • 26" Pipe • 28" Pipe • 3" Pipe • 3/4" Pipe • 30" Pipe • 32" Pipe • 34" Pipe • 36" Pipe

Field Caption	Field ID	Data Type (Leng-th)	Comments
			• 4" Pipe • 40" Pipe • 42" Pipe • 48" Pipe • 5" Pipe • 54" Pipe • 56" Pipe • 6" Pipe • 60" Pipe • 8" Pipe • 90" Pipe • Air Cooled Exchanger-Header • Air Cooled Exchanger-Tbs • Balanced Bellows PRD • Column-Bottom • Column-Middle • Column-Tank Bottom • Column-Top • Compressor • Conventional PRD • Filter • Fin/Fan Cooler • Heat Exchanger Tubes • Heat Exchanger-Bundle • Heat Exchanger-Chan • Heat Exchanger-Channel

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>Heat Exchanger-Shell
Heat Exchanger-Tubes
Pilot-Operated PRD
PRD with Rupture Disk
Pressure Vessel
Pump
Reactor
Rupture Disk Only
Storage Tank
Storage Tank Bottom</td></tr>
<tr><td>Component Family</td><td>FAMILY_ID</td><td>Character (50)</td><td>A value is required.
This cell may only contain one of the following values:<table><tr><th>Value</th><th>Component Family</th></tr><tr><td>MI_CCRBICCS</td><td>Cylindrical Shell</td></tr><tr><td>MI_CCRBICEH</td><td>Exchanger Header</td></tr><tr><td>MI_CCRBICET</td><td>Exchanger Tube</td></tr><tr><td>MI_CCRBICPI</td><td>Piping</td></tr><tr><td>MI_CCRBIPCC</td><td>Pump Compressor Casing</td></tr><tr><td>MI_CCRBICTB</td><td>Tank Bottom</td></tr></table></td></tr>
<tr><td>Component Description</td><td>MI_RBICOMP-O_COMPO_DESCR_C</td><td>Character (255)</td><td>None</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Component Start Date	MI_RBI COMPO_COMP_STRT_DATE_DT	Date	A value is required. Enter the value in the following format: YYYY-MM-DD hh:mm:ss
Circuit From	MI_CCRBICP-I_CIRCU_FROM_C	Character (250)	This value is applicable only if the component type is piping (i.e., the value in the Component Family cell is *MI_CCRBICPI*).
Circuit To	MI_CCRBICP-I_CIRCU_TO_C	Character (250)	This value is applicable only if the component type is piping (i.e., the value in the Component Family cell is *MI_CCRBICPI*).
Component Comments	MI_RBICOMP-O_COMPO_COMME_TX	Text	None
Operating Pressure	MI_RBICOMP-O_OPERA_PRESS_N	Numeric	A value is required. The value in this cell is copied to the Operating Pressure field of the associated RBI Analysis. The value in this cell must be less than or equal to the value in the Design Pressure cell.
Operating Temperature	MI_RBICOMP-O_OPERA_TEMPE_N	Numeric	A value is required. The value in this cell is copied to the Operating Temperature field of the associated RBI Analysis. The value in this cell must be less than or equal to the value in the Design Temperature cell.

Field Caption	Field ID	Data Type (Length)	Comments
Foundation Type	MI_CCRBICTB_FOUND_TYPE_C	Character (50)	A value is required if the value in the Component Type cell is *Storage Tank Bottom*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Clay • Silt • Sand • Gravel • Concrete • Double Floor The list in this field is populated by the FOUNDATION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Initial Fluid Phase	MI_RBICOMPO_INIT_FLU_PHASE_C	Character (20)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Liquid • Gas The list in this field is populated by the FLUID TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Process Fluid	MI_RBICOMP-O_PROCE_FLUID_C	Character (50)	A value is required. This cell may only contain a value that exists in the list in the Process Fluid field for RBI Component records. If you enter a value that is not valid for RBI 581, the Data Loader will skip that row. If the value in the Component Type is *Storage Tank Bottom*, then this cell may only contain one of the following values: • C6-C8 • C9-C12 • C13-16 (Diesel) • C17-25 (Gas Oil) • C25+ (Resid)
Toxic Mixture	MI_RBICOMP-O_TOXIC_MIX_F	Boolean	Enter *True* or *False*.
Toxic Fluid	MI_RBICOMP-O_TOXIC_MODEL_C	Character (50)	A value is required if the value in the Toxic Mixture cell is *True*. This cell may only contain a value that exists in the list in the Toxic Fluid field for RBI Component records.
Percent Toxic	MI_RBICOMP-O_PERCE_TOXIC_N	Numeric	A value is required if the value in the Toxic Mixture cell is *True*.

Field Caption	Field ID	Data Type (Length)	Comments
Inventory	MI_RBICOMP-O_INVEN_N	Numeric	A value is required if component type is *not* Tank Bottom (i.e., the value in the Component Family cell is not *MI_CCRBICTB*).
Inventory Group	MI_RBICOMP-O_INVEN_GROUP_C	Character (50)	You *cannot* use this column to link the Component to an inventory group. You can link a component to an inventory group *only* by accessing the **MI Admin Preferences** page in GE Digital APM. If the Component is already linked to an inventory group, you can override the value in the Inventory Group field by entering a value in this column. However, the calculated value in the Inventory Group Mass field remains as is.
Design Pressure	MI_RBICOMP-O_DESIG_PRESS_N	Numeric	A value is required if the component is linked to the following Potential Degradation Mechanisms (PDMs): • RBI 581 Thinning and Lining Evaluation • RBI 581 External Damage Evaluation The value in this cell is copied to the Design Pressure field of the associated RBI Analysis. The value in this cell must be greater than or equal to the value in the Operating Pressure cell.
Design Temperature	MI_RBICOMP-O_DESIG_TEMPE_N	Numeric	A value is required if the component is linked to a PDM that belongs to the following DMEs: • RBI 581 Thinning and Lining Evaluation • RBI 581 External Damage Evaluation The value in this cell is copied to the Design Temperature field of the associated RBI Analysis. The value in this cell must be greater than or equal to the value in the Operating Temperature cell.

Field Caption	Field ID	Data Type (Length)	Comments
Diameter	MI_RBICOMP-O_DIAME_INNER_N	Numeric	A value is required.
Length	MI_RBICOMP-O_LENGT_N	Numeric	A value is required if you want to calculate inventory.
Fill Height	MI_CCRBICT-B_FILL_HEIGH_N	Numeric	A value is required if the value in the Component Type cell is *Storage Tank Bottom* or *Storage Tank*.
Nominal Thickness	MI_RBICOMP-O_NOMIN_THICK_N	Numeric	A value is required if the component is linked to an analysis that is linked to the following damage mechanisms (DMs): • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement • All DMs that belong to RBI 581 Thinning and Lining Evaluation • All DMs that belong to RBI 581 External Damage Evaluation

Field Caption	Field ID	Data Type (Length)	Comments
Stress Lookup Table	MI_RBICOMP-O_STRESS_TABLE_C	Character (50)	A value is required if the component is linked to an analysis that is linked to the following damage mechanisms (DMs): • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement • All DMs that belong to RBI 581 Thinning and Lining Evaluation • All DMs that belong to RBI 581 External Damage Evaluation In the baseline GE Digital APM system, this cell may only contain one of the following values: • Pressure Vessels • Tanks • Piping If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Stress Lookup Table field for RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments
BM CODE	MI_RBICOMP-O_BM_CODE_C	Character (30)	A value is required if the component is linked to an analysis that is linked to the following damage mechanisms (DMs): • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement • All DMs that belong to RBI 581 Thinning and Lining Evaluation • All DMs that belong to RBI 581 External Damage Evaluation Refer to the (Picklist) worksheet in the excel workbook for valid values that you can enter in this cell.
BM YEAR	MI_RBICOMP-O_BM_YEAR_C	Character (50)	A value is required if the component is linked to an analysis that is linked to the following damage mechanisms (DMs): • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement • All DMs that belong to RBI 581 Thinning and Lining Evaluation • All DMs that belong to RBI 581 External Damage Evaluation Refer to the (Picklist) worksheet in the excel workbook for valid values that you can enter in this cell.

Field Caption	Field ID	Data Type (Length)	Comments
BM SPEC	MI_RBICOMP-O_BM_SPEC_C	Character (50)	A value is required if the component is linked to an analysis that is linked to the following damage mechanisms (DMs): • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement • All DMs that belong to RBI 581 Thinning and Lining Evaluation • All DMs that belong to RBI 581 External Damage Evaluation Refer to the (Picklist) worksheet in the excel workbook for valid values that you can enter in this cell.
BM GRADE	MI_RBICOMP-O_BM_GRADE_C	Character (50)	A value is required if the component is linked to an analysis that is linked to the following damage mechanisms (DMs): • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement • All DMs that belong to RBI 581 Thinning and Lining Evaluation • All DMs that belong to RBI 581 External Damage Evaluation

Field Caption	Field ID	Data Type (Length)	Comments
Weld Joint Effy	MI_RBICOMP-O_WELD_JOINT_EFFY_N	Numeric	A value is required if the component is linked to a PDM that belongs to the following DMEs: • RBI 581 Thinning and Lining Evaluation • RBI 581 External Damage Evaluation In the baseline GE Digital APM, this cell may only contain one of the following values: • 0.35 • 0.4 • 0.45 • 0.5 • 0.55 • 0.6 • 0.65 • 0.7 • 0.75 • 0.8 • 0.85 • 0.9 • 0.95 • 1 If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Weld Joint Efficiency field for RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments
Insulated?	MI_RBICOMP-O_INSUL_F	Boolean	Enter *True* or *False*. The value in this cell must be *True* if the an analysis in the component is linked to one of the following DMs: • 581-Ferritic Component Corrosion Under Insulation • 581-Austenitic Component Cracking Under Insulation
Insulation Type	MI_RBICOMP-O_INSUL_C	Character (200)	A value is required if the value in the Insulated? cell is *True*. This cell may only contain one of the following values, which exist in the list in the Insulation Type field for RBI Component records: • Asbestos • Calcium Silicate (Cl Free) • Calcium Silicate (Not Cl Free) • Foam/Cellular Glass • Mineral Wool/Fiber Glass • Pearlite • Unknown If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Insulation Type field for RBI Component records.
Injection Point Data	MI_CCRBICP-I_INJ_PT_CIR_C	Character (50)	A value is required if the component type is Piping (i.e., the value in the Component Family cell is *CCRBICPI*).

Field Caption	Field ID	Data Type (Length)	Comments
Piping Circuit Length	MI_CCRBICP-I_PIP_CIR_LENG_N	Numeric	A value is required if: • The component type is Piping (i.e., the value in the Component Family cell is *MI_CCRBICPI*). -and- • The value in the Use Calculate Inventory cell in the RBI_581_Consequence worksheet is *True*.
PWHT	MI_RBICOMP-O_PWHT_F	Boolean	Enter *True* or *False*.
Internal Corrosion Type	MI_RBICOMP-O_INTER_CORR_TYPE_C	Character (50)	A value is required if component is linked to RBI 581 Thinning and Lining Evaluation. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • General • Localized • Pitting The list in this field is populated by the CORROSION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in yourGE Digital APM system, via Configuration Manager, refer to the appropriate table.
Predictable Int. Corr. Location	MI_CCRBICO-M_PRED_INT_COR_LOC_F	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Estimated Internal Corrosion Rate	MI_RBICOMPO_EXP_INT_CORR_RT_N	Numeric	A value is required if: • The component is linked to the 581 Internal Component Lining Damage DM. -and- • The value in the Selected Base Material Corrosion Rate cell in the linked DM is *Estimated Rate*.
Estimated External Corrosion Rate	MI_RBICOMPO_EXP_EXT_CORR_RT_N	Numeric	A value is required if: • The component is linked to a PDM that belongs to RBI 581 External Cracking Damage Evaluation or RBI 581 External Corrosion Damage Evaluation. -and- • The value in the Selected External Corrosion Rate cell for the associated DMs is *Estimated*.
Measured External Corrosion Rate	MI_RBICOMPO_MEAS_EXT_COR_RT_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Source of Calculated Corrosion Rates	MI_CCRBICOM_CALCD_CR_SRC_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • ASSET • COMPONENT • MANUAL The list in this field is populated by the MI_RBI_CALC_CORRO_SRC System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Percent Liquid Volume	MI_RBICOMPO_PER_LIQ_VOL_N	Numeric	A value is required if you want to calculate inventory.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Detection System</td><td>MI_CCRBICOM_DETECTION_SYSTEM_C</td><td>Character (4)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Detection System</th></tr><tr><td>A</td><td>Loss Of Pressure Or Flow</td></tr><tr><td>B</td><td>Pressure Envelope</td></tr><tr><td>C</td><td>Visual Detection</td></tr></table>
The list in this field is populated by the 581_Detection System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Isolation System</td><td>MI_CCRBICOM_ISOLA_SYSTE_CHR</td><td>Character (50)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Isolation System</th></tr><tr><td>A</td><td>Auto Shutdown</td></tr><tr><td>B</td><td>Leakage Shutdown (This value is valid only if the value in the Detection System cell is B or C).</td></tr><tr><td>C</td><td>Manual Shutdown (This value is valid only if the value in the Detection System cell is C).</td></tr></table>
The list in this field is populated by the 581_Isolation System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Mitigation System</td><td>MI_CCRBICOM_MITIGATION_SYSTM_C</td><td>Character (60)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Mitigation System</th></tr><tr><td>1</td><td>Inventory blowdown</td></tr><tr><td>2</td><td>Fire water deluge system</td></tr><tr><td>3</td><td>Fire water monitors only</td></tr><tr><td>4</td><td>Foam spray system</td></tr><tr><td>5</td><td>No mitigation system</td></tr></table>
The list in this field is populated by the 581_Mitigation_System System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Fluid Velocity</td><td>MI_CCRBICOM_FLUID_VELOCITY_N</td><td>Numeric</td><td>A value is required if an analysis in the component is linked to any of the following DMs:
581-Acid Sour Water Corrosion
581-Hydrofluoric Acid Corrosion
581-Amine Corrosion
581-Cooling Water Corrosion
581-High Temperature Sulfidic and Naphthenic Acid
581-Sulfuric Acid Corrosion
581-Alkaline Sour Water Corrosion</td></tr>
</table>

Field Caption	Field ID	Data Type (Leng-th)	Comments
pH of Water	MI_CCRBICO-M_PH_OF_WATER_N	Numer-ic	A value is required if an analysis in the component is linked to any of the following DMs: • 581-Acid Sour Water Corrosion • 581-Cooling Water Corrosion • 581-Hydrochloric Acid Corrosion • 581-Alkaline Carbonate Stress Corrosion Crack-ing • 581-Chloride Stress Corrosion Cracking • 581-HIC/SOHIC - H2S • 581-Sulfide Stress Cracking

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Geometry Type</td><td>MI_CCRBICOM_GEOMETRY_TYPE_C</td><td>Character (60)</td><td>A value is required if the component is linked to any of the following PDMs:
RBI 581 Thinning and Lining Evaluation
RBI 581 External Corrosion Damage Evaluation
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Geometry Type</th></tr><tr><td>CYL</td><td>Cylinder</td></tr><tr><td>SPH</td><td>Spherical Head</td></tr><tr><td>HEM</td><td>Hemispherical Head</td></tr><tr><td>PIPE</td><td>Piping</td></tr><tr><td>HEAD</td><td>Head</td></tr><tr><td>PLT</td><td>PLT (only if the value in the Component Family cell is MI_CCRBICTB)</td></tr></table>The list in this field is populated by the MI_581_Component_Geometry_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>GFF Component Type</td><td>MI_CCRBICOM_GFF_COMPO_TYPE_CHR</td><td>Character (50)</td><td>A value is required.

This cell may only contain one of the following values, which exist in the list in the GFF Component Type field for RBI Component records:

<table>
<tr><th>Value</th><th>General Fail Frequency (GFF) Component Type</th></tr>
<tr><td>COLBTM</td><td>Vessel/FinFan</td></tr>
<tr><td>COLMID</td><td>Vessel/FinFan</td></tr>
<tr><td>COLTOP</td><td>Vessel/FinFan</td></tr>
<tr><td>COMPC</td><td>Compressor</td></tr>
<tr><td>COMPR</td><td>Compressor</td></tr>
<tr><td>COURSE-1-10</td><td>Tank650 (only for an AST Shell component)</td></tr>
<tr><td>DRUM</td><td>Vessel/FinFan</td></tr>
<tr><td>FILTER</td><td>Vessel/FinFan</td></tr>
<tr><td>FINFAN</td><td>Vessel/FinFan</td></tr>
<tr><td>HEXSS</td><td>Heat Exchanger</td></tr>
<tr><td>HEXTS</td><td>Heat Exchanger</td></tr>
<tr><td>KODRUM</td><td>Vessel/FinFan</td></tr>
<tr><td>PIPE-1</td><td>Pipe</td></tr>
<tr><td>PIPE-10</td><td>Pipe</td></tr>
<tr><td>PIPE-12</td><td>Pipe</td></tr>
</table>
</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments

Value	General Fail Frequency (GFF) Component Type
PIPE-16	Pipe
PIPE-2	Pipe
PIPE-4	Pipe
PIPE-6	Pipe
PIPE-8	Pipe
PIPEGT16	Pipe
PUMP1S	Pump
PUMP2S	Pump
PUMPR	Pump
REACTOR	Vessel/FinFan
TANKBOTTOM	Tank650 (only if the value in the Component Family cell is *MI_CCRBICTB*)

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Cladding Present</td><td>MI_CCRBICOM_CLADDING_PRESENT_L</td><td>Character (50)</td><td>A value is required if an associated analysis is linked to any of the following DMs:
581-HIC/SOHIC – HF
581-Hydrogen Stress Cracking
581-Polythionic Acid Cracking
All DMs that belong to RBI 581 Thinning and Lining Evaluation
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Cladding Present</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Furnished Cladding Thickness</td><td>MI_CCRBICOM_CHR</td><td>Numeric</td><td>A value is required if the value in the Cladding Present cell is Y.</td></tr>
<tr><td>Minimum Structural Thickness</td><td>MI_CCRBICOM_MNMM_STRCTRL_THS_N</td><td>Numeric</td><td>A value is required if the component is linked to any of the following PDMs:
RBI 581 Thinning and Lining Evaluation
RBI 581 External Corrosion Damage Evaluation</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Liner Present</td><td>MI_CCRBICOM_LINER_PRESE_CHR</td><td>Character (50)</td><td>A value is required if the component is linked to the RBI 581 Thinning and Lining Evaluation PDM.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Liner Present</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

For the 581-Internal Component Lining Damage DM, the value in this cell must be Yes.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Liner Type</td><td>MI_CCRBICOM_LINER_TP_C</td><td>Character (50)</td><td>A value is required if the value in the Liner Present cell is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Liner Type</th></tr><tr><td>1</td><td>Strip Lined Alloy</td></tr><tr><td>2</td><td>Organic Coating (typically > 0.762mm / 30 mils)</td></tr><tr><td>3</td><td>Thermal Resistant Service - Castable Refractory</td></tr><tr><td>6</td><td>Severe/Abrasive Service - Castable Refractory</td></tr><tr><td>8</td><td>Glass Linings</td></tr><tr><td>10</td><td>Fiberglass</td></tr></table>
The list in this field is populated by the MI_581_Lining_Types_And_Resistance System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Has Release Prevention Barrier?</td><td>MI_CCRBICTB_HAS_RELEA_PREVE_F</td><td>Boolean</td><td>A value is required if the value in the Component Type cell is Storage Tank Bottom.

Enter True or False. If you enter True, then after you load data, the value in the Maximum Fill Height in AST field is populated with the value 0.25 feet.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
CM Corrosion Rate	MI_CCRBICOM_CM_COR_RT_C	Numeric	A value is required if: • The value in the Cladding Present cell is *Y*. • The value in the Cladding Material Corrosion Rate is *Estimated*.
Corrosion Allow	MI_RBICOMPO_CORRO_ALLOW_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Is Intrusive?	MI_RBICOMPO_IS_INTRU_CHR	Character (50)	A value is required if an analysis in the component is linked to any of the following DMs: • 581-High Temperature Oxidation • 581-Cooling Water Corrosion • 581-High Temperature H2/H2S Corrosion • 581-Amine Corrosion • 581-Hydrofluoric Acid Corrosion • 581-Sulfuric Acid Corrosion • 581-Hydrochloric Acid Corrosion • 581-Acid Sour Water Corrosion • 581-High Temperature Sulfidic and Naphthenic Acid • 581-Alkaline Sour Water Corrosion • 581-Soil Side Corrosion • 581-Thinning Damage • All DMs that belong to RBI 581 Cracking Damage Evaluation • All DMs that belong to RBI 581 External Cracking Damage Evaluation • All DMs that belong to RBI 581 External Damage Evaluation
Specified Tmin	MI_CCRBICOM_SPECIFIED_TMIN_N	Numeric	A value is required if the value in the Override Minimum Thickness cell is *True*.

Field Caption	Field ID	Data Type (Length)	Comments
Base Material	MI_CCRBICOM_BASE_MATER_C	Character (50)	A value is required if an analysis in the component is linked to any of the following DMs: • 581-HIC/SOHIC – HF (only if the value in the Cladding Present field is *No (N)*) • 581-Hydrogen Stress Cracking (only if the value in the Cladding Present field is *No (N)*) • 581-Polythionic Acid Cracking (only if the value in the Cladding Present field is *No (N)*) • 581-High Temperature Hydrogen Attack • 581-Brittle Fracture • All DMs that belong to RBI 581 Thinning and Lining Evaluation This cell may only contain one of the values that exist in the list in the Base Material field for RBI Component records.

Field Caption	Field ID	Data Type (Length)	Comments

Cladding Material	MI_CCRBICOM_CLADDING_MATERIL_C	Character (50)	A value is required if:
			• The value in the Cladding Present cell is *Y*.
			• An analysis in the component is linked to one of the following DMs:
			  • 581-High Temperature Oxidation
			  • 581-Cooling Water Corrosion
			  • 581-High Temperature H2/H2S Corrosion
			  • 581-Amine Corrosion
			  • 581-Hydrofluoric Acid Corrosion
			  • 581-Sulfuric Acid Corrosion
			  • 581-Hydrochloric Acid Corrosion
			  • 581-Acid Sour Water Corrosion
			  • 581-High Temperature Sulfidic and Naphthenic Acid
			  • 581-Alkaline Sour Water Corrosion
			  • 581-Soil Side Corrosion
			  581-Thinning Damage
			This cell may only contain one of the values that exist in the list in the Cladding Material field for RBI Component records.

Total Acid Number	MI_CCRBICOM_TOTAL_ACID_NUMBR_N	Numeric	A value is required if an analysis in the component is linked to the 581-High Temperature Sulfidic and Naphthenic Acid DM.

RBI_581_Analysis Worksheet

In the RBI_581_Analysis worksheet, you will specify the analyses (which will be

represented by RBI 581 Risk Analysis records) that you want to create. You cannot update an RBI 581 Risk Analysis using the data loader workbook.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple analyses can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple analyses can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered on the RBI_Component worksheet, if they exist. Multiple analyses can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column in the RBI_Component worksheet for the associated component.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	A value is required and must be unique. This value identifies the analysis. However, in the RBI 581 Risk Analysis records that are created by the data loader in GE Digital APM, the value in the Analysis ID field is different from the value that you enter in this cell.
Scenario ID	MI_CRITANAL_TURNAROUND_ID_C	Character (50)	None

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Coefficient Y Material</td><td>MI_581RANAL_COEFFICNT_Y_MTRL_C</td><td>Character (255)</td><td>A value is required if the component type is Piping (i.e., the value in the Component Family cell is MI_CCRBICPI).

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Coefficient Y Material</th></tr><tr><td>1</td><td>Ferritic Steels</td></tr><tr><td>2</td><td>Austenitic Steels</td></tr><tr><td>3</td><td>Other Ductile Metals</td></tr><tr><td>4</td><td>Cast Iron</td></tr></table>
The list in this field is populated by the MI_581_Coefficient_Materials System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Stress Override</td><td>MI_581RANAL_STRES_OVER_F</td><td>Boolean</td><td>Enter True or False.</td></tr>
<tr><td>Allowable Stress</td><td>MI_CRITANAL_MTL_ALLOW_STRESS_N</td><td>Numeric</td><td>A value is required if the value in the Stress Override cell is True.</td></tr>
<tr><td>Flow Stress</td><td>MI_581RANAL_FLOW_STRESS_N</td><td>Numeric</td><td>A value is required if the value in the Stress Override cell is True.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Override Minimum Required Thickness	MI_581RANAL_OVERR_MINIM_REQUI_THICK_FLG	Boolean	Enter *True* or *False*.
Course Number	MI_581RANAL_COURS_NUMBE_NBR	Numeric	A value is required if the analysis is linked to a component of type Storage Tank (i.e., the value in the Component Type cell in the RBI_Component worksheet for the associated component is *Storage Tank*).

RBI_581_Consequence Worksheet

In the RBI_581_Consequence worksheet, you will specify the consequences (which are or will be represented by RBI 581 Consequence Evaluation records) that you want to create or update. You can create only one RBI 581 Consequence Evaluation for an RBI 581 Risk Analysis.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered on the Assets worksheet. Multiple Consequence Evaluations can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple Consequence Evaluations can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered on the Assets worksheet, if they exist. Multiple Consequence Evaluations can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered on the RBI_Component worksheet, if they exist. Multiple Consequence Evaluations can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered on the RBI_581_Analysis worksheet. Each analysis can have only *one* Consequence Evaluation.
Consequence	MI_RCONEVAL_CONS_C	Character (50)	A value is required. The default value is *RBI*.

Field Caption	Field ID	Data Type (Length)	Comments
Use Calculated Inventory	MI_RBI_EVN0_USE_CAL_INV_L	Boolean	Enter *True* or *False*. If the value in this cell is *True*, values in the following cells in the RBI_Component worksheet for the associated component are required: • Length • Diameter • Piping Circuit Length
Inventory Group Mass	MI_RBI_EVN0_INV_GRP_MSS_N	Numeric	A value is required if the value in the Component Family cell is *not* Storage Tank Bottom.
Include Personnel Injury	MI_RBI_EVN0_INCLDPRSNNLNJRYG_L	Boolean	Enter *True* or *False*.
Injury Cost	MI_RCONEVAL_INJUR_COST_N	Numeric	A value is required if the value in the Include Personnel Injury cell is *True*.
Equipment Cost	MI_RCONEVAL_EQU_COST_N	Numeric	A value is required if the value in the Component Type cell is not *Storage Tank Bottom*.
Production Cost	MI_RCONEVAL_PROD_COST_N	Numeric	A value is required.
Environmental Clean-up Costs	MI_RBI_EVN0_ENVIR_CLEAN_COSTS_NBR	Numeric	A value is required if the value in the Component Type cell is *not* Storage Tank Bottom.
Allow Override of Total Financial Consequence	MI_RBI_EVN0_ALW_OVE_OF_TT_FC_FLAG	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
User Total Financial Consequences	MI_RBI_EVN0_USERTOTAL_FC_N	Numeric	A value is required if the value in the Allow Override of Total Financial Consequence cell is *True*.
Maximum Fill Height in AST	MI_RBI_EVN0_MXM_FLL_HGT_AST_N	Numeric	A value is required if, on the RBI_Component worksheet: • The value in the Component Type cell is *Storage Tank* or *Storage Tank Bottom*. • The value in the Has Release Prevention Barrier cell is *False*. If, however, the value in the Has Release Prevention Barrier cell is *True*, after you load data, the Maximum Fill Height is AST field is populated with the value *0.25 feet* irrespective of the value in this cell.
Fluid Percent Leaving Dike	MI_RBI_EVN0_FLD_PRCT_LVG_DKE_N	Numeric	A value is required if the component family is Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is *MI_CCRBICTB*).
Fluid Percent Onsite	MI_RBI_EVN0_FLUD_PRCNT_ONSTE_N	Numeric	A value is required if the component family is Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is *MI_CCRBICTB*).

Field Caption	Field ID	Data Type (Length)	Comments
Fluid Percent Offsite	MI_RBI_EVN0_FLD_PRCNT_OFFSTE_N	Numeric	A value is required if the component family is Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is *MI_CCRBICTB*).

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Environmental Sensitivity</td><td>MI_RBI_EVN0_ENVRNMNTL_SNSTVY_C</td><td>Character (50)</td><td>A value is required if the component family is Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is MI_CCRBICTB).

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Environmental Sensitivity</th></tr><tr><td>L</td><td>Low</td></tr><tr><td>M</td><td>Medium</td></tr><tr><td>H</td><td>High</td></tr></table>
The list in this field is populated by the MI_581_Environmental_Sensitivity System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Tank Course Height</td><td>MI_RBI_EVN0_TANK_COURSE_HGHT_N</td><td>Numeric</td><td>A value is required if the value in the Component Type cell is Storage Tank.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Distance from Tankbottom to Groundwater	MI_RBI_EVN0_DSE_FRM_TNM_GRR_N	Numeric	A value is required if the value in the Component Type cell is *Storage Tank Bottom*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Soil Type under Tank bottom</td><td>MI_RBI_EVN0_SL_TYE_UNR_T_BTM_C</td><td>Character (50)</td><td>A value is required if the value in the Component Type cell is Storage Tank Bottom.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Soil Type</th></tr><tr><td>CL</td><td>Clay</td></tr><tr><td>CS</td><td>Coarse Sand</td></tr><tr><td>CA</td><td>Concrete Asphalt</td></tr><tr><td>FS</td><td>Fine Sand</td></tr><tr><td>GR</td><td>Gravel</td></tr><tr><td>SC</td><td>Sandy Clay</td></tr><tr><td>SL</td><td>Slit</td></tr><tr><td>VF</td><td>Very Fine Sand</td></tr></table>
The list in this field is populated by the MI_581_Soil_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

DME_Lining Worksheet

On the DME_Lining worksheet, you will specify the 581-Atmospheric Tank Bottom Corrosion DMs (which are or will be represented by the RBI 581 Thinning and Lining Evaluation records) that you want to create or update. You can specify these records only if the value in the Liner Present cell in the RBI_Component worksheet for the associated component is *Y*.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column in the RBI_Component worksheet for the associated component.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Analysis Unique ID</td><td>MI_ANALYSIS_ID</td><td>Character (255)</td><td>Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).</td></tr>
<tr><td>Damage Mechanism</td><td>MI_RBDEMEEV_DAM_MECH_C</td><td>Character (50)</td><td>Enter 581-Internal Component Lining Damage.</td></tr>
<tr><td>Last Known Inspection Date</td><td>MI_581DMCHE_LST_KNWN_INN_DTE_D</td><td>Date</td><td>Enter a value in the following format: YYYY-MM-DD hh:mm:ss</td></tr>
<tr><td>Online Monitoring Flag</td><td>MI_581DMCHE_ONLNE_MNTRNG_FLG_C</td><td>Character (50)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Online Monitoring Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Key Process Variable?</td><td>MI_581DMCHE_KEY_PROCSS_VRBLE_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Key Process Variable</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Electrical Resistance Probes?</td><td>MI_581DMCHE_ELCTRCL_RSSE_PRS_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Electrical Resistance Probes</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Corrosion Coupons?</td><td>MI_581DMCHE_CORROSION_COUPNS_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Corrosion Coupons</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Liner Installation Date</td><td>MI_581THNL_LIN_INST_DT_D</td><td>Date</td><td>A value is required. Enter the value in the following format: YYYY-MM-DD hh:mm:ss</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Liner Condition</td><td>MI_581THNL_LINER_COND_C</td><td>Character (50)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Liner Condition</th></tr><tr><td>A</td><td>Good</td></tr><tr><td>B</td><td>Average</td></tr><tr><td>C</td><td>Poor</td></tr></table>
The list in this field is populated by the MI_581_Lining_Condition System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Immersion Grade Coating Quality</td><td>MI_581THNL_IMMN_GRE_CTG_QLY_C</td><td>Character (50)</td><td>A value is required if the liner type is organic coating (i.e., the value in the Liner Type column in the RBI_Component worksheet for the associated component is 2).

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Immersion Grade Coating Quality</th></tr><tr><td>A</td><td>High</td></tr><tr><td>B</td><td>Merdium</td></tr><tr><td>C</td><td>Low</td></tr></table>
The list in this field is populated by the MI_581_Coating_Quality System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

DME_AST Worksheet

In the DME_Lining worksheet, you will specify the 581-Atmospheric Tank Bottom Corrosion DM (which are or will be represented by the RBI 581 Thinning and Lining Evaluation records) that you want to create or update.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple components can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column in the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple Consequences can be linked to the same analysis (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	Enter *581-Atmospheric Tank Bottom Corrosion*.
Selected Base Material Corrosion Rate	MI_581THNL_SELEC_BM_COR_R_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Calculated Rate • Estimated Rate • Short Term Avg • Long Term Avg • Controlling Corrosion Rate The list in this field is populated by the 581_CORR_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Long Term Avg Corr Rate	MI_581THNL_LNG_TRM_AVG_COR_R_N	Numeric	A value is required if: • The value in the Selected Base Material Corrosion Rate column is *Long Term Avg*. -and- • The value in the Source of Calculated Corrosion Rates column in the RBI_Component worksheet for the associated component is *MANUAL*.

Field Caption	Field ID	Data Type (Length)	Comments
Short Term Avg Corr Rate	MI_581THNL_SHRT_TRM_AVG_COR_N	Numeric	A value is required if: • The value in the Selected Base Material Corrosion Rate column is *Short Term Avg*. -and- • The value in the Source of Calculated Corrosion Rates column in the RBI_Component worksheet for the associated component is *MANUAL*.
Selected Cladding Material Corrosion Rate	MI_581THNL_SELEC_CLADD_COR_R_C	Character (50)	A value is required if the value in the Cladding Present column in the RBI_Component worksheet for the associated component is *Y*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Calculated Rate • Estimated Rate • Short Term Avg • Long Term Avg • Controlling Corrosion Rate The list in this field is populated by the 581_CORR_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Thinning Type	MI_RBDEMEEV_THIN_TYPE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • General • Localized • Pitting The list in this field is populated by the CORROSION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Highest Effective Inspection Level</td><td>MI_RBDEMEEV_HIGH_EFF_INSP_C</td><td>Character (25)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Highest Effective Inspection Level</th></tr><tr><td>A</td><td>Highly Effective</td></tr><tr><td>B</td><td>Usually Effective</td></tr><tr><td>C</td><td>Fairly Effective</td></tr><tr><td>D</td><td>Poorly Effective</td></tr><tr><td>E</td><td>Ineffective (None)</td></tr></table>
The list in this field is populated by the MI_581_Inspection_Effectiveness System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Number of Highest Effective Inspections</td><td>MI_RBDEMEEV_NO_HIGH_EFF_INS_N</td><td>Numeric</td><td>A value is required, and must be between 0 and 6. If you enter 0 in this column, then the value in the Highest Effective Inspection Level column must be E.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Welded Construction Flag</td><td>MI_581DMCHE_WLDD_CNSTRCN_FLG_C</td><td>Character (50)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Welded Construction Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>API 653 Maintenance Flag</td><td>MI_581THNL_API_653_MNTE_FLG_L</td><td>Boolean</td><td>A value is required. Enter True or False.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Foundation Type	MI_581DMCHE_FOUND_TYPE_CHR	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Clay • Silt • Sand • Gravel • Concrete • Double Floor The list in this field is populated by the FOUNDATION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Settlement Adjustment Flag</td><td>MI_581DMCHE_STTLMNT_ADJT_FLG_C</td><td>Character (3)</td><td>A value is required if the value in the Foundation Type column is not Concrete.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Settlement Adjustment Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Settlement Adjustment Inspection</td><td>MI_581DMCHE_STTLMNT_ADJT_INN_C</td><td>Character (50)</td><td>A value is required if the value in the Settlement Adjustment Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Settlement Adjustment Inspection</th></tr><tr><td>1</td><td>Meets API 653</td></tr><tr><td>1.5</td><td>Never Evaluated</td></tr><tr><td>2</td><td>Exceeds API 653</td></tr></table>
The list in this field is populated by the MI_581_Recorded_Settlement_Criteria System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Online Monitoring Flag</td><td>MI_581DMCHE_ONLNE_MNTRNG_FLG_C</td><td>Character (50)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Online Monitoring Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Key Process Variable?</td><td>MI_581DMCHE_KEY_PROCSS_VRBLE_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Key Process Variable</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Electrical Resistance Probes?</td><td>MI_581DMCHE_ELCTRCL_RSSE_PRS_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Electrical Resistance Probes</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Corrosion Coupons?</td><td>MI_581DMCHE_CORROSION_COUPNS_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Corrosion Coupons</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Soil Resistivity</td><td>MI_581THNL_SOIL_RESIS_C</td><td>Numeric</td><td>A value is required if the value in the Selected Base Material Corrosion Rate cell is Calculated Rate.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
AST Pad	MI_581THNL_AST_PAD_C	Character (50)	A value is required if the value in the Selected Base Material Corrosion Rate cell is *Calculated Rate*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Soil With High Salt • Crushed Limestone • Native Soil • Construction Grade Sand • Continuous Asphalt • Continuous Concrete • Oil Sand • High Resistivity Low Chloride Sand The list in this field is populated by the 581_AST_PAD_MAT_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
AST Drainage	MI_581THNL_AST_DRAINAGE_C	Character (50)	A value is required if the value in the Selected Base Material Corrosion Rate cell is *Calculated Rate*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • One Third Frequently Under-water • Storm Water Collects At AST Base • Storm Water Does Not Collect At AST Base The list in this field is populated by the 581_AST_DRAINAGE_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Con-figuration Manager, refer to the appro-priate table.

Field Caption	Field ID	Data Type (Length)	Comments
AST Steam Coil Heater	MI_581THNL_AST_STEAM_CL_HTR_C	Character (50)	A value is required if the value in the Selected Base Material Corrosion Rate cell is *Calculated Rate*. In the baselineGE Digital APM system, this cell may only contain one of the following System Code IDs: • YES • NO The list in this field is populated by the MI_581_AST_STEAMCOIL_WATERDRWASOFF System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
AST Bottom Type	MI_581THNL_AST_BOTTOM_TYPE_C	Character (50)	A value is required if the value in the Selected Base Material Corrosion Rate cell is *Calculated Rate*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • RPB Not Per API 650 • RPB Per API 650 • Single Bottom The list in this field is populated by the 581_AST_BOTTOM_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Cathodic Protection</td><td>MI_581THNL_CATHODIC_PROTCTN_C</td><td>Character (50)</td><td>A value is required if the value in the Selected Base Material Corrosion Rate cell is Calculated Rate.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Cathodic Protection</th></tr><tr><td>None</td><td>None</td></tr><tr><td>Yes Not Per API 651</td><td>Yes and Not Per API 651</td></tr><tr><td>Yes Per API 651</td><td>Yes and Per API 651</td></tr></table>
The list in this field is populated by the 581_AST_Cathodic Protection System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Product Side Condition	MI_581THNL_PRODCT_SDE_CNDTN_C	Character (50)	A value is required if the value in the Selected Base Material Corrosion Rate cell is *Calculated Rate*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Wet • Dry The list in this field is populated by the 581_Product_Side_Condition System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Water Product Draws	MI_581THNL_WATER_PRDCT_DRWS_C	Character (50)	A value is required if the value in the Selected Base Material Corrosion Rate cell is *Calculated Rate*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • YES • NO The list in this field is populated by the MI_581_AST_STEAMCOIL_WATERDRWASOFF System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

DME_Thinning Worksheet

In the DME_Thinning worksheet, you will specify the following DMs (which are or will be represented by the RBI 581 Thinning and Lining Evaluation records) that you want to create or update.

- 581-High Temperature Oxidation
- 581-Cooling Water Corrosion
- 581-High Temperature H2/H2S Corrosion
- 581-Amine Corrosion
- 581-Hydrofluoric Acid Corrosion
- 581-Sulfuric Acid Corrosion
- 581-Hydrochloric Acid Corrosion
- 581-Acid Sour Water Corrosion
- 581-High Temperature Sulfidic and Naphthenic Acid

- 581-Alkaline Sour Water Corrosion
- 581-Soil Side Corrosion

These DMs belong to the RBI 581 Thinning and Lining Evaluation methodology. You can specify these DMs only if the value in the Component Type cell in the RBI_Component worksheet for the associated component is *not* Storage Tank Bottom.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values, which exist in the list in the Damage Mechanism field in the Potential Degradation Mechanisms record: • 581-High Temperature Oxidation • 581-Cooling Water Corrosion • 581-High Temperature H2/H2S Corrosion • 581-Amine Corrosion • 581-Hydrofluoric Acid Corrosion • 581-Sulfuric Acid Corrosion • 581-Hydrochloric Acid Corrosion • 581-Acid Sour Water Corrosion • 581-High Temperature Sulfidic and Naphthenic Acid • 581-Alkaline Sour Water Corrosion • 581-Soil Side Corrosion • 581-Thinning Damage

Field Caption	Field ID	Data Type (Length)	Comments
Governing Thinning Damage Mechanism	MI_581THNL_GOV_THIN_DMG_MECH_C	Character (50)	A value is required if the value in the Damage Mechanism column is *581-Thinning Damage*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Ammonium Bisulfide Corrosion (Alkaline Sour Water) • Cooling Water Corrosion • Dealloying • Decarburization • Erosion/Erosion-Corrosion • Flue Gas Dew Point Corrosion • Fuel Ash Corrosion • Galvanic Corrosion • Graphitic Corrosion • High Temperature H2/H2S • HCl Acid Corrosion • Ammonium Chloride Corrosion • Hydrofluoric Acid Corrosion • Oxidation • Metal Dusting • Microbioligically Induced Corrosion (MIC) • Naphthenic Acid Corrosion (NAC) • Nitriding • Phenol (Carbonic Acid) Cor-

Field Caption	Field ID	Data Type (Length)	Comments
			rosion • Phosphoric Acid Corrosion • Soil Corrosion • Sour Water Corrosion (Acidic) • Amine Corrosion • Sulfidation • Sulfuric Acid Corrosion • Other • Aqueous Organic Acid Corrosion • Boiler Water Condensate (BW/C) Corrosion • Carburization • Caustic Corrosion • Cavitation • CO2 Corrosion The list in this field is populated by the MI_581_GOV_THINNING_DAMAGE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Last Known Inspection Date	MI_581DMCHE_LST_KNWN_INN_DTE_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss

Field Caption	Field ID	Data Type (Length)	Comments
Last Known Thickness	MI_581DMCHE_LST_KNWN_THCKNSS_N	Numeric	A value is required if you entered a value in the Last Known Inspection Date cell.
Selected Base Material Corrosion Rate	MI_581THNL_SELEC_BM_COR_R_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Calculated Rate • Estimated Rate • Short Term Avg • Long Term Avg • Controlling Corrosion Rate The list in this field is populated by the 581_CORR_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Long Term Avg Corr Rate	MI_581THNL_LNG_TRM_AVG_COR_R_N	Numeric	A value is required if: • The value in the Selected Base Material Corrosion Rate column is *Long Term Avg*. -and- • The value in the Source of Calculated Corrosion Rates column in the RBI_Component worksheet for the associated component is *MANUAL*.
Short Term Avg Corr Rate	MI_581THNL_SHRT_TRM_AVG_COR_N	Numeric	A value is required if: • The value in the Selected Base Material Corrosion Rate column is *Short Term Avg*. -and- • The value in the Source of Calculated Corrosion Rates column in the RBI_Component worksheet for the associated component is *MANUAL*.

Field Caption	Field ID	Data Type (Length)	Comments
Selected Cladding Material Corrosion Rate	MI_581THNL_SELEC_CLADD_COR_R_C	Character (50)	A value is required if the value in the Cladding Present column in the RBI_Component worksheet for the associated component is *Y*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Calculated Rate • Estimated Rate • Short Term Avg • Long Term Avg • Controlling Corrosion Rate The list in this field is populated by the 581_CORR_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Number of A Level Inspections	MI_581DMCHE_NMR_OF_A_LVL_INS_N	Numeric	A value is required.
Number of B Level Inspections	MI_581DMCHE_NMR_OF_B_LVL_INS_N	Numeric	A value is required.
Number of C Level Inspections	MI_581DMCHE_NMR_OF_C_LVL_INS_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Number of D Level Inspections	MI_581DMCHE_NMR_OF_D_LVL_INS_N	Numeric	A value is required.
Thinning Type	MI_RBDEMEEV_THIN_TYPE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • General • Localized • Pitting The list in this field is populated by the CORROSION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Highest Effective Inspection Level</td><td>MI_RBDEMEEV_HIGH_EFF_INSP_C</td><td>Character (25)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Highest Effective Inspection Level</th></tr><tr><td>A</td><td>Highly Effective</td></tr><tr><td>B</td><td>Usually Effective</td></tr><tr><td>C</td><td>Fairly Effective</td></tr><tr><td>D</td><td>Poorly Effective</td></tr><tr><td>E</td><td>Ineffective (None)</td></tr></table>
The list in this field is populated by the MI_581_Inspection_Effectiveness System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Number of Highest Effective Inspections</td><td>MI_RBDEMEEV_NO_HIGH_EFF_INS_N</td><td>Numeric</td><td>Enter a value between 0 and 6. If you enter 0 in this column, then the value in the Highest Effective Inspection Level column must be E.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Injection Point Flag</td><td>MI_581DMCHE_INJECTIN_PNT_FLG_C</td><td>Character (50)</td><td>A value is required if the component type is piping (i.e., the value in the Component Family column in the RBI_Component worksheet for the associated component is MI_CCRBICPI).

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Injection Point Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Injection Point Inspection</td><td>MI_581DMCHE_INJCTN_PNT_INSPN_C</td><td>Character (50)</td><td>A value is required if the value in the Injection Point Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Injection Point Inspection</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Deadleg Flag</td><td>MI_581DMCHE_DEADLEG_FLAG_C</td><td>Character (50)</td><td>A value is required if the component type is piping (i.e., the value in the Component Family column in the RBI_Component worksheet for the associated component is MI_CCRBICPI).

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Deadleg Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Deadleg Inspection</td><td>MI_581DMCHE_DEADLEG_INSPECTN_C</td><td>Character (50)</td><td>A value is required if the value in the Deadleg Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Deadleg Inspection</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Welded Construction Flag</td><td>MI_581DMCHE_WLDD_CNSTRCN_FLG_C</td><td>Character (50)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Welded Construction Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>API 653 Maintenance Flag</td><td>MI_581THNL_API_653_MNTE_FLG_L</td><td>Boolean</td><td>Enter True or False.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Foundation Type	MI_581DMCHE_FOUND_TYPE_CHR	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Clay • Silt • Sand • Gravel • Concrete • Double Floor The list in this field is populated by the FOUNDATION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Settlement Adjustment Flag</td><td>MI_581DMCHE_STTLMNT_ADJT_FLG_C</td><td>Character (3)</td><td>A value is required if the value in the Foundation Type column is not Concrete.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Settlement Adjustment Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Settlement Adjustment Inspection</td><td>MI_581DMCHE_STTLMNT_ADJT_INN_C</td><td>Character (50)</td><td>A value is required if the value in the Settlement Adjustment Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Settlement Adjustment Inspection</th></tr><tr><td>1</td><td>Meets API 653</td></tr><tr><td>1.5</td><td>Never Evaluated</td></tr><tr><td>2</td><td>Exceeds API 653</td></tr></table>
The list in this field is populated by the MI_581_Recorded_Settlement_Criteria System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Online Monitoring Flag</td><td>MI_581DMCHE_ONLNE_MNTRNG_FLG_C</td><td>Character (50)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Online Monitoring Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Key Process Variable?</td><td>MI_581DMCHE_KEY_PROCSS_VRBLE_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Key Process Variable</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Electrical Resistance Probes?</td><td>MI_581DMCHE_ELCTRCL_RSSE_PRS_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Electrical Resistance Probes</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Corrosion Coupons?</td><td>MI_581DMCHE_CORROSION_COUPNS_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Corrosion Coupons</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Cl Concentration</td><td>MI_581THNL_HCL_CONCENTRATIN_N</td><td>Numeric</td><td>A value is required if the value in the Damage Mechanism column is 581-Cooling Water Corrosion.</td></tr>
<tr><td>Is Air or Oxidant Present?</td><td>MI_581THNL_IS_AR_OR_OXN_PRT_C</td><td>Character (50)</td><td>A value is required if the Damage Mechanism column contains one of the following values:

581-Hydrochloric Acid Corrosion
581-High Temperature Oxidation
581-Sulfuric Acid Corrosion</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Soil Resistivity	MI_581THNL_SOIL_RESIS_C	Numeric	A value is required if the value in the Damage Mechanism column is *581-Soil Side Corrosion*.
H2S Content	MI_581THNL_H2_CONTENT_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-High Temperature H2/H2S Corrosion*.
Hydrocarbon Type	MI_581THNL_HYDROCARBON_TYPE_C	Character (50)	A value is required if the value in the Damage Mechanism column is *581-High Temperature H2/H2S Corrosion*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • NAPTHA • GAS OIL The list in this field is populated by the MI_581_HYDROCARBON_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Sulphur Concentration	MI_581THNL_SULPHUR_CNCNTRTN_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-High Temperature Sulfidic and Naphthenic Acid*.

Field Caption	Field ID	Data Type (Length)	Comments
Cooling System Type	MI_581THNL_COOLI_SYSTE_TYPE_C	Character (50)	A value is required if the value in the Damage Mechanism column is *581-Cooling Water Corrosion*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Once-Through • Recirculating The list in this field is populated by the MI_581_Cooling_System System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Water Type	MI_581THNL_WATER_TYPE_C	Character (50)	A value is required if the value in the Cooling System Type column is *Once-Through*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Fresh Water • Sea Water The list in this field is populated by the MI_581_Water_Type System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Water Treatment Type	MI_581THNL_WATER_TREAT_TYPE_C	Character (50)	A value is required if: • The value in the Cooling System Type column is *Recirculating*. -or- • The value in the Water Type column is *Fresh Water*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Treated • Untreated The list in this field is populated by the MI_581_Water_Treatment_Type System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Recirculating System Type	MI_581THNL_RECIR_SYSTE_TYPE_C	Character (50)	A value is required if the value in the Cooling System Type column is *Recirculating*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Open • Closed The list in this field is populated by the MI_581_Recirculating_System System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Calcium Hardness	MI_581THNL_CALCI_HARDN_N	Numeric	A value is required if: • The value in the Cooling System Type column is *Recirculating*. -or- • The value in the Water Type column is *Fresh Water* and the value in the Water Treatment Type column is *Untreated*.

Field Caption	Field ID	Data Type (Length)	Comments
Total Dissolved Solids	MI_581THNL_TOTAL_DISSO_SOLID_N	Numeric	A value is required if: • The value in the Cooling System Type column is *Recirculating*. -or- • The value in the Water Type column is *Fresh Water* and the value in the Water Treatment Type column is *Untreated*.
MO Alkalinity	MI_581THNL_MO_ALKAL_N	Numeric	A value is required if: • The value in the Cooling System Type column is *Recirculating*. -or- • The value in the Water Type column is *Fresh Water* and the value in the Water Treatment Type column is *Untreated*.
Oxygen in the Process Stream	MI_581THNL_OXYGN_ADJSTT_FCR_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-Acid Sour Water Corrosion*.
Acid Concentration	MI_581THNL_ACID_CONCENTRATN_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-Sulfuric Acid Corrosion*.

Field Caption	Field ID	Data Type (Length)	Comments
Soil Type	MI_581THNL_SOIL_TYPE_C	Character (50)	A value is required if the value in the Damage Mechanism column is *581-Soil Side Corrosion*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Sand • Silt • Clay The list in this field is populated by the 581_Primary_Soil_Type System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Cathodic Protection Effectiveness</td><td>MI_581THNL_CATHO_PROTE_EFFEC_C</td><td>Character (50)</td><td>A value is required if the value in the Damage Mechanism column is 581-Soil Side Corrosion.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Cathodic Protection Effectiveness</th></tr><tr><td>Cathodic_Protection_exists_NONACE RP0169</td><td>Cathodic Protection exists not per NACE RP0169</td></tr><tr><td>No_Cathodic_Protection</td><td>No Cathodic Protection</td></tr><tr><td>Cathodic_Protection_Tested</td><td>Cathodic Protection is tested annually</td></tr><tr><td>No_CP_Structure</td><td>No Cathodic Protection on Structure</td></tr><tr><td>CP_Tested_NACE RP0169_Supported</td><td>Tested Cathodic protection NACE RP0169 supported</td></tr></table>
The list in this field is populated by the MI_581_Cathodic Protection Effectiveness Factors System Code Table. If the system code table has</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td></td><td></td><td></td><td>been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Coating Present?</td><td>MI_581DMCHE_COATING_PRESENT_C</td><td>Character (3)</td><td>A value is required if the value in the Damage Mechanism column is 581-Soil Side Corrosion.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:
<table><tr><th>System Code ID</th><th>Coating Present?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Coating Age</td><td>MI_581DMCHE_COATING_AGE_N</td><td>Numeric</td><td>A value is required if the value in the Coating Present? column is Y.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Maximum Coating Temperature Rating Exceeded?</td><td>MI_581THNL_MAXCOTEMP_EXCEE_C</td><td>Character (50)</td><td>A value is required if the value in the Coating Present? column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Maximum Coating Temperature Rating Exceeded?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Coating Maintenance Rare or None?</td><td>MI_581THNLCOATI_MAINT_NONE_C</td><td>Character (50)</td><td>A value is required if the value in the Coating Present? column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Coating Maintenance Rare or None?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Coating Type</td><td>MI_581THNL_COATINGTYPE_C</td><td>Character (50)</td><td>A value is required if the value in the Coating Present? column is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Coating Type</th></tr><tr><td>Fusn_Bnd_Epxy</td><td>Fusion Bonded Epoxy</td></tr><tr><td>Lqd_Epxy</td><td>Liquid Epoxy</td></tr><tr><td>Asphl_Enml</td><td>Asphalt Enamel</td></tr><tr><td>Asphlt_Mastic</td><td>Asphalt Mastic</td></tr><tr><td>Coat_Tar_Enml</td><td>Coat Tar Enamel</td></tr><tr><td>Extrd_Polythln_with_mastic_rubber</td><td>Extruded Polyethylene with mastic rubber</td></tr><tr><td>Mill_Appld_PE_Tape_with_mastic</td><td>Mill Applied PE Tape with mastic</td></tr><tr><td>Field_Appld_PE_Tape_with_mastic</td><td>Field Applied PE Tape with mastic</td></tr><tr><td>Three_Layer_PE_or_PP</td><td>Three-Layer PE or PP</td></tr></table>
The list in this field is populated by the 581_Coating_Type System Code Table. If the system code table has been customized, the valid values</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
			could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Amine Type	MI_581THNL_AMINE_TYPE_C	Character (50)	A value is required if the value in the Damage Mechanism column is *581-Amine Corrosion*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • MEA • DEA • MDEA The list in this field is populated by the MI_581_Amine_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Heat Stable Amine Salts (HSAS)	MI_581THNL_HSAS_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-Amine Corrosion*.
Acid Gas Loading	MI_581THNL_ACID_GAS_LOADING_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-Amine Corrosion*.

Field Caption	Field ID	Data Type (Length)	Comments
Amine Concentration	MI_581THNL_AMINE_CONCENTRTN_N	Numeric	A value is required if the value in the Damage Mechanism column is *581-Amine Corrosion*.
HF Concentration	MI_581THNL_HF_CONCE_NBR	Numeric	A value is required if the value in the Damage Mechanism column is *581-Hydrofluoric Acid Corrosion*.
H2S Partial Pressure	MI_581THNL_H2S_PARTI_PRESS_NBR	Numeric	A value is required if the value in the Damage Mechanism column is *581-Alkaline Sour Water Corrosion*.
NH4HS Concentration	MI_581THNL_NH4HS_CONCE_NBR	Numeric	A value is required if the value in the Damage Mechanism column is *581-Alkaline Sour Water Corrosion*.

DME_ExternalDamage Worksheet

In the DME_ExternalDamage worksheet, you can specify the following DMs that you want to create or update:

- 581-Ferritic Component Atmospheric Corrosion
- 581-Ferritic Component Corrosion Under Insulation

These DMs belong to the RBI 581 External Damage Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the component type is *not* Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is not *MI_CCRBICTB*).

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values, which exist in the list in the Damage Mechanism field in the Potential Degradation Mechanisms record: • 581-Ferritic Component Atmospheric Corrosion • 581-Ferritic Component Corrosion Under Insulation
Selected External Corrosion Rate	MI_581_XDME_SEL_EXT_CORR_RT_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Estimated • Calculated • Measured The list in this field is populated by the MI_581_Corrosion_Rate System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Base Material Measured Rate	MI_RBDEMEEV_BM_MEASU_RT_N	Numeric	A value is required if the value in the Selected External Corrosion Rate cell is *Estimated*.
Thinning Type	MI_RBDEMEEV_THIN_TYPE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • General • Localized • Pitting The list in this field is populated by the CORROSION TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Coating Present?</td><td>MI_581DMCHE_COATING_PRESENT_C</td><td>Character (3)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:
<table><tr><th>System Code ID</th><th>Coating Present?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Coating Installation Date</td><td>MI_581DMCHE_CTNG_INSTLLN_DTE_D</td><td>Date</td><td>A value is required if the value in the Coating Present? cell is Y. Enter the value in the following format: YYYY-MM-DD hh:mm:ss</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Coating Quality	MI_RBDEMEEV_COAT_QUAL_C	Character (50)	A value is required if the value in the Coating Present? cell is *Y*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • NONE • POOR • MEDIUM • HIGH The list in this field is populated by the 581_Coating_Quality System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Insulation Condition	MI_RBDEMEEV_INSUL_CON_C	Character (50)	A value is required if the value in the Damage Mechanism cell is *581-Ferritic Component Corrosion Under Insulation*. This cell may only contain one of the following values: • Above Average • Average • Below Average

Field Caption	Field ID	Data Type (Length)	Comments
Piping System Complexity	MI_RBDEMEEV_PIP_SYS_COMPL_C	Character (50)	A value is required if the value in the Damage Mechanism cell is *581-Ferritic Component Corrosion Under Insulation*. This cell may only contain one of the following values: • Above Average • Average • Below Average
Corrosion Rate Adjustment for bad Design/Fabrication	MI_581_XDME_ADJST_FR_DSN_FBN_C	Boolean	Enter *True* or *False*.
Soil to Air Interface Present?	MI_581_XDME_SL_TO_AR_INE_PRT_L	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Atmospheric Condition	MI_581_XDME_ATMOSPHERC_CNDTN_C	Character (50)	A value is required if the value in the Selected External Corrosion Rate cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • MARINE • TEMPERATE • DRY • SEVERE The list in this field is populated by the MI_ATMOSPHERIC_CONDITION System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Last Known Inspection Date	MI_581DMCHE_LST_KNWN_INN_DTE_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Last Known Thickness	MI_581DMCHE_LST_KNWN_THCKNSS_N	Numeric	A value is required if you entered a value in the Last Known Inspection Date cell.

Field Caption	Field ID	Data Type (Length)	Comments
Number of A Level Inspections	MI_581DMCHE_NMR_OF_A_LVL_INS_N	Numeric	A value is required.
Number of B Level Inspections	MI_581DMCHE_NMR_OF_B_LVL_INS_N	Numeric	A value is required.
Number of C Level Inspections	MI_581DMCHE_NMR_OF_C_LVL_INS_N	Numeric	A value is required.
Number of D Level Inspections	MI_581DMCHE_NMR_OF_D_LVL_INS_N	Numeric	A value is required.

DME_ExternalCracking Worksheet

In the DME_ExternalCracking worksheet, you can specify the following DMs that you want to create or update:

- 581-Austenitic Component Cracking Under Insulation
- 581-Austenitic Component Atmospheric Cracking

These DMs belong to the RBI 581 External Cracking Damage Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis. You can specify these DMs only if the component type is *not* Tank Bottom (i.e., the value in the Component Family column in the RBI_Component worksheet is not *MI_CCRBICTB*).

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values, which exist in the list in the Damage Mechanism field in the Potential Degradation Mechanism record: • 581-Ferritic Component Atmospheric Corrosion • 581-Ferritic Component Corrosion Under Insulation
Number of Highest Effective Inspections	MI_RBDEMEEV_NO_HIGH_EFF_INS_N	Numeric	A value is required, and must be between 0 and 6. If you enter *0* in this column, then the value in the Highest Effective Inspection Level column must be *E*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Highest Effective Inspection Level</td><td>MI_RBDEMEEV_HIGH_EFF_INSP_C</td><td>Character (25)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Highest Effective Inspection Level</th></tr><tr><td>A</td><td>Highly Effective</td></tr><tr><td>B</td><td>Usually Effective</td></tr><tr><td>C</td><td>Fairly Effective</td></tr><tr><td>D</td><td>Poorly Effective</td></tr><tr><td>E</td><td>Ineffective (None)</td></tr></table>
The list in this field is populated by the MI_581_Inspection_Effectiveness System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Last Known Inspection Date</td><td>MI_581DMCHE_LST_KNWN_INN_DTE_D</td><td>Date</td><td>Enter a value in the following format: YYYY-MM-DD hh:mm:ss</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Susceptibility Type	MI_581DMCHE_SUSCEPTBLTY_TYPE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Estimated • Detected • Calculated The list in this field is populated by the MI_581_Cracking_Susceptibility_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Atmospheric Condition	MI_581_XCDME_ATMOS_CONDI_C	Character (50)	A value is required if the value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • MARINE • TEMPERATE • DRY • SEVERE The list in this field is populated by the MI_ATMOSPHERIC_CONDITION System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APMM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Susceptibility	MI_581DMCHE_SUSCEPTIBILITY_C	Character (50)	A value is required if the value in the Susceptibility Type cell is *Estimated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • High • Medium • Low • None The list in this field is populated by the MI_581_Cracking_Susceptibility System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Coating Present?</td><td>MI_581DMCHE_COATING_PRESENT_C</td><td>Character (3)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Coating Present?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Coating Installation Date</td><td>MI_581DMCHE_CTNG_INSTLLN_DTE_D</td><td>Date</td><td>A value is required if the value in the Coating Present? cell is Y. Enter the value in the following format: YYYY-MM-DD hh:mm:ss</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Coating Quality	MI_RBDEMEEV_COAT_QUAL_C	Character (50)	A value is required if the value in the Coating Present? cell is *Y*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • NONE • POOR • MEDIUM • HIGH The list in this field is populated by the 581_Coating_Quality System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Piping System Complexity	MI_RBDEMEEV_PIP_SYS_COMPL_C	Character (50)	A value is required if the value in the Damage Mechanism cell is *581-Austenitic Component Cracking Under Insulation.* This cell may only contain one of the following values: • Above Average • Average • Below Average

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Insulation Condition</td><td>MI_RBDEMEEV_INSUL_CON_C</td><td>Character (50)</td><td>A value is required if the value in the Damage Mechanism cell is 581-Austenitic Component Cracking Under Insulation.

This cell may only contain one of the following values:
Above Average
Average
Below Average</td></tr>
<tr><td>Chloride Free Insulation</td><td>MI_581_XCDME_CHL_FREE_INSUL_C</td><td>Character (50)</td><td>A value is required if the value in the Damage Mechanism cell is 581-Austenitic Component Cracking Under Insulation.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Coating Present?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

DME_Cracking Worksheet

In the DME_Cracking worksheet, you can specify the following DMs that you want to

create or update:

- 581-Amine Cracking
- 581-Alkaline Carbonate Stress Corrosion Cracking
- 581-HIC/SOHIC - HF
- 581-HIC/SOHIC - H2S
- 581-Caustic Cracking
- 581-Hydrogen Stress Cracking
- 581-Other Cracking
- 581-Sulfide Stress Cracking
- 581-Chloride Stress Corrosion Cracking
- 581-Polythionic Acid Cracking

These DMs belong to the RBI 581 Cracking Damage Evaluation methodology. These records will be linked to an RBI 581 Risk Analysis.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_ EQUIP_ID_C	Char-acter (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_ SAP_SYSTEM_C	Char-acter (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).

Field Caption	Field ID	Data Type (Length)	Comments
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values, which exist in the list in the Damage Mechanism field in the Potential Degradation Mechanism record: • 581-Amine Cracking • 581-Alkaline Carbonate Stress Corrosion Cracking • 581-HIC/SOHIC - HF • 581-HIC/SOHIC - H2S • 581-Caustic Cracking • 581-Hydrogen Stress Cracking • 581-Other Cracking • 581-Sulfide Stress Cracking • 581-Chloride Stress Corrosion Cracking • 581-Polythionic Acid Cracking
Number of Highest Effective Inspections	MI_RBDEMEEV_NO_HIGH_EFF_INS_N	Numeric	A value is required, and must be between 0 and 6. If you enter *0* in this column, then the value in the Highest Effective Inspection Level column must be *E*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Highest Effective Inspection Level</td><td>MI_RBDEMEEV_HIGH_EFF_INSP_C</td><td>Character (25)</td><td>A value is required.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Highest Effective Inspection Level</th></tr><tr><td>A</td><td>Highly Effective</td></tr><tr><td>B</td><td>Usually Effective</td></tr><tr><td>C</td><td>Fairly Effective</td></tr><tr><td>D</td><td>Poorly Effective</td></tr><tr><td>E</td><td>Ineffective (None)</td></tr></table>
The list in this field is populated by the MI_581_Inspection_Effectiveness System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Last Known Inspection Date</td><td>MI_581DMCHE_LST_KNWN_INN_DTE_D</td><td>Date</td><td>Enter a value in the following format: YYYY-MM-DD hh:mm:ss</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Susceptibility Type	MI_581DMCHE_SUSCEPTBLTY_TYPE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Estimated • Detected • Calculated The list in this field is populated by the MI_581_Cracking_Susceptibility_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Susceptibility	MI_581DMCHE_SUSCEPTIBILITY_C	Character (50)	A value is required *only* if the value in the Susceptibility Type cell is *Estimated*. If the value in the Susceptibility Type cell is *Calculated* or *Detected*, then GE Digital APM will not consider the value that you enter in this cell. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • High • Medium • Low • None The list in this field is populated by the MI_581_Cracking_Susceptibility System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Severity Index Adjustment Factor	MI_581DMCHE_SVRY_INX_ADT_FCR_N	Numeric	A value is required if the value in the Damage Mechanism cell is *581-Other Cracking*. In the baseline GE Digital APM system, this cell may only contain one of the following values: • 1 • 0.2 • 0.02 If the family has been customized, the valid values could be different. This cell may only contain a value that exists in the list in the Severity Index Adjustment Factor field for RBI 581 Cracking Damage Evaluation records.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Online Monitoring Flag</td><td>MI_581DMCHE_ONLNE_MNTRNG_FLG_C</td><td>Character (50)</td><td>A value is required if the value in the Damage Mechanism cell is 581-HIC/SOHIC - H2S.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Online Monitoring Flag</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Key Process Variable?</td><td>MI_581DMCHE_KEY_PROCSS_VRBLE_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag cell is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Key Process Variable</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Hydrogen Probes</td><td>MI_581DMCHE_HYDROGEN_PROBES_C</td><td>Character (3)</td><td>A value is required if the value in the Online Monitoring Flag cell is Y.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Steam Out?</td><td>MI_581CRKEV_STEAM_OUT_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-Amine Cracking or 581-Caustic Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Steam Out?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Sulfur Content of Steel	MI_581CRKEV_SLFR_CNTT_OF_STL_C	Character (50)	A value is required if: • The value in the Damage Mechanism cell is *581-HIC/SOHIC - H2S.* -and- • The value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • High Sulfur Steel (>0.01% S) • Low Sulfur Steel (<=0.01% S) The list in this field is populated by the MI_581_Sulfur_Content_Of_Steel System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Maximum Brinnell Hardness	MI_581CRKEV_MAX_BRIN_HARD_N	Numeric	A value is required if: • The value in the Damage Mechanism cell is *581-Hydrogen Stress Cracking* or *581-Sulfide Stress Cracking.* -and- • The value in the Susceptibility Type cell is *Calculated*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Heat Traced?</td><td>MI_581CRKEV_HEAT_TRACED_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-Amine Cracking or 581-Caustic Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Heat Traced?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
H2S Water Content	MI_581DMCHE_H2S_WTR_CONT_N	Numeric	A value is required if: • The value in the Damage Mechanism cell is *581-HIC/SOHIC - H2S.* -and- • The value in the Susceptibility Type cell is *Calculated*.

Field Caption	Field ID	Data Type (Length)	Comments
Product Form	MI_581CRKEV_PRODUCT_FORM_C	Character (50)	A value is required if: • The value in the Damage Mechanism cell is *581-HIC/SOHIC - H2S.* -and- • The value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Seamless/Extruded Pipe • Rolled Plate The list in this field is populated by the MI_581_Product_Form System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>HF Present?</td><td>MI_581CRKEV_HF_PRESENT_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-HIC/SOHIC - HF or 581-Hydrogen Stress Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>HF Present?</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Amine Solution Type	MI_581CRKEV_AMINE_SOLTN_TYPE_C	Character (50)	A value is required if: • The value in the Damage Mechanism cell is *581-Amine Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Fresh • Lean • Rich The list in this field is populated by the MI_581_Amine_Solution_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Amine Type	MI_581CRKEV_AMINE_TYPE_C	Character (50)	A value is required if: • The value in the Damage Mechanism cell is *581-Amine Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • MEA • DIPA • DEA • Other Amine The list in this field is populated by the MI_581_Amine_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in yourGE Digital APM system, via Configuration Manager, refer to the appropriate table.
Cyanides	MI_RBDEMEEV_CYANI_F	Boolean	Enter *True* or *False.*

Field Caption	Field ID	Data Type (Length)	Comments
Caustic Type	MI_581CRKEV_CAUST_TYPE_C	Character (50)	A value is required if: • The value in the Damage Mechanism cell is *581-Caustic Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Area A • Area B • Area C The list in this field is populated by the MI_581_Caustic_Types System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
NaOH Caustic Concentration	MI_581CRKEV_NH_CSTC_CNCNTRTN_N	Numeric	A value is required if: • The value in the Damage Mechanism cell is *581-Caustic Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*.
CO3 Concentration in Water	MI_581CRKEV_CO3_CONC_IN_WTR_N	Numeric	A value is required if: • The value in the Damage Mechanism cell is *581-Alkaline Carbonate Stress Corrosion Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*.
Chloride Concentration Water Process	MI_581CRKEV_CH_CNC_OF_PR_WTR_C	Numeric	A value is required if: • The value in the Damage Mechanism cell is *581-Chloride Stress Corrosion Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Exposure to Oxygen During Operation/Downtime</td><td>MI_581CRKEV_EXE_TO_OXN_D_OPE_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-Polythionic Acid Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Exposure to Oxygen During Operation/Downtime</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Exposure to Sulfur During Operation/Downtime</td><td>MI_581CRKEV_EXE_TO_SLR_D_OPE_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-Polythionic Acid Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Exposure to Sulfur During Operation/Downtime</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Exposure to Water During Operation/Shutdown</td><td>MI_581CRKEV_EXE_TO_WTR_D_OPN_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-Polythionic Acid Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Exposure to Water During Operation/Shutdown</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Downtime Protection Used</td><td>MI_581CRKEV_DWNTME_PRTCN_USD_C</td><td>Character (50)</td><td>A value is required if:
The value in the Damage Mechanism cell is 581-Polythionic Acid Cracking.
-and-
The value in the Susceptibility Type cell is Calculated.
In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:<table><tr><th>System Code ID</th><th>Downtime Protection Used</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Thermal History (Heat Treatment History)	MI_581CRKEV_THL_HSY_HT_T_HSY_C	Character (50)	A value is required if: • The value in the Damage Mechanism cell is *581-Polythionic Acid Cracking*. -and- • The value in the Susceptibility Type cell is *Calculated*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Solution Annealed • Stabilized Before Welding • Stabilized After Welding The list in this field is populated by the MI_581_Heat_Treatment_History System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

DME_HTHA Worksheet

In the DME_HTHA worksheet, you can specify the 581-High Temperature Hydrogen Attack DM that you want to create or update. This DM, however, is not applicable for a component of type *Storage Tank Bottom*.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	Enter *581-High Temperature Hydrogen Attack*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Is HTHA Damage Observed</td><td>MI_581_HTHA_IS_DAMAG_OBS_C</td><td>Character (50)</td><td>A value is required.

In the baselineGE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Is HTHA Observed</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Is Component Replaced</td><td>MI_581_HTHA_IS_COMPO_REPLA_C</td><td>Character (50)</td><td>A value is required if the value in the Is HTHA Damage Observed cell is Y.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Is Component Replaced</th></tr><tr><td>Y</td><td>Yes</td></tr><tr><td>N</td><td>No</td></tr></table>
The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Exposure Hydrogen Partial Pressure</td><td>MI_581_HTHA_HYDRO_PAR_PRESS_N</td><td>Numeric</td><td>A value is required if the value in the Is HTHA Damage Observed cell is N.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Delta Temperature	MI_581_HTHA_DELTA_TEMPE_C	Character (50)	A value is required if the value in the Is HTHA Damage Observed cell is *N*. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • >=0 • >= -50 and < 0 • >= -100 and < -50 • < -100 The list in this field is populated by the MI_581_HTHA_Delta_Temperature System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

DME_BrittleFracture Worksheet

In the DME_BrittleFracture worksheet, you can specify the following DMs that you want to create or update:

- 581-Sigma Phase Embrittlement
- 581-885F Embrittlement
- 581-Brittle Fracture
- 581-Low Alloy Steel Embrittlement

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_ EQUIP_ID_C	Character (255)	Values in this column must match values entered in the Assets worksheet. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
CMMS System	MI_EQUIP000_ SAP_SYSTEM_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Equipment Technical Number	MI_EQUIP000_ EQUIP_TECH_ NBR_C	Character (255)	Values in this column must match values entered in the Assets worksheet, if they exist. Multiple DMs can be linked to the same asset (i.e., rows may have the same value in this column).
Component	MI_RBICOMPO_ COMPO_C	Character (250)	Values in this column must match values entered in the RBI_Component worksheet, if they exist. Multiple DMs can be linked to the same component (i.e., rows may have the same value in this column).
Component Type	MI_RBICOMPO_ COMPO_TYPE_C	Character (60)	Values in this column must match values that you entered in the Component Type column on the RBI_Component worksheet for the associated component.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Unique ID	MI_ANALYSIS_ID	Character (255)	Values in this column must match values entered in the RBI_581_Analysis worksheet, if they exist. Multiple DMs can be linked to the same analysis (i.e., rows may have the same value in this column).
Damage Mechanism	MI_RBDEMEEV_DAM_MECH_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following values, which exist in the list in the Damage Mechanism field in the Potential Degradation Mechanism record: • 581-Sigma Phase Embrittlement • 581-885F Embrittlement • 581-Brittle Fracture • 581-Low Alloy Steel Embrittlement

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Material Exemption Curve</td><td>MI_581BRFRAC_MTRL_EXMPTNCRVE_N</td><td>Character (50)</td><td>A value is required if the value in the Damage Mechanism cell is 581-Brittle Fracture or 581-Low Alloy Steel Embrittlement.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Material Exemption Curve</th></tr><tr><td>A</td><td>Temperature Exemption A Curve</td></tr><tr><td>B</td><td>Temperature Exemption B Curve</td></tr><tr><td>C</td><td>Temperature Exemption C Curve</td></tr><tr><td>D</td><td>Temperature Exemption D Curve</td></tr></table>
The list in this field is populated by the MI_581_Material_Temperature_Exemption_Curves System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Minimum Allowable Temperature	MI_581BRFRAC_MNMM_ALLWBLETME_N	Numeric	A value is required if the Damage Mechanism cell contains one of the following values: • 581-Sigma Phase Embrittlement • 581-885F Embrittlement • 581-Low Alloy Steel Embrittlement
Minimum Design Metal Temperature (MDMT)	MI_581BRFRAC_MNM_DSN_MTL_MDT_N	Numeric	A value is required if the Damage Mechanism cell contains one of the following values: • 581-885F Embrittlement • 581-Low Alloy Steel Embrittlement
Critical Exposure Temperature(CET)	MI_581BRFRAC_CRTCLEXPSRE_TMT_N	Numeric	A value is required if the value in the Damage Mechanism cell is *581-Brittle Fracture*.
Is CET at the MAWP >= -29°C	MI_581BRIFRAC_IS_CT_PVPCRT_L	Boolean	Enter *True* or *False*.
Is Cyclic service Design Requirement	MI_581BRIFRAC_IS_CYC_SREFRQT_L	Boolean	Enter *True* or *False*.
Is Equipment Or Circuit Subject to EVN Cracking	MI_581BRIFRAC_IS_EQT_CRCRG_L	Boolean	Enter *True* or *False*.
Is Equipment Or Circuit Subject to Shock Chilling	MI_581BRIFRAC_IS_EQT_CR_SCHG_L	Boolean	Enter *True* or *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Is Fabricated From P-1 and P-3 Steels	MI_581BRIFRAC_IS_FBD_FRMP65F_L	Boolean	Enter *True* or *False*.
Is Nominal Operating Conditions Changed	MI_581BRIFRAC_IS_NML_OPGCCHD_L	Boolean	Enter *True* or *False*.
Is Nominal Uncorroded Thickness < 50.8 mm (2 inch)	MI_581BRIFRAC_NML_UNDTHS_INH_L	Boolean	Enter *True* or *False*.
Is Satisfied All Requirements For Fabrication	MI_581BRIFRAC_IS_STD_ALLRFRN_L	Boolean	Enter *True* or *False*.
Fracture Appearance Transition Temperature (FATT)	MI_581BRFRAC_FRCEAPE_TRN_TME_N	Numeric	A value is required if the value in the Damage Mechanism cell is *581-Low Alloy Steel Embrittlement*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Sigma Percentage</td><td>MI_581BRIFRAC_SIGMA_AMOUNT_N</td><td>Numeric</td><td>A value is required if the value in the Damage Mechanism cell is 581-Sigma Phase Embrittlement.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Sigma Percentage</th></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>3</td></tr><tr><td>4</td><td>4</td></tr><tr><td>5</td><td>5</td></tr><tr><td>6</td><td>6</td></tr><tr><td>7</td><td>7</td></tr><tr><td>8</td><td>8</td></tr><tr><td>9</td><td>9</td></tr><tr><td>10</td><td>>=10</td></tr></table>
The list in this field is populated by the MI_581_Sigma_Percentage System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

About the Risk Based Inspection (RBI) 581 Data Loader Load Verification

After you load data, you should perform the following steps in GE Digital APM to confirm the integrity and accuracy of the data imported from the data loader workbook:

- Access the details of the import job. These details will indicate if any errors, minor or otherwise, were encountered during the import job. The log may help account for any records that are unexpectedly absent after the data load.
- In Risk Based Inspection or Record Manager, access the assets specified in the data loader workbook, and then verify that the expected components are present or updated, and that any associated records that you expected to be created are also present in the database.

  You can enter the following query in the **SQL** workspace of the **Query** page to review a list of components created after a specified date:

  SELECT [MI_CCRBICOM].LAST_UPDT_DT "LAST_UPDT_DT", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_C] "Component", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_TYPE_C] "Component Type", [MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] "Equipment", [MI_CCRBICOM].ENTY_ID "ENTY_ID" FROM [MI_CCRBICOM] WHERE [MI_CCRBICOM].LAST_UPDT_DT >= CONVERT(VARCHAR(255), (? :d :caption='Enter a Date'), 110) ORDER BY [MI_CCRBICOM].LAST_UPDT_DT Desc,[MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] Asc

  You can enter the following query in the **Oracle** workspace of the **Query** page to review a list of components created after a specified date:

  SELECT [MI_CCRBICOM].LAST_UPDT_DT "LAST_UPDT_DT", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_C] "Component", [MI_CCRBICOM].[MI_RBICOMPO_COMPO_TYPE_C] "Component Type", [MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] "Equipment", [MI_CCRBICOM].ENTY_ID "ENTY_ID" FROM [MI_CCRBICOM] WHERE [MI_CCRBICOM].LAST_UPDT_DT >= to_date(to_char((? :d :caption='Enter a Date'),'mm/dd/yyyy'),'mm/dd/yyyy') ORDER BY [MI_CCRBICOM].LAST_UPDT_DT Desc,[MI_CCRBICOM].[MI_RBICOMPO_EQUIP_C] Asc

  When prompted, enter the date on which the data load was performed.

About the Risk Based Inspection (RBI) Corrosion Loop Data Loader

GE Digital APM, through the Risk Based Inspection module, provides the functionality to carry out a Semi-Quantitative Analysis (RBI Criticality Analysis) on Corrosion Loops, which are comprised of various types of linked RBI Ccomponents. Using the Risk Based Inspection (RBI) Corrosion Loop Data Loader, you can generate all Corrosion Loops for a Process Unit along with the related RBI Components and Reference Documents.

Using the Risk Based Inspection (RBI) Corrosion Loop Data Loader, you can create or update Corrosion Loops, link RBI Components, and Reference Documents.

About the Risk Based Inspection (RBI) Corrosion Loop Data Loader Requirements

This documentation assumes that your organization has completed fully the deployment of the Risk Based Inspection module. The Risk Based Inspection (RBI) Corrosion Loop Data Loader should only be used after the Risk Based Inspection module has been implemented.

The data loader can be used to set up an RBI program during implementation. Because the RBI Components must exist prior to the Corrosion Loop data load, the Risk Based Inspection (RBI) 580 Data Loader should be used before the Risk Based Inspection (RBI) Corrosion Loop Data Loader.

When you create or update a Corrosion Loop, it is linked to a Functional Location, which must already exist, and then linked to Criticality RBI Components and Reference Documents that you specify.

The following data must be defined prior to loading Corrosion Loop data:

- Site References
- Equipment Taxonomies
- Functional Location Families

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI RBI Analyst Security Group or a Security Role that is associated with this Security Group.

About the Risk Based Inspection (RBI) Corrosion Loop Data Loader Data Model

This content has been intentionally excluded from the GE Digital APM product documentation website. This content is available to you via the product documentation that is provided within the GE Digital APM system.

About the Risk Based Inspection (RBI) Corrosion Loop Data Loader General Loading Strategy

Best Practices

When importing data using the Risk Based Inspection (RBI) Corrosion Loop Data Loader, you must use the following best practices:

- ID fields (Row 2 of each worksheet) must not include special characters or spaces.
- The data loader workbook contains sample data in each column. It is only for your reference. You must remove this data before using the data loader workbook.
- Columns (including columns representing custom fields) in the worksheets should be formatted as Text.
- Import a maximum of 500 records in each data load.
- For Oracle databases, valid cell values are case-sensitive.
- For a Corrosion Loop to *have* associated RBI Components, the RBI Components that will be linked to the Corrosion Loop must already exist in the GE Digital APM system.
- If RBI Components do not exist, the Corrosion Loop Data Loader will create or update Corrosion Loop data, but it will not have any associated RBI Components.

Load Sequence

The RBI Corrosion Loop data load is performed in a specific sequence to create all necessary relationships between records:

Note: Prior to deploying the Risk Based Inspection (RBI) Corrosion Loop Data Loader, the Risk Based Inspection (RBI) 580 Data Loader must be implemented. The Corrosion Loop Data Loader uses the values in the Functional Location field, the Corrosion Loop field, the Equipment field, and the Component field to look up the associated component record and to link said RBI Component to a Corrosion Loop. . For RBI Components to be linked to a Corrosion Loop, the RBI Components must already exist and be present in the Components worksheet. If RBI Components do not exist, the Corrosion Loop Data Loader will create or update Corrosion Loop data, but it will not have any associated RBI Components.

1. The Corrosion Loops worksheet is processed. An existing Functional Location will be looked up based on the Functional Location (MI_EQUIP000_EQUIP_ID_C) and the RBI Corrosion Loop ID (MI_RBI_SYSTEM_RBI_SYS_ID_C).

   If a Corrosion Loop specified on the worksheets exists, it will be updated. If a Corrosion Loop cannot be found, then a new Corrosion Loop will be created.

2. The RBI Components worksheet is processed. An existing RBI Component is

looked up based on the Equipment ID (MI_EQUIP000_EQUIP_ID_C), the Equipment Technical Number (MI_EQUIP000_EQUIP_TECH_NBR_C), the Component (MI_RBICOMPO_COMPO_C) and the Component Type (MI_RBICOMPO_COMPO_TYPE_C). If found, that RBI Component will be linked to the specified Corrosion Loop (MI_RBI_SYSTEM_RBI_SYS_ID_C). If no RBI Components exist, this worksheet is skipped.

If the RBI Component is specified in the worksheet, but that RBI Component cannot be looked up, an error is added to the log.

3. The Reference Document worksheet is processed. The Corrosion Loop will be looked up by the Functional Location (MI_FNCLOC00_FNC_LOC_C), the RBI Corrosion Loop (MI_RBI_SYSTEM_RBI_SYS_ID_C), and the Reference Document ID (CTIT_ID).

   If a Reference Document specified on the worksheet exists, it will be updated. If a Reference Document cannot be found, than a new Reference Document will be created.

Data that you specify in the field on each worksheet will be included in the new records.

About the Risk Based Inspection (RBI) Corrosion Loop Data Loader Workbook Layout and Use

In order to import data using the Risk Based Inspection (RBI) Corrosion Loop Data Loader, GE Digital APM provides an Excel workbook, **Risk Based Inspection (RBI) Corrosion Loop.xlsx**, which supports baseline Risk Based Inspection in GE Digital APM. This workbook must be used to perform the data load. You can modify the Excel workbook to include custom fields used by your organization.

Note: The Excel workbook is referred to throughout this documentation as the *data loader workbook*.

The following table lists the worksheets that are included in the data loader workbook.

Worksheet	Description
Corrosion_ Loops	This worksheet is used to specify which Corrosion Loops the user wants to link to Functional Locations.
Components	This worksheet is used only to lookup fields for unique, existing RBI Components to link to Corrosion Loops.
Reference_ Document	This worksheet is used to specify the Functional Location key fields as well as the Corrosion Loop key fields.

Color Coding

Certain columns on the worksheets have different functions and requirements. To illustrate this, certain columns are color-coded. The following table lists the colors and what they represent.

Color	Description	Comments
	Required Key Fields	Indicates columns that contain values that are used by the Risk Based Inspection (RBI) Corrosion Loop Data Loader to look up and create records. If these columns are removed from the worksheets, the data load will fail. While the *worksheets* require that these columns be present, *values* are not necessarily required in these columns.
	Fields Required for Saving Records	Indicates columns that contain values that are required to save the record.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for Inspection Management, should contain values.

	Custom Fields	Indicates columns in which you can specify custom fields.

Limitations

The Risk Based Inspection (RBI) Corrosion Loop Data Loader has the following limitations:

- The values that you enter in the data loader workbook are case-sensitive.
- If you reimport data, the records that have been created by the Data Loader will be *updated*. Therefore, while reimporting data, if you remove the data for a field in the data loader workbooks, the value for the corresponding field in GE Digital APM will be either a default value or blank.

Corrosion_Loops Worksheet

On the Corrosion_Loops worksheet, you will specify which Corrosion Loops the user wants to link to Functional Locations.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location	MI_FNCLOC00_FNC_LOC_C	Character (255)	The value in this column is used to break the data into smaller data loads.
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	A value is required for each row.
RBI Corrosion Loop ID	MI_RBI_SYSTEM_RBI_SYS_ID_C	Character (255)	If this column is populated, the Corrosion Loop referenced in this column will be identified by a combination of the Functional Locations and CMMS System.
RBI Corrosion Loop Description	MI_RBI_SYSTEM_RBI_SYS_DESC_C	Character (2000)	This column is not required for calculations; however, providing a value for this column is considered Best Practice.
RBI Corrosion Loop From	MI_RBI_SYSTEM_RBI_SYS_FROM_C	Character (255)	This column is not required for calculations; however, providing a value for this column is considered Best Practice.

Field Caption	Field ID	Data Type (Length)	Comments
RBI Corrosion Loop To	MI_RBI_SYSTEM_RBI_SYS_TO_C	Character (255)	This column is not required for calculations; however, providing a value for this column is considered Best Practice.

Components Worksheet

On the Components worksheet, you will use lookup fields to find unique, existing RBI Components to link to Corrosion Loops.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location	MI_FNCLOC00_FNC_LOC_C	Character (50)	Values in this column must match values entered on the Corrosion_Loop worksheet, if they exist.
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Corrosion_Loop worksheet, if they exist.
RBI Corrosion Loop ID	MI_RBI_SYSTEM_RBI_SYS_ID_C	Character (255)	Values in this column must match values entered on the Corrosion_Loop worksheet, if they exist.
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	A value is required for each row.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	A value is required for each row.
Component	MI_RBICOMPO_COMPO_C	Character (250)	A value is required for each row.

Field Caption	Field ID	Data Type (Length)	Comments
Component Type	MI_RBICOMPO_COMPO_TYPE_C	Character (60)	A value is required for each row. This cell may only contain a value that exists in the list in the Component Type field for Criticality RBI Component records.

Reference_Document Worksheet

On the Reference_Document worksheet, you will specify the Functional Location key fields as well as the Corrosion Loop key fields.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location	MI_FNCLOC00_FNC_LOC_C	Character (255)	Values in this column must match values entered on the Corrosion_Loop worksheet, if they exist.
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	Values in this column must match values entered on the Corrosion_Loop worksheet, if they exist.
RBI Corrosion Loop ID	MI_RBI_SYSTEM_RBI_SYS_ID_C	Character (255)	Values in this column must match values entered on the Corrosion_Loop worksheet, if they exist.
Reference Document ID	CTIT_ID	Character (255)	A value is required for each row.
Description	CTIT_DESC_TX	Character (255)	This column is not required for calculations; however, providing a value for this column is considered Best Practice.

Field Caption	Field ID	Data Type (Length)	Comments
Document Path	MIRD_DOC_PATH_CHR	Character (1023)	This column is not required for calculations; however, providing a value for this column is considered Best Practice.

About the Risk Based Inspection (RBI) Corrosion Loop Data Loader Load Verification

Following a data load, you should perform the following steps in GE Digital APM to confirm the integrity and accuracy of the data imported from the data loader workbook:

- Access the details of the import job. These details will indicate if any errors, minor or otherwise, were encountered during the import job. The log may help account for any records that are unexpectedly absent after the data load.
- In Risk Based Inspection or Record Manager, access the Corrosion Loops specified in the data loader workbook, and then verify that the expected Corrosion Loops are present or updated, and that any associated records that you expected to be created are also present in the database.

  You can enter the following query in the **SQL** workspace of the **Query** page to review a list of components created after a specified date:

  SELECT [MI_RBiSYS00].LAST_UPDT_DT "LAST_UPDT_DT", [MI_RBiSYS00].[MI_RBI_SYSTEM_RBI_SYS_ID_C] "RBI Corrosion Loop ID", [MI_RBiSYS00].[MI_RBI_SYSTEM_RBI_SYS_DESC_C] "RBI Corrosion Loop Description", [MI_RBiSYS00].[MI_RBI_SYSTEM_RBI_SYS_TO_C] "RBI Corrosion Loop To", [MI_RBiSYS00].[MI_RBI_SYSTEM_RBI_SYS_FROM_C] "RBI Corrosion Loop From", [MI_RBICOMPO].[MI_RBICOMPO_COMPO_C] "RBI Component ID", [MI_RBICOMPO].[MI_RBICOMPO_COMPO_TYPE_C] "Component Type" FROM [MI_RBiSYS00] LEFT JOIN {MIR_HSRBICMP} JOIN [MI_RBICOMPO] ON {MIR_HSRBICMP}.SUCC_ENTY_KEY = [MI_RBICOMPO].ENTY_KEY ON [MI_RBiSYS00].ENTY_KEY = {MIR_HSRBICMP}.PRED_ENTY_KEY WHERE [MI_RBiSYS00].LAST_UPDT_DT >= CONVERT(VARCHAR(255), (? :d :caption='Enter a Date'), 110)

About the Thickness Monitoring (TM) Data Loaders

The following Data Loaders are available in Thickness Monitoring:

- Thickness Monitoring (TM) Equipment Data Loader
- Thickness Monitoring (TM) Functional Location Data Loader

Throughout the documentation, these Data Loaders are collectively called the Thickness Monitoring (TM) Data Loaders. You can use them to implement Thickness Monitoring when you have thickness measurement data in a legacy system. To import data using these Data Loaders, GE Digital APM provides the following Excel templates:

- Thickness Monitoring (TM) Equipment.xlsx
- Thickness Monitoring (TM) Functional Location.xlsx

These templates support baseline Thickness Monitoring in GE Digital APM. You must export measurement data from your legacy system so that the data can be used to populate the templates. The data from the templates will then be imported into GE Digital APM using the corresponding Data Loaders.

Note: The Excel templates are referred to throughout this documentation as the *data loader workbooks*.

The data loader workbooks allow you to:

- Create or update Corrosion Analysis Settings (CAS) records for an Asset (i.e., Equipment or Functional Location), TML Group, or TML.
- Create or update TML Group records, and link each of them to an Asset.
- Create or update TML records, and link each of them to an Asset or TML Group.
- Create or update Thickness Measurement records, and link them to a TML.

About the Thickness Monitoring (TM) Data Loaders Requirements

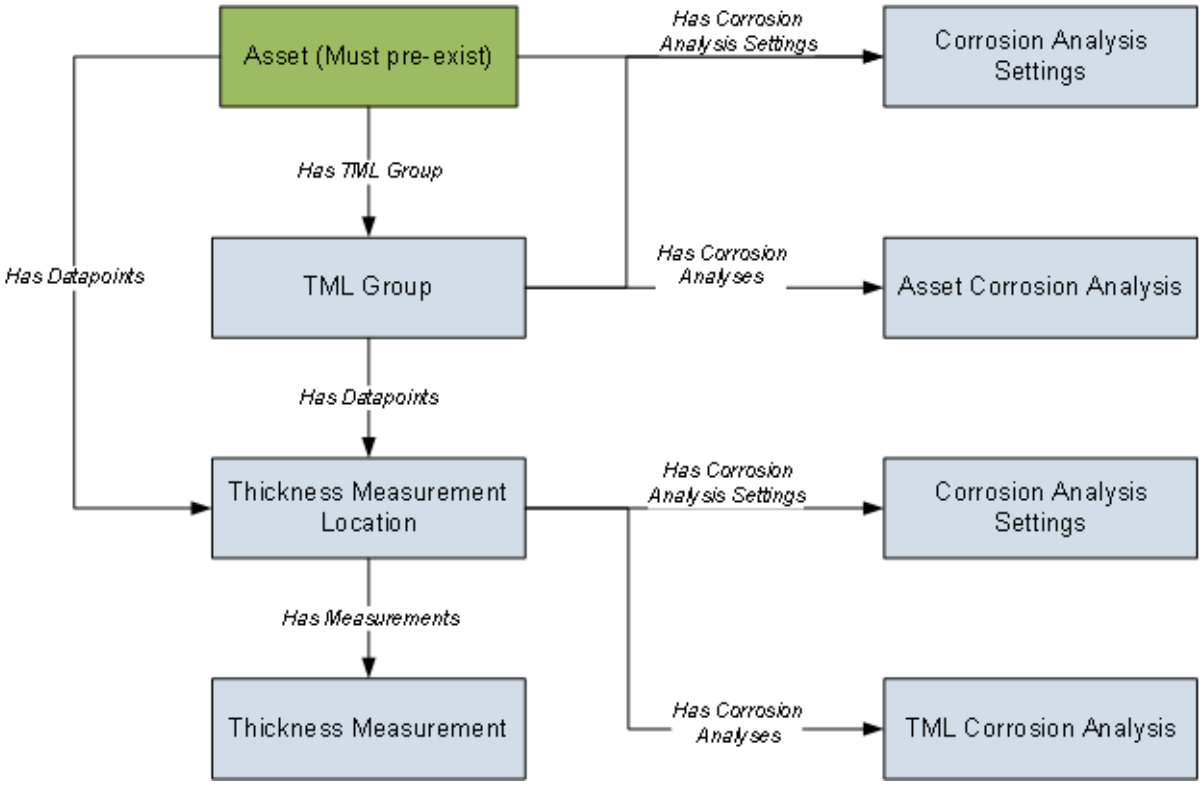
Before you use the data loader workbooks, you must complete the following steps:

- Ensure that the Thickness Monitoring module is deployed.
- Ensure that the following licenses are active:
  - APM Connect Plus
  - Thickness Monitoring
- Ensure that the following data is present:
  - Site Reference
  - Equipment Taxonomy
  - Equipment and Functional Location Families
  - Units of Measure Conversion Sets
  - Stress Tables (GE Digital provides Stress Tables for Piping, Pressure Vessels, and Tanks. If you want to use values from these Stress Tables with the data loader workbook, you must ensure that the records are imported into your database prior to performing the data load).
- Ensure that you have set up appropriate relationships and key fields. To do so, you must login as a member of the MI Thickness Monitoring Administrator Security Group.
- Create a relationship between TML Groups and Assets. To do so, configure family preferences, specifying the following values:
  - Asset-to-Subcomponent Relationship: *Has TML Group*
  - Subcomponent-to-Asset Relationship: *Has TML Group*
  - Component ID Field: *TML Group ID*

  Note: By default, the relationship is created between *Equipment* and TML Groups. If you want to use the Thickness Monitoring (TM) Functional Location Data Loader, in the drop-down list box at the top of the workspace, select **Functional Location**.
- The Security User loading the data must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI Thickness Monitoring Administrator or the MI Thickness Monitoring Inspector Security Group or a Security Role that is associated with at least one of these Security Groups.
- The data loader workbooks contain sample data in each column. It is only for your reference. You must remove this data before using the data loader workbooks.

About the Thickness Monitoring (TM) Data Loaders Data Model

The Thickness Monitoring (TM) Data Loaders do not load the entire data model illustrated in the normal help documentation. The following data model illustrates which records the Data Loaders support. Assets (i.e., Equipment or Functional Location records), illustrated in green, must exist prior to importing data.



About the Thickness Monitoring (TM) Data Loaders General Loading Strategy

This topic describes the best practices to loading the data and the order in which the data will be loaded.

Best Practices

- For Oracle databases, valid cell values are case-sensitive.
- The imported data must load in a specific sequence in order to successfully populate fields, to create records, and to link them to the predecessor and successor records.
- The Thickness Monitoring (TM) Data Loaders map the datasheet columns in the data loader workbooks to fields in GE Digital APM families by their *position*. Therefore, you must not change the column positions and IDs. You can, however, change the captions if needed.
- ID fields must not include special characters or spaces.
- Columns (including columns representing custom fields) in the worksheets should be formatted as *Text*.
- You must consider the rules described in the Workbook Layout and Use section of this document while using the data loader workbooks.
- Details related to an Equipment that is linked to a TML Group or a TML must always be entered on the Assets and Asset_CAS worksheets of the Thickness Monitoring (TM) Equipment Data Loader even if the Asset has already been loaded earlier. Similarly, details related to a Functional Location that is linked to a TML Group or a TML must always be entered on the Functional_Location and Functional_Location_CAS worksheets of the Thickness Monitoring (TM) Funcational Location Data Loader even if the Functional Location has already been loaded earlier.
- In addition to the fields included in the data loader workbooks, if you want to add values for more fields for a record, you can add columns for those fields on the appropriate worksheet.

  Note: The fields that you want to add to the data loader workbooks must already exist in the corresponding family. If not, you must add the fields to the family via Configuration Manager.

- Do not delete a worksheet in the data loader workbooks.

Load Sequence

The data must be loaded in the following sequence to successfully populate fields, create records, and link them to the predecessor and successor records:

1. The Assets or the Functional_Location worksheet is processed.

   If you are using the Thickness Monitoring (TM) Equipment Data Loader, then it searches for the Equipment that corresponds to the Equipment ID, CMMS System, and Equipment Technical Number information that you provide on the Assets worksheet. If you are using the Thickness Monitoring (TM) Functional Location Data Loader, then it searches for the Functional Location that corresponds to the Functional Location ID and CMMS System information that you provide on the Functional_Location worksheet.

   If an Asset specified on the worksheet does not exist, it will not be loaded. In addition, the TML Groups and TMLs linked to the Asset are not loaded.

2. The Asset_CAS or the Functional_Location_CAS worksheet is processed.

   If you have entered values in all the mandatory cells and if the details of an Asset on this worksheet match the details on the *Assets* or the *Functional_Location* worksheet, then:

   - A Corrosion Analysis Settings record is created, and linked to the Asset using the *Has Corrosion Analysis Settings* relationship.
   - An Asset Corrosion Analysis record is created, and linked to the Asset using the *Has Corrosion Analyses* relationship.

   If you do not enter values (in cells other than the mandatory ones) on this worksheet, then default values are used.

3. The TML_Group worksheet is processed. For each TML Group, if the details of the Asset on the *TML_Group* worksheet match the details on the *Assets* or the *Functional_Location* worksheet, then a TML Group record is created, and linked to the Asset using the *Has TML Group* relationship.

4. The TML_Group_CAS worksheet is processed. For each TML Group:
   - A Corrosion Analysis Settings record is created, and linked to the TML Group using the *Has Corrosion Analysis Settings* relationship. The fields in the Corrosion Analysis Settings record are populated with the corresponding values on the Asset_CAS or the Functional_Location_CAS worksheet.
   - If you have entered values on the TML_Group_CAS worksheet, the values in the fields in the Corrosion Analysis Settings record linked to the TML Group are replaced with the values on the TML_Group_CAS worksheet.
   - An Asset Corrosion Analysis record is created, and linked to the TML Group using the *Has Corrosion Analyses* relationship.

5. The TML worksheet is processed.
   - If you have entered a value in the TML Group ID column on this worksheet, then a Thickness Measurement Location is created and linked to the *TML Group* using the *Has DataPoints* relationship. Otherwise, the TML is linked to the *Asset* that you have specified on this worksheet.

6. The TML_CAS worksheet is processed. For each TML:

- A Corrosion Analysis Settings record is created, and linked to the TML using the *Has Corrosion Analysis Settings* relationship. The fields in the Corrosion Analysis Settings record are populated with the corresponding values on the TML_Group_CAS, Asset_CAS, or Functional_Location_CAS worksheet, depending on whether the TML is linked to a TML Group, Equipment, or Functional Location respectively.
- A TML Corrosion Analysis record is created, and linked to the TML using the *Has Corrosion Analyses* relationship.
- If you have entered values on this worksheet, the values in the fields in the Corrosion Analysis Settings record linked to the TML are replaced with the values on the TML_CAS worksheet.

7. The Measurements worksheet is processed. For each row on this worksheet, a Thickness Measurement record is created (or updated), and linked to the TML using the *Has Measurements* relationship.

> **Note:** For a given TML, if two or more rows contain the same value in the Measurement Date field, then only *one* Measurement record is created. The fields in that record are populated with values in the last row among them.

After you load the data, the updated assets appear in the **Assets** and **Assets Requiring a Calculation** sections on the **Thickness Monitoring Overview** page. You must calculate all the analyses that you have loaded because they are not calculated automatically after you load the data.

About the Thickness Monitoring (TM) Data Loaders Workbook Layout and Use

The data loader workbooks contain one worksheet for each node that is represented in the data model. The following table provides a list of the worksheets that are included in the data loader workbooks.

Worksheet	Description
Assets	This worksheet is used to specify existing Equipment records to which Thickness Measurement Locations (TMLs) and TML Groups will be linked. This worksheet is included only in the Thickness Monitoring (TM) Equipment Data Loader.
Functional_Location	This worksheet is used to specify existing Functional Location records to which Thickness Measurement Locations (TMLs) and TML Groups will be linked. This worksheet is included only in the Thickness Monitoring (TM) Functional Location Data Loader.
Asset_CAS	This worksheet is used to specify Corrosion Analysis Settings records for an Equipment. This worksheet is included only in the Thickness Monitoring (TM) Equipment Data Loader.
Functional_Location_CAS	This worksheet is used to specify Corrosion Analysis Settings records for a Functional Location. This worksheet is included only in the Thickness Monitoring (TM) Functional Location Data Loader.
TML _Group	This worksheet is used to create or update TML Group records.
TML_Group_CAS	This worksheet is used to specify Corrosion Analysis Settings records for a TML Group.
TML	This worksheet is used to create or update Thickness Measurement Location records.
TML_CAS	This worksheet is used to specify Corrosion Analysis Settings records for a TML.
MEASUREMENTS	This worksheet is used to specify Thickness Measurement records.
(Picklist)	This worksheet contains a list of valid values that you can enter in each column (as applicable) in the aforementioned worksheets. When you load data using the data loader, the data on this worksheet is *not* loaded.

Color Coding

Certain columns on the worksheets have different functions and requirements. To illustrate this, certain columns are color-coded. The following table lists the colors and what they represent.

Color	Description	Comments
	Required Key Fields	Indicates columns that contain values that are used by the Risk Based Inspection (RBI) 580 Data Loader to look up and create records. If these columns are removed from the worksheets, the data load will fail. While the worksheets require that these columns be present, values are not necessarily required in these columns.
	Fields Required for Calculation	Indicates columns that contain values that are required to perform calculations in Risk Based Inspection. Some cells only require values in certain cases. Such cases are found in parentheses in the first row of each worksheet.
	Recommended Fields	Indicates columns that, according to GE Digital Best Practice for Risk Based Inspection, should contain values.
	Custom Fields	Indicates columns where you can specify custom fields.

Limitations

The Thickness Monitoring (TM) Data Loaders have the following limitations:

- If you modify the format of the values in columns on any of the worksheets, you will not be able to import data.
- You cannot create or update *nominal* measurements using the data loader workbooks. You can only create or update *actual* measurements.
- The values that you enter in the data loader workbooks are case-sensitive.
- You cannot link an RBI Component to a TML Group using the data loader workbooks.
- You cannot relocate, renew, or organize TMLs using the data loader workbooks.
- You cannot skip measurements using the data loader workbooks.
- If you reimport data, the records that have been created by the Thickness Monitoring (TM) Data Loaders will be *updated*. Therefore, while reimporting data related to a record, if you remove the data for a field in the data loader workbooks, the value for the corresponding field in GE Digital APM will be either a default value or blank.

> ⓘ **Tip:** If you do not want to update a field value, you can remove the corresponding column from the data loader workbooks. You cannot, however, remove columns that correspond to required fields.

Assets Worksheet

On the Assets worksheet, you will specify Equipment to which you want to link Thickness Measurement Locations (TMLs) and TML Groups. This worksheet is included only in the Thickness Monitoring (TM) Equipment Data Loader. The columns that appear on this worksheet also appear on every subsequent worksheet in the Thickness Monitoring (TM) Equipment Data Loader. They are used to identify the records that will be linked, directly or indirectly, to the Equipment. The combination of values in the three columns on this worksheet must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment record for an asset has a value in the CMMS System field, enter that value in this column.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	If you are required to enter a value for the CMMS System cell for a piece of equipment, and the Equipment record has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.

Functional_Location Worksheet

On the Functional_Location worksheet, you will specify Functional Locations to which you want to link Thickness Measurement Locations (TMLs) and TML Groups. This worksheet is included only in the Thickness Monitoring (TM) Functional Location Data Loader. The columns that appear on this worksheet also appear on every subsequent worksheet in the Thickness Monitoring (TM) Functional Location Data Loader. They are used to identify the records that will be linked, directly or indirectly, to the Functional Locations. The combination of values in the two columns on this worksheet must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value.
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	If the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.

Asset_CAS Worksheet

On the Asset_CAS worksheet, you will specify Corrosion Analysis Settings records for an Equipment. If you do not enter values on this worksheet, the default values are used. This worksheet is included only in the Thickness Monitoring (TM) Equipment Data Loader.

In addition, the values that you enter on this worksheet are used to specify Corrosion Analysis Settings for associated TML Groups and TMLs. You can, however, overwrite these values by specifying different values on the TML_Group_CAS and TML_CAS worksheets respectively.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment record for an asset has a value in the CMMS System field, enter that value in this column.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Equipment Technical Number</td><td>MI_EQUIP000_EQUIP_TECH_NBR_C</td><td>Character (255)</td><td>If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column.

If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.</td></tr>
<tr><td>Inspection Type</td><td>MI_CA_SET_ANALY_TYPE_CHR</td><td>Character (50)</td><td>If you do not enter a value in this cell, then data in this row is not loaded.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Inspection Type</th></tr><tr><td>UT</td><td>Ultrasonic Thickness</td></tr><tr><td>RT</td><td>Radiographic Thickness</td></tr><tr><td>TML</td><td>Thickness Measurement Location</td></tr></table>
The list in this field is populated by the CITP System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Controlling Corrosion Rate	MI_CA_SET_CR_ROLL_OPT_CHR	Character (50)	This cell may only contain one of the following values: • Average • Formula • Maximum The default value is *Maximum*.
Comments	MI_CA_SET_COM_CON_COR_RAT_CHR	Character (2500)	None
Apply CCR to TML Rem Life Next Insp Date Calc	MI_CA_SET_APPLY_CR_FLG	Boolean	Enter *True* or *False*. The default value is *False*.
Safety Factor	MI_CA_SET_AVG_CR_SFTY_FCTR_NBR	Numeric	The default value is *1*.
Minimum Number of TMLs	MI_CA_SET_AVG_CR_MN_TML_NBR	Numeric	The default value is *1*.
Percentile	MI_CA_SET_AVG_CR_PERC_NBR	Numeric	The default value is *100*.
Std Deviation Factor	MI_CA_SET_STD_DEV_FCTR_NBR	Numeric	The default value is *2*.

Field Caption	Field ID	Data Type (Length)	Comments
Remaining Life Critical Number of TMLs	MI_CA_SET_RM_LIF_CRIT_TMLS_NBR	Numeric	The default value is *1*. Enter a value between 0 and 1.
Corrosion Rate Options - Least Squares	MI_CA_SET_CR_OPT_LS_FLG	Boolean	Enter *True* or *False*. The default value is *False*.
Corrosion Rate Options - Short Term	MI_CA_SET_CR_OPT_ST_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Corrosion Rate Options - Long Term	MI_CA_SET_CR_OPT_LT_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Corrosion Rate Options - Custom A	MI_CA_SET_CR_OPT_A_F	Boolean	Enter *True* or *False*. The default value is *False*.
Corrosion Rate Options - Custom B	MI_CA_SET_CR_OPT_B_F	Boolean	Enter *True* or *False*. The default value is *False*.
Default Inspection Interval (Months)	MI_CA_SET_INSP_INTRVL_NBR	Numeric	The default value is *0*.

Field Caption	Field ID	Data Type (Length)	Comments
Inspection Interval Options - Factor Remaining Life	MI_CA_SET_INSP_INT_OPT_FRL_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Inspection Interval Options - Inspection Interval	MI_CA_SET_INSP_INT_OPT_II_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Default T-Min (Inches)	MI_CA_SET_REF_TMIN_NBR	Numeric	The default value is *0*.
Minimum Corrosion Rate (Mils/year)	MI_CA_SET_MN_CR_NBR	Numeric	The default value is *5*.
Use Minimum Corrosion Rate	MI_CA_SET_USE_MN_CR_FLG	Boolean	Enter *True* or *False*. The default value is *False*.
Remaining Life Factor	MI_CA_SET_REM_LIFE_FCTR_NBR	Numeric	The default value is *0.5*. Enter a number between 0 and 1.
Allowable Measurement Variance (inches)	MI_CA_SET_ALLOW_VARIA_NBR	Numeric	The default value is *0*.

Field Caption	Field ID	Data Type (Length)	Comments
Corrosion Rate Variance	MI_CA_SET_CRV_N	Numeric	The default value is *0*.

Functional_Location_CAS Worksheet

On the Functional_Location_CAS worksheet, you will specify Corrosion Analysis Settings records for a Functional Location. If you do not enter values on this worksheet, the default values are used. This worksheet is included only in the Thickness Monitoring (TM) Functional Location Data Loader.

In addition, the values that you enter on this worksheet are used to specify Corrosion Analysis Settings for associated TML Groups and TMLs. You can, however, overwrite these values by specifying different values on the TML_Group_CAS and TML_CAS worksheets respectively.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value.
CMMS System	MI_FNCLOC00_SAP_SYSTEM_C	Character (255)	If the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Inspection Type</td><td>MI_CA_SET_ANALY_TYPE_CHR</td><td>Character (50)</td><td>If you do not enter a value in this cell, then data in this row is not loaded.

In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>System Code ID</th><th>Inspection Type</th></tr><tr><td>UT</td><td>Ultrasonic Thickness</td></tr><tr><td>RT</td><td>Radiographic Thickness</td></tr><tr><td>TML</td><td>Thickness Measurement Location</td></tr></table>
The list in this field is populated by the CITP System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Controlling Corrosion Rate</td><td>MI_CA_SET_CR_ROLL_OPT_CHR</td><td>Character (50)</td><td>This cell may only contain one of the following values:

• Average
• Formula
• Maximum

The default value is Maximum.</td></tr>
<tr><td>Comments</td><td>MI_CA_SET_COM_CON_COR_RAT_CHR</td><td>Character (2500)</td><td>None</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Apply CCR to TML Rem Life Next Insp Date Calc	MI_CA_SET_APPLY_CR_FLG	Boolean	Enter *True* or *False*. The default value is *False*.
Safety Factor	MI_CA_SET_AVG_CR_SFTY_FCTR_NBR	Numeric	The default value is *1*.
Minimum Number of TMLs	MI_CA_SET_AVG_CR_MN_TML_NBR	Numeric	The default value is *1*.
Percentile	MI_CA_SET_AVG_CR_PERC_NBR	Numeric	The default value is *100*.
Std Deviation Factor	MI_CA_SET_STD_DEV_FCTR_NBR	Numeric	The default value is *2*.
Remaining Life Critical Number of TMLs	MI_CA_SET_RM_LIF_CRIT_TMLS_NBR	Numeric	The default value is *1*.
Corrosion Rate Options - Least Squares	MI_CA_SET_CR_OPT_LS_FLG	Boolean	Enter *True* or *False*. The default value is *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Corrosion Rate Options - Short Term	MI_CA_SET_CR_OPT_ST_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Corrosion Rate Options - Long Term	MI_CA_SET_CR_OPT_LT_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Corrosion Rate Options - Custom A	MI_CA_SET_CR_OPT_A_F	Boolean	Enter *True* or *False*. The default value is *False*.
Corrosion Rate Options - Custom B	MI_CA_SET_CR_OPT_B_F	Boolean	Enter *True* or *False*. The default value is *False*.
Default Inspection Interval (Months)	MI_CA_SET_INSP_INTRVL_NBR	Numeric	The default value is *0*.
Inspection Interval Options - Factor Remaining Life	MI_CA_SET_INSP_INT_OPT_FRL_FLG	Boolean	Enter *True* or *False*. The default value is *True*.
Inspection Interval Options - Inspection Interval	MI_CA_SET_INSP_INT_OPT_II_FLG	Boolean	Enter *True* or *False*. The default value is *True*.

Field Caption	Field ID	Data Type (Length)	Comments
Default T-Min (Inches)	MI_CA_SET_REF_TMIN_NBR	Numeric	The default value is *0*.
Minimum Corrosion Rate (Mils/year)	MI_CA_SET_MN_CR_NBR	Numeric	The default value is *5*.
Use Minimum Corrosion Rate	MI_CA_SET_USE_MN_CR_FLG	Boolean	Enter *True* or *False*. The default value is *False*.
Remaining Life Factor	MI_CA_SET_REM_LIFE_FCTR_NBR	Numeric	The default value is *0.5*. Enter a number between 0 and 1.
Allowable Measurement Variance (inches)	MI_CA_SET_ALLOW_VARIA_NBR	Numeric	The default value is *0*.
Corrosion Rate Variance	MI_CA_SET_CRV_N	Numeric	The default value is *0*.

TML_Group Worksheet

On the TML_Group worksheet, you will specify the TML groups (which are or will be represented by TML Group records) that you want to create or update.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Equipment Data Loader.

Field Caption	Field ID	Data Type (Length)	Comments
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Functional Location Data Loader.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment or the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	This column appears only in the Thickness Monitoring (TM) Equipment Data Loader. If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.
TML Group ID	MI_TMLGROUP_ID_C	Character (50)	A value is required and must be unique among all the TML Groups linked to an Asset. **Note:** Although the TML Group ID field is disabled and populated automatically in GE Digital APM, you can override the value using the data loader workbook.
Description	MI_TMLGROUP_DESCR_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Corrosion Group	MI_TMLGROUP_CORRO_GROUP_C	Character (255)	None
Comments	MI_TMLGROUP_COMME_T	Character (2500)	None

TML_Group_CAS

On the TML_Group_CAS worksheet, you will specify Corrosion Analysis Settings records for a TML Group. If you do *not* enter values on this worksheet, the values on the Asset_CAS or Functional_Location_CAS worksheet for the associated asset are used. Otherwise, the values that you enter on the TML_Group_CAS are used for the TML Group.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Equipment Data Loader.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Functional Location Data Loader.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment or the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	This column appears only in the Thickness Monitoring (TM) Equipment Data Loader. If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.
Inspection Type	MI_CA_SET_ANALY_TYPE_CHR	Character (50)	If you do not enter a value in this cell, then data in this row is not loaded. This cell may only contain a value that you entered in the Inspection Type cell for the associated asset on the Asset_CAS or Functional_Location_CAS worksheet.
TML Group ID	MI_TMLGROUP_ID_C	Character (50)	A value is required and must match one of the value in the corresponding cell on the TML Group worksheet.
Controlling Corrosion Rate	MI_CA_SET_CR_ROLL_OPT_CHR	Character (50)	This cell may only contain one of the following values: • Average • Formula • Maximum
Comments	MI_CA_SET_COM_CON_COR_RAT_CHR	Character (2000)	None

Field Caption	Field ID	Data Type (Length)	Comments
Apply CCR to TML Rem Life Next Insp Date Calc	MI_CA_SET_APPLY_CR_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Safety Factor	MI_CA_SET_AVG_CR_SFTY_FCTR_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Minimum Number of TMLs	MI_CA_SET_AVG_CR_MN_TML_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Percentile	MI_CA_SET_AVG_CR_PERC_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Std Deviation Factor	MI_CA_SET_STD_DEV_FCTR_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Remaining Life Critical Number of TMLs	MI_CA_SET_RM_LIF_CRIT_TMLS_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Corrosion Rate Options - Least Squares	MI_CA_SET_CR_OPT_LS_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.

Field Caption	Field ID	Data Type (Length)	Comments
Corrosion Rate Options - Short Term	MI_CA_SET_CR_OPT_ST_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Corrosion Rate Options - Long Term	MI_CA_SET_CR_OPT_LT_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Corrosion Rate Options - Custom A	MI_CA_SET_CR_OPT_A_F	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Corrosion Rate Options - Custom B	MI_CA_SET_CR_OPT_B_F	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Default Inspection Interval (Months)	MI_CA_SET_INSP_INTRVL_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Inspection Interval Options - Factor Remaining Life	MI_CA_SET_INSP_INT_OPT_FRL_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.

Field Caption	Field ID	Data Type (Length)	Comments
Inspection Interval Options - Inspection Interval	MI_CA_SET_INSP_INT_OPT_II_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Default T-Min (Inches)	MI_CA_SET_REF_TMIN_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Minimum Corrosion Rate (Mils/year)	MI_CA_SET_MN_CR_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Use Minimum Corrosion Rate	MI_CA_SET_USE_MN_CR_FLG	Boolean	Enter *True* or *False*. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Remaining Life Factor	MI_CA_SET_REM_LIFE_FCTR_NBR	Numeric	Enter a number between 0 and 1. If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Allowable Measurement Variance (inches)	MI_CA_SET_ALLOW_VARIA_NBR	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Corrosion Rate Variance	MI_CA_SET_CRV_N	Numeric	If you do not enter a value in this cell, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.

TML Worksheet

On the TML worksheet, you will specify the TMLs (that are or will be represented by Thickness Measurement Location records) that you want to create. For some of the cells, if you do not enter a value on this worksheet, after you load data, the corresponding fields are populated automatically in GE Digital APM.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Equipment Data Loader.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Functional Location Data Loader.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment or the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	This column appears only in the Thickness Monitoring (TM) Equipment Data Loader. If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.

Field Caption	Field ID	Data Type (Length)	Comments
TML Group ID	MI_TMLGROUP_ID_C	Character (50)	If you do not enter a value in this cell, the TML is directly linked to the Asset.
TML ID	MI_DP_ID_CHR	Character (50)	A value is required, and must be unique among all the TMLs linked to a TML Group or an Asset.
TML Analysis Type	MI_TML_TYPE_CHR	Character (50)	A value is required. This cell may only contain one of the values that you entered in the Inspection Type cell in the Asset_CAS, Functional_Location_CAS, or TML_Group_CAS worksheet, whichever is linked to the TML.
Component Type	MI_TML_COMP_TYPE_CHR	Character (10)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Piping • Pressure Vessel • Tank
Location	MI_DP_LOCTN_CHR	Character (50)	None
ISO Drawing Number	MI_DP_ISO_DRAW_CHR	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Access	MI_DP_ACCESS_CHR	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • LADDER • MANLIFT • SCAFFOLD The list in this field is populated by the DPAC System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Inspection Sequence Number	MI_DP_INSP_SEQ_NBR	Numeric	None
Insulated Flag	MI_TML_INSLTED_FLG	Boolean	Enter *True* or *False*. The default value is *False*.
TML Comment	MI_DP_COMMNT_CHR	Character (255)	None
Minimum Thickness	MI_TML_MIN_THICK_NBR	Numeric	If you do not enter a value in this cell, the value in the Default T-Min (Inches) cell on the TML_CAS worksheet is used.
Additional Thickness	MI_THICK_MEASU_LOCAT_ADDIT_THI	Numeric	None

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Excluded From Analysis</td><td>MI_DP_EXCL_FROM_ANALYSIS_FLG</td><td>Logical</td><td>Enter True or False. The default value is False.</td></tr>
<tr><td>Number of Readings</td><td>MI_TML_READ_NUM_N</td><td>Numeric</td><td>Enter a number between 1 and 26. The default value is 1.</td></tr>
<tr><td>Design Code</td><td>MI_TML_DSGN_CODE_CHR</td><td>Character (50)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs based on the value in the Component Type cell:<table><tr><th>Component Type</th><th>Design Code</th></tr><tr><td>Piping</td><td>B31.1
B31.3</td></tr><tr><td>Pressure Vessel</td><td>ASME VIII DIV 1</td></tr><tr><td>Tank</td><td>API 653</td></tr></table>The list in this field is populated by the DSCD System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Code Year (T-Min Formula)</td><td>MI_TML_CODE_YEAR_C</td><td>Character (4)</td><td>A value is required if the value in the Design Code cell is not N/A. This cell may only contains one of the following values:
N/A
1995</td></tr>
<tr><td>Code Year (Allowable Stress Lookup)</td><td>MI_TML_CODE_YEAR_STRESS_C</td><td>Character (4)</td><td>A value is required if the value in the Design Code cell is not N/A. The following table provides the valid values that you can enter in this cell based on the value in the Design Code cell.<table><tr><th>Design Code</th><th>Code Year (Allowable Stress Lookup)</th></tr><tr><td>API 653</td><td>2008</td></tr><tr><td>ASME VIII DIV 1</td><td>1998
2010</td></tr><tr><td>B31.1</td><td>2014</td></tr><tr><td>B31.3</td><td>2014</td></tr></table></td></tr>
<tr><td>Material Specification</td><td>MI_TML_MAT_SPEC_CHR</td><td>Character</td><td>A value is required if the value in the Override Allowable Stress cell is False, and if you want GE Digital APM to calculate T-min values. Refer to the (Picklist) worksheet in the data loader workbook for valid values that you can enter in this cell based on the values in the Design Code and Code Year (Allowable Stress Lookup) cells.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Material Grade	MI_TML_MAT_GRADE_CHR	Character (50)	A value is required if the value in the Override Allowable Stress cell is *False*, and if you want GE Digital APM to calculate T-min values. Refer to the (Picklist) worksheet in the data loader workbook for valid values that you can enter in this cell based on the values in the Design Code, Code Year (Allowable Stress Lookup), and Material Specification cells.
Material Type	MI_TML_MATER_TYPE_CHR	Character	None
Design Pressure	MI_TML_DSGN_PRESS_NBR	Numeric	A value is required if you want GE Digital APM to calculate T-min values.
Design Temperature	MI_TML_DSGN_TEMP_NBR	Numeric	A value is required if you want GE Digital APM to calculate T-min values.
Nominal Thickness	MI_TML_NOM_THICK_NBR	Numeric	None
Override Allowable Stress	MI_TML_OVRD_ALLOW_STRES_F	Boolean	Enter *True* or *False*.
Allowable Stress	MI_TML_ALLOWABLE_STRESS_N	Numeric	A value is required if the value in the Override Allowable Stress cell is *True*, and you want GE Digital APM to calculate T-min values.

Field Caption	Field ID	Data Type (Length)	Comments
Outside Diameter	MI_TML_OUTSD_DIAM_NBR	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Vessel Type cell is *CON_HEAD* (Conical Head), *ELLIP_HEAD* (Ellipsoidal Head), *PIPENOZZ* (Pipe nozzle), *TORCC_HEAD* (Toriconical Head), or *TORCK_HEAD* (Toriconical Head, Knuckle Portion). • The value in the PV Formula cell is *Outside*. • You want GE Digital APM to calculate T-min values.
Inside Diameter	MI_TML_INSD_DIAM_NBR	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Vessel Type cell is *CON_HEAD* (Conical Head), *ELLIP_HEAD* (Ellipsoidal Head), *TORCC_HEAD* (Toriconical Head), or *TORCK_HEAD* (Toriconical Head, Knuckle Portion). • The value in the PV Formula cell is *Inside*. • You want GE Digital APM to calculate T-min values.

Field Caption	Field ID	Data Type (Length)	Comments
Joint Factor	MI_TML_JOINT_EFF_NBR	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *RIVSHELL* (Rivited Shell) or *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values. The default value is *1*.
Corrosion Allowance	MI_TML_CORR_ALLOW_NBR	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Piping Nominal Diameter - NPS	MI_TML_NOM_DIAM_NBR	Numeric	Refer to the (Picklist) worksheet in the data loader workbook for a list of values that you can enter in this cell. The values in the Piping Nominal Diameter - NPS and Piping Nominal Diameter - DN cells are mapped using the Piping Properties reference table. Therefore, if you enter a value in one of these cells, the other field is populated with the mapped value after you load data. If you enter a value that is *not* mapped to the value in the Piping Nominal Diameter - DN cell, then the value in this cell is ignored, and the corresponding field is populated with the value mapped to the value in the Piping Nominal Diameter - DN cell. For example, if the value in the Piping Nominal Diameter - DN cell is 6, then the value in this cell must be 0.125. If you enter a different value in this cell or leave it blank, then the value *0.125* is used to populate the corresponding field in GE Digital APM.
Piping Nominal Diameter - DN	MI_TML_PIPING_NOM_DIAM_DN_N	Numeric	Refer to the (Picklist) worksheet in the data loader workbook for a list of values that you can enter in this cell. The values in the Piping Nominal Diameter - NPS and Piping Nominal Diameter - DN cells are mapped using the Piping Properties reference table. Therefore, if you enter a value in one of these cells, the other field is populated with the mapped value after you load data.

Field Caption	Field ID	Data Type (Length)	Comments
Schedule	MI_TML_SCHED_CHR	Character (50)	A value is required if you have entered a value in the Piping Nominal Diameter - NPS cell. Refer to the (Picklist) worksheet in the data loader workbook for a list of values that you can enter in this cell based on the value in the Piping Nominal Diameter - NPS cell.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Piping Formula</td><td>MI_TML_PIPING_FORMULA_C</td><td>Character (4)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs based on the values in the Design Code cell:
<table><tr><th>Design Code</th><th>Piping Formula</th></tr><tr><td>No value</td><td>A
B
C
D</td></tr><tr><td>B31.3</td><td>A
B
C
D</td></tr><tr><td>Any value other than B31.3</td><td>N/A</td></tr></table>
The list in this field is populated by the PIPFMU System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Mechanical Allowance</td><td>MI_TML_MECH_ALLOWANCE_N</td><td>Numeric</td><td>The default value is 0.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Design Factor	MI_TML_DESIGN_FACTOR_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Component Type cell is *Piping*. • The value in the Design Code cell is *B31.8*. • You want GE Digital APM to calculate T-min values. The default value is *1*.
Temperature Factor	MI_TML_TEMP_FACTOR_N	Numeric	A value is required if the value in the Component Type cell is *Piping*, and if you want GE Digital APM to calculate T-min values. The default value is *1*.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Tank Type</td><td>MI_TML_TANK_TYPE_C</td><td>Character (50)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:
<table><tr><th>System Code ID</th><th>Tank Type</th></tr><tr><td>ANNRING</td><td>Annular Ring</td></tr><tr><td>FLRPLATE</td><td>Floor Plate</td></tr><tr><td>RIVSHELL</td><td>Rivited Shell</td></tr><tr><td>ROOFPLATE</td><td>Roof Plate</td></tr><tr><td>WELDSHELL</td><td>Welded Shell</td></tr></table>
The list in this field is populated by the TNKT System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Shell Type</td><td>MI_TML_SHELL_TYPE_C</td><td>Character (50)</td><td>None</td></tr>
<tr><td>API Method</td><td>MI_TML_API_METHOD_C</td><td>Character (50)</td><td>None</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Plate Thickness	MI_TML_PLATE_THICKNESS_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *ANNRING* (Annular Ring). • You want GE Digital APM to calculate T-min values.
Minimum Yield Strength	MI_TML_MIN_YIELD_STR_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values.
Minimum Tensile Strength	MI_TML_MIN_TENSILE_STR_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values.
Course Height	MI_TML_COURSE_HEIGHT_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Course Number	MI_TML_COURSE_NUMBER_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values.
Fill Height	MI_TML_FILL_HEIGHT_N	Numeric	None
Specific Gravity	MI_TML_SPECIFIC_GRAVITY_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *ANNRING* (Annular Ring), *RIVSHELL* (Riveted Shell), or *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values.
Floor Plate has Detection?	MI_TML_FLR_PLATE_DETECTION_L	Boolean	Enter *True* or *False*. The default value is *False*.
Floor Plate has Reinforced Lining?	MI_TML_FLR_PLATE_REINFORCED_LINING_L	Boolean	Enter *True* or *False*. The default value is *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Maximum Operating Fill Height	MI_TML_MAX_OP_FILL_HEIGHT_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *ANNRING* (Annular Ring), *RIVSHELL* (Riveted Shell), or *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values.
Distance From the Bottom	MI_TML_DIST_FROM_BOTT_NBR	Numeric	None
Tank Diameter	MI_TML_TANK_DIAMETER_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Design Code cell is *API 653*. • The value in the Tank Type cell is *ANNRING* (Annular Ring), *RIVSHELL* (Riveted Shell), or *WELDSHELL* (Welded Shell). • You want GE Digital APM to calculate T-min values.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Vessel Type</td><td>MI_TML_VESSEL_TYPE_C</td><td>Character (50)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:
<table><tr><th>System Code ID</th><th>Tank Type</th></tr><tr><td>CON_HEAD</td><td>Conical Head</td></tr><tr><td>CYL_SHELL</td><td>Cylindrical Shell</td></tr><tr><td>ELLIP_HEAD</td><td>Ellipsoidal Head</td></tr><tr><td>HEM_HEAD</td><td>Hemispherical Head</td></tr><tr><td>PIPENOZZ</td><td>Pipe Nozzle</td></tr><tr><td>SPH_SHELL</td><td>Spherical Shell</td></tr><tr><td>TORCC_HEAD</td><td>Toriconical Head</td></tr><tr><td>TORCK_HEAD</td><td>Toriconical Head, Knuckle Portion</td></tr><tr><td>TORSP_HEAD</td><td>Torispherical Head</td></tr></table>
The list in this field is populated by the VSTP System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
PV Formula	MI_TML_PV_FORMULA_C	Character (10)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Inside • Outside The list in this field is populated by the PVFMU System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Dish Radius	MI_TML_DISH_RADIUS_N	Numeric	A value is required if: • The value in the Vessel Type cell is *TORSP_HEAD* (Torispherical Head). -and- • You want GE Digital APM to calculate T-min values.
Knuckle Radius	MI_TML_KNUCKLE_RADIUS_N	Numeric	A value is required if: • The value in the Vessel Type cell is *TORCK_HEAD* (Toriconical Head, Knuckle Portion) or *TORSP_HEAD* (Torispherical Head). -and- • You want GE Digital APM to calculate T-min values.

Field Caption	Field ID	Data Type (Length)	Comments
apex_angle	MI_TML_APEX_ANGLE_N	Numeric	A value is required if: • The value in the Vessel Type cell is *CON_HEAD* (Conical Head), *TORCC_HEAD* Toriconical Head), or *TORCK_HEAD* (Toriconical Head, Knuckle Portion). -and- • You want GE Digital APM to calculate T-min values.
Inside Radius	MI_TML_INSIDE_RADIUS_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Vessel Type cell is *CYL_SHELL* (Cylindrical Shell), *HEM_HEAD* Hemispherical Head), or *SPH_SHELL* (Spherical Shell). • The value in the PV Formula cell is *Inside*. • You want GE Digital APM to calculate T-min values.
Outside Radius	MI_TML_OUTSIDE_RADIUS_N	Numeric	A value is required if all of the following conditions are satisfied: • The value in the Vessel Type cell is *CYL_SHELL (Cylindrical Shell)*, *HEM_HEAD* Hemispherical Head), or *SPH_SHELL* (Spherical Shell). • The value in the PV Formula cell is *Outside*. • You want GE Digital APM to calculate T-min values.

Field Caption	Field ID	Data Type (Length)	Comments
Head Diameter	MI_TML_HEAD_DIAMETER_N	Numeric	None

TML_CAS Worksheet

On the TML_CAS worksheet, you will specify Corrosion Analysis Settings records for a TML.

- If you do *not* enter values on this worksheet, and:
  - If the TML is linked to a TML Group, then the values on the TML_Group_CAS worksheet for the associated TML Group are used.
  - If the TML is *not* linked to a TML Group, the values that you enter on the Asset_CAS or Functional_Location_CAS worksheet are used.
- Otherwise, the values on the TML_CAS worksheet are used.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Equipment Data Loader.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Functional Location Data Loader.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment or the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	This column appears only in the Thickness Monitoring (TM) Equipment Data Loader. If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.
Inspection Type	MI_CA_SET_ANALY_TYPE_CHR	Character (50)	If you do not enter a value in this cell, then data in this row is not loaded. If the TML is linked to a TML Group, then this cell may only contain a value that you have entered in the Inspection Type cell for the associated *TML Group* on the *TML_Group_CAS* worksheet. Otherwise, this cell may only contain a value that you have entered in the Inspection Type cell for the associated *asset* on the *Asset_CAS* worksheet.
TML Group ID	MI_TMLGROUP_ID_C	Character (50)	A value is required if the TML is linked to a TML Group. The value should match the value in the TML Group ID cell for the corresponding TML on the TML worksheet. If you do not enter a value in this cell, the TML is directly linked to the Asset.
TML ID	MI_DP_ID_CHR	Character (50)	A value is required and must be unique.

Field Caption	Field ID	Data Type (Length)	Comments
Std Deviation Factor	MI_CA_SET_STD_DEV_FCTR_NBR	Numeric	If you do not enter a value in this cell, and if the TML is linked to a TML Group, then the value in the corresponding cell on the TML_Group_CAS worksheet is used. Otherwise, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Default Inspection Interval (Months)	MI_CA_SET_INSP_INTRVL_NBR	Numeric	If you do not enter a value in this cell, and if the TML is linked to a TML Group, then the value in the corresponding cell on the TML_Group_CAS worksheet is used. Otherwise, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Minimum Corrosion Rate (Mils/year)	MI_CA_SET_MN_CR_NBR	Numeric	If you do not enter a value in this cell, and if the TML is linked to a TML Group, then the value in the corresponding cell on the TML_Group_CAS worksheet is used. Otherwise, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.
Allowable Measurement Variance (inches)	MI_CA_SET_ALLOW_VARIA_NBR	Numeric	If you do not enter a value in this cell, and if the TML is linked to a TML Group, then the value in the corresponding cell on the TML_Group_CAS worksheet is used. Otherwise, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.

Field Caption	Field ID	Data Type (Length)	Comments
Corrosion Rate Variance	MI_CA_SET_CRV_N	Numeric	If you do not enter a value in this cell, and if the TML is linked to a TML Group, then the value in the corresponding cell on the TML_Group_CAS worksheet is used. Otherwise, the value in the corresponding cell on the Asset_CAS or the Functional_Location_CAS worksheet is used.

Measurements Worksheet

On the Measurements worksheet, you will specify the TMs (that are or will be represented by Thickness Measurement records) that you want to create or update.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment ID	MI_EQUIP000_EQUIP_ID_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Equipment Data Loader.
Functional Location ID	MI_FNCLOC00_FNC_LOC_C	Character (255)	This column requires at least one cell to have a value. This column appears only in the Thickness Monitoring (TM) Functional Location Data Loader.
CMMS System	MI_EQUIP000_SAP_SYSTEM_C	Character (255)	If the Equipment or the Functional Location record for an asset has a value in the CMMS System field, enter that value in this column.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	This column appears only in the Thickness Monitoring (TM) Equipment Data Loader. If you are required to enter a value for the CMMS System cell for an asset, and the Equipment record for the asset has a value in the Equipment Technical Number field, enter that value in this column. If there is no value in the CMMS System field, this column can be blank, even if the Equipment record contains a value for the Equipment Technical Number field.
TML Group ID	MI_TMLGROUP_ID_C	Character (50)	A value is required if the corresponding TML is linked to a TML Group. The value that you enter must match the value in the TML Group ID cell for the corresponding TML on the TML worksheet.
TML ID	MI_DP_ID_CHR	Character (50)	A value is required and should match the value in the TML ID cell for the corresponding TML on the TML worksheet. Otherwise, data in this row is not loaded.
Readings	MI_THICK_MEASU_READI_C	Character (2000)	A value is required. Enter a number greater than 0. If you have multiple readings, separate them with semicolons. If you do not enter a value in this cell, the data in this row is not loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Measurement Date	MI_DP_MEAS_TAKEN_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss If you do not enter a value, the current date is used.
Measurement Taken By	MI_DP_MEAS_TAKEN_BY_CHR	Character	Enter a value in the following format: <Last Name>, <First Name> ~ <User ID> When you want to *create* a Thickness Monitoring record using the data loader workbook, and if your user ID appears in the Measurement Taken By field on a Thickness Measurement datasheet, then you need not enter a value in this cell. The appropriate value is automatically populated in the Measurement Taken By field after you load data. If not, enter a value that matches the user ID of a Security User in GE Digital APM. Otherwise, the data in this row is not loaded. If, however, you do *not* want the Measurement Taken by field to be populated automatically, using the data loader workbook, *update* the Thickness Monitoring record by leaving the Measurement Taken By cell blank.
Measurement Comment	MI_DP_MEAS_COMMENT_CHR	Character (255)	None
Temperature	MI_THICK_MEAS_TEMP_TAKEN_AT_N	Numeric	None

About the Thickness Monitoring (TM) Data Loaders Load Verification

After you load data, perform the following steps in GE Digital APM to confirm the integrity and accuracy of the data that you have loaded:

- Access the details of the import job. These details indicate if any errors were encountered during the data load. The log may help account for any records that are not loaded.
- In Thickness Monitoring or Record Manager, access the assets specified in the data loader workbook, and then verify that the expected TML Groups and TMLs are present or updated, and that any associated records that you expected to be created are also present in the database.
- To view a list of TML Groups created after a specific date, run the following query:
  - For an SQL database:

```
SELECT [MI_TMLGROUP].[MI_TMLGROUP_ID_C] "TML Group ID", [MI_TMLGROUP].
[MI_TMLGROUP_DESCR_C] "Description", [MI_TMLGROUP].LAST_UPDT_DT "LAST_
UPDT_DT" FROM [MI_TMLGROUP] WHERE [MI_TMLGROUP].LAST_UPDT_DT >= CONVERT
(VARCHAR(255), (? :d :caption='Enter a Date'), 110)
```

  - For an Oracle database:

```
SELECT [MI_TMLGROUP].[MI_TMLGROUP_ID_C] "TML Group ID", [MI_TMLGROUP].
[MI_TMLGROUP_DESCR_C] "Description", [MI_TMLGROUP].LAST_UPDT_DT "LAST_
UPDT_DT", [MI_TMLGROUP].ENTY_ID "ENTY_ID" FROM [MI_TMLGROUP] WHERE [MI_
TMLGROUP].LAST_UPDT_DT >= to_date(to_char((? :d :caption='Enter a Date'),
'mm/dd/yyyy'), 'mm/dd/yyyy')
```

- To view a list of TMLs created after a specific date, run the following query:
  - For an SQL database:

```
SELECT [MI Thickness Measurement Location].[MI_DP_ID_CHR] "TML ID", [MI
Thickness Measurement Location].[MI_DP_ASSET_ID_CHR] "TML Asset ID", [MI
Thickness Measurement Location].LAST_UPDT_DT "LAST_UPDT_DT" FROM [MI
Thickness Measurement Location] WHERE [MI Thickness Measurement Loca-
tion].LAST_UPDT_DT >= CONVERT(VARCHAR(255), (? :d :caption='Enter a
Date'), 110)
```

  - For an Oracle database:

```
SELECT [MI Thickness Measurement Location].[MI_DP_ID_CHR] "TML ID", [MI
Thickness Measurement Location].[MI_DP_ASSET_ID_CHR] "TML Asset ID", [MI
Thickness Measurement Location].LAST_UPDT_DT "LAST_UPDT_DT", [MI Thick-
ness Measurement Location].ENTY_KEY "ENTY_KEY" FROM [MI Thickness Meas-
urement Location] WHERE [MI Thickness Measurement Location].LAST_UPDT_DT
>= to_date(to_char((? :d :caption='Enter a Date'), 'mm/dd/yyyy'), 'mm/d-
d/yyyy')
```


- To view a list of Thickness Measurements created after a specific date, run the following query:
  - For an SQL database:

```
SELECT [MI Thickness Measurement].[MI_THICK_MEASU_ID_CHR] "Measurement
ID", [MI Thickness Measurement].[MI_DP_MEAS_TAKEN_BY_CHR] "Measurement
Taken By", [MI Thickness Measurement].[MI_THICK_MEAS_TML_KEY_C] "TML
Key", [MI Thickness Measurement].LAST_UPDT_DT "LAST_UPDT_DT" FROM [MI
Thickness Measurement] WHERE [MI Thickness Measurement].LAST_UPDT_DT >=
CONVERT(VARCHAR(255), (? :d :caption='Enter a Date'), 110)
```

  - For an Oracle database:

```
SELECT [MI Thickness Measurement].[MI_THICK_MEASU_ID_CHR] "Measurement
ID", [MI Thickness Measurement].[MI_DP_MEAS_TAKEN_BY_CHR] "Measurement
Taken By", [MI Thickness Measurement].[MI_THICK_MEASU_READ_PF_C] "Read-
ings Pass/Fail", [MI Thickness Measurement].[MI_THICK_MEAS_TML_KEY_C]
"TML Key", [MI Thickness Measurement].LAST_UPDT_DT "LAST_UPDT_DT", [MI
Thickness Measurement].ENTY_KEY "ENTY_KEY" FROM [MI Thickness Meas-
urement] WHERE [MI Thickness Measurement].LAST_UPDT_DT >= to_date(to_char
((? :d :caption='Enter a Date'), 'mm/dd/yyyy'), 'mm/dd/yyyy')
```


About the APM Power Generation Data Loaders

This topic provides a list of the APM Power Generation Data Loaders.

About the Generation Availability Analysis (GAA) Data Loaders

GAA provides two data loaders.

- **Generation Availability Analysis (GAA) Amplification Codes Data Loader:** This data loader allows you to import the latest Amplification Codes to the GE Digital APM system to populate the Amplification Codes family.
- **Generation Availability Analysis (GAA) Cause Codes Data Loader:** This data loader allows you to import the latest Cause Codes to the GE Digital APM system to populate the Cause Codes family.

About the GAA Data Loader Requirements

To use the GAA Amplification Codes Data Loader and GAA Cause Codes Data Loader, your organization must have completed the deployment of the Generation Availability Analysis module.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI GAA Administrator Security Group or a Security Role that is associated with this Security Group.

About the GAA Data Loader General Loading Strategy

⚠**IMPORTANT:** When importing Amplification and Cause Codes using the GAA Data Loaders, you must ensure that the latest Amplification and Cause Codes from the corresponding documentation is used.

Limitations

This section documents a list of the limitations for the GAA Data Loaders:

1. You must use the GAA Amplification Codes Data Loader workbook (**Generation Availability Analysis (GAA) Amplification Codes.xlsx**) and the GAA Cause Codes Data Loader workbook (**Generation Availability Analysis (GAA) Cause Code.xlsx**). Any modifications made by the user to the values in column headings in any of the worksheets will not be imported.

   Note: Any column values in a customized format will not be imported by the GAA Amplification Codes Data Loader and the GAA Cause Codes Data Loader.

2. If the user imports the same data multiple times, the most recently imported data is included in the database. If a record currently resides in the database and is then reimported, the newly imported file will replace the existing file in the database. The GAA Data Loader does not append the existing record.

About the Generation Availability Analysis (GAA) Data Loader Workbooks Layout and Use

To import Amplification and Cause codes, GE Digital provides the GAA Amplification Codes Data Loader workbook (**Generation Availability Analysis (GAA) Amplification Codes.xlsx**) and the GAA Cause Codes Data Loader workbook (**Generation Availability Analysis (GAA) Cause Code.xlsx**). These workbooks support baseline GAA in GE Digital APM. You must use these workbooks to load Amplification Codes and Cause Codes respectively.

GAA Amplification Codes Data Loader

The following table lists the worksheets that are included in the **Generation Availability Analysis (GAA) Amplification Codes.xlsx** workbook:

Worksheet	Description
Configuration Worksheet	The Configuration worksheet is needed to describe the type of data that you will be loading and how that data should be handled during the data load.
AmplificationCodes Worksheet	The AmplificationCodes Worksheet is used to import the latest Amplification Codes to the GE Digital APM system to populate the Amplification Code family.

Configuration Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Data Worksheet ID	DATA_WORKSHEET_ID	Character	This column contains the name of the **<data>** worksheet where the actual data is located. It needs to have the same name as the **<data>** worksheet in the data loader workbook.

Field Caption	Field ID	Data Type (Length)	Comments
Batch Size	BATCH_SIZE	Character	Modifying this field is required to determine the number of records processed in each batch. Enter the batch size you want, and the Data Loader will process that many records per batch. For example, if you want to use a batch size of 100, enter 100, and the data loader will process 100 records per batch. **Note:** The recommended batch size is 100. If the **Batch Size** column is removed from the source workbook, the data loader will default to a batch size of 100. In addition to processing the data in batches, the log file reports progress by batch.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Family ID	PRIMARY_FAMILY_ID	Character	Depending on the type of data that you are working with, this will contain the Relationship Family ID or the Entity Family ID. You can also allow the data in source file to determine the Family ID by encapsulating the Field ID that contains the Family ID data in brackets (<>). For example if in the **<data>** worksheet there is a column with an ID of PRIMARY_FAMILY_ID, where each row contains the corresponding Family ID, then in this column you should put the value of <PRIMARY_FAMILY_ID>. If the Family ID in the GE Digital metadata contains spaces, then you have to use this feature.
Primary Family Key Fields	PRIMARY_FAMILY_KEY_FIELDS	Character	This column contains the Field IDs associated with the Primary Family that are used to uniquely identify a record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. In the case where you are loading data into a relationship, if no keys fields exist or are used, use the <none> constant. If the Primary Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Family Type	FAMILY_TYPE	Character	The value is this column should be *Entity* or *Relationship* depending on the type of data that is being loaded.

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Family ID	PRED_ FAMILY_ID	Character	When the Family Type is Relationship, this column will contain the value of the Entity Family ID that is the predecessor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Predecessor Family ID.
Predecessor Family Key Fields	PRED_ FAMILY_KEY_ FIELDS	Character	This column contains the Field ID or IDs associated with the Predecessor Family that are used to uniquely identify the predecessor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Predecessor Action is ACTION_ INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.
Successor Family ID	SUCC_ FAMILY_ID	Character	When the Family Type is *Relationship*, this column will contain the value of the Entity Family ID that is the successor in the relationship. Otherwise, it should contain the <none> constant. You can also use the data in each of the rows to determine the Successor Family ID.

Field Caption	Field ID	Data Type (Length)	Comments
Successor Family Key Fields	SUCC_FAMILY_KEY_FIELDS	Character	This column contains the Field ID or IDs associated with the Successor Family that are used to uniquely identify the successor record. If more than one field is to be used, then each Field ID needs to be separated by a | (Pipe) character. If the Successor Action is ACTION_INSERTONLY, then no key fields need to be specified, so you can use the <none> constant.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Action	PRIMARY_ACTION	Character	The value in this column will determine the action that will be applied to the Primary Family records. If the Family Type is *Entity*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE Deleting a record and purging a record will both delete the current record, the difference being that the purge action will delete the record and all of the links or relationships tied to that record. The delete action will simple attempt to delete the record, and if it is related to another record, the delete will fail. If The Family Type is *Relationship*, then the possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE

Field Caption	Field ID	Data Type (Length)	Comments
Predecessor Action	PRED_ACTION	Character	The value in this column will determine the action that will be applied to the Predecessor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE
Successor Action	SUCC_ACTION	Character	The value in this column will determine the action that will be applied to the Successor Family records. The possible values are: • ACTION_INSERTONLY • ACTION_INSERTUPDATE • ACTION_UPDATEONLY • ACTION_DELETE • ACTION_PURGE • ACTION_LOCATE If The Family Type is *Entity* then the values needs to be • ACTION_NONE

Field Caption	Field ID	Data Type (Length)	Comments
Insert with Null Values?	OPTION_ INSERT_ON_ NULL	Boolean	When setting field values on a new record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Update with Null Values?	OPTION_ UPDATE_ON_ NULL	Boolean	When setting field values on an existing record, if a value coming across is NULL, the field values will be set to NULL if this option is set to True.
Replace an Existing Link?	OPTION_ REPLACE_ EXISTING_ LINK	Boolean	The Replace Existing Relationship option is used to determine how a relationship is to be maintained by its cardinality definition. For example, the relationship *Location Contains Asset* that is defined in the Configuration Manager. It has a cardinality defined as Zero or One to Zero or One, has a Location LP-2300, and contains the Asset P-2300. If, in the data load, you assign the Asset P-5000 to be contained in the Location LP-2300, and you have set the Replace Existing Link property to True, then the data loader will link P-5000 to LP-2300 and unlink P-2300 from LP-2300. This assumes that P-5000 is not currently linked to another location. The same is true for a relationship that is defined as Zero or One to Zero or Many, or Zero or Many to Zero or One.

Field Caption	Field ID	Data Type (Length)	Comments
Allow Change of Family?	OPTION_ ALLOW_ CHANGE_OF_ FAMILY	Boolean	Allows the data loader to move an entity from one family to another. For example this would allow an entity that is currently assigned to the Centrifugal Pump family to be moved to the Reciprocating Pump family. All relationships will be maintained as long as the family to which the entity is being moved allows the same relationships. **Note:** Because of the extra processing required, by selecting this option, the interface performance will decrease.

AmplificationCodes Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Amplification Code	MI_GADS_AMPL_CODE_AMPL_ CODE_C	Character (50)	This field is required.
Description	MI_GADS_AMPL_CODE_DESC_ C	Character (1000)	This field is required.
Regulatory Organization	MI_GADS_AMP_COD_REG_ REP_ORG_C	Character (50)	This field is required.
Event Type	MI_GADS_AMPL_CODE_EVEN_ TYPE_C	Character (50)	None
Enterprise Support 1 Code	MI_REF_TABLES_ENTER_ SUPPO_1_CODE_CHR	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Enterprise Support 1 Description	MI_REF_TABLES_ENTER_SUPPO_1_DESCR_CHR	Character (50)	None
Enterprise Support 2 Code	MI_REF_TABLES_ENTER_SUPPO_2_CODE_CHR	Character (50)	None
Enterprise Support 2 Description	MI_REF_TABLES_ENTER_SUPPO_2_DESCR_CHR	Character (50)	None
Enterprise Support 3 Code	MI_REF_TABLES_ENTER_SUPPO_3_CODE_CHR	Character (50)	None
Enterprise Support 3 Description	MI_REF_TABLES_ENTER_SUPPO_3_DESCR_CHR	Character (50)	None
Enterprise Support 4 Code	MI_REF_TABLES_ENTER_SUPPO_4_CODE_CHR	Character (50)	None
Enterprise Support 4 Description	MI_REF_TABLES_ENTER_SUPPO_4_DESCR_CHR	Character (50)	None
Enterprise Support 5 Code	MI_REF_TABLES_ENTER_SUPPO_5_CODE_CHR	Character (50)	None
Enterprise Support 5 Description	MI_REF_TABLES_ENTER_SUPPO_5_DESCR_CHR	Character (50)	None
Enterprise Support 6 Code	MI_REF_TABLES_ENTER_SUPPO_6_CODE_CHR	Character (50)	None
Enterprise Support 6 Description	MI_REF_TABLES_ENTER_SUPPO_6_DESCR_CHR	Character (50)	None
Enterprise Support 7 Code	MI_REF_TABLES_ENTER_SUPPO_7_CODE_CHR	Character (50)	None
Enterprise Support 7 Description	MI_REF_TABLES_ENTER_SUPPO_7_DESCR_CHR	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Enterprise Support 8 Code	MI_REF_TABLES_ENTER_SUPPO_8_CODE_CHR	Character (50)	None
Enterprise Support 8 Description	MI_REF_TABLES_ENTER_SUPPO_8_DESCR_CHR	Character (50)	None
Unit Type	MI_GADS_AMPL_CODE_UNIT_TYPE_N	Character (50)	None

GAA Cause Codes Data Loader

The following table lists the worksheet that is included in the **Generation Availability Analysis (GAA) Cause Code.xlsx** workbook:

Worksheet	Description
CauseCode	The CauseCodes worksheet is used to import the latest GADS Cause Codes to the GE Digital APM system to populate the GADS Cause Code family.
Mapped ID	The Mapped to ID worksheet is used to populate values based on your selection in the Regulatory Reporting Organization in the Cause Codes record.
Unique Key	The Unique Key field is populated and must be in a sequential order. This field is required.

CauseCode Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Cause Code	MI_CAUSECODE_CODE_C	Character (5)	This field is required.
Unit Type	MI_CAUSECODE_UNITTYPE	Numeric	This field is required.

Field Caption	Field ID	Data Type (Length)	Comments
Cause Code Description	MI_CAUSECODE_DESC	Character (250)	This field is required.
System	MI_CAUSECODE_SYSTEM	Character (50)	This field is required.
Component	MI_CAUSECODE_COMPONENT	Character (50)	This field is required.
Is OMC Event?	MI_CAUSECODE_OMC	Boolean	For an OMC Event, set this field to TRUE. For a non-OMC Event, this field must be blank.
Regulatory Organization	MI_GMGADCAU_REG_REP_ORG_C	Character (50)	This field is required.

About the GAA Data Loader Load Verification

A successful data import can be verified using one of the following methods:

- On the **Data Loaders** page, view the value in the **Status and Log** column. If the value *Complete* appears in the **Status and Log** column, then the data has been loaded successfully.
- On the **Data Loaders** page, select the hyperlink in the **Job ID** column to access the Interface Log datasheet, and then view the value in the Status field. If the value *Complete* appears in the Status field, then the data has been loaded successfully.
- Navigate to the Primary Event datasheet and view the fields that belong to the GADS Amplification Codes and GADS Cause Codes families. If you can populate the fields using values available in the drop-down lists on this datasheet, then the data has been loaded successfully.

About the APM Safety Data Loaders

This topic provides a list of all the APM Safety Data Loaders.

About the Calibration Management Data Loader

Using the Calibration Data Loader, you can implement Calibration Management when you have calibration data in a legacy system, which is not supported by GE Digital APM. To import data using the Calibration Data Loader, GE Digital APM provides an Excel template, **Calibration_DataLoader.xlsx**, which supports baseline Calibration Management in GE Digital APM. You must export your legacy system so that the data can be used to populate the template. The data from the template will then be imported into GE Digital APM using the Calibration Data Loader.

Note: The Excel template is referred to throughout this documentation as the *data loader workbook*.

The data loader workbook can be used in the following scenarios:

- Loading existing legacy calibration data into GE Digital APM so that you can retain visibility into previous calibration results, compare the results with current and future results, and generate graphs and reports.
- Loading calibration data from a documenting process calibrator that is not supported by GE Digital APM

After importing the data, the Calibration Data Loader creates the following records in GE Digital APM:

- Test Equipment
- Test Equipment Detail
- Calibration Template, Analog
- Calibration Template, Discrete
- Calibration Task
- Calibration, Analog (Calibration Event)
- Calibration, Discrete (Calibration Event)
- Calibration Result
- Calibration Recommendation

Note: This data loader workbook is not backward compatible to earlier versions of GE Digital APM.

About the Calibration Management Data Loader Requirements

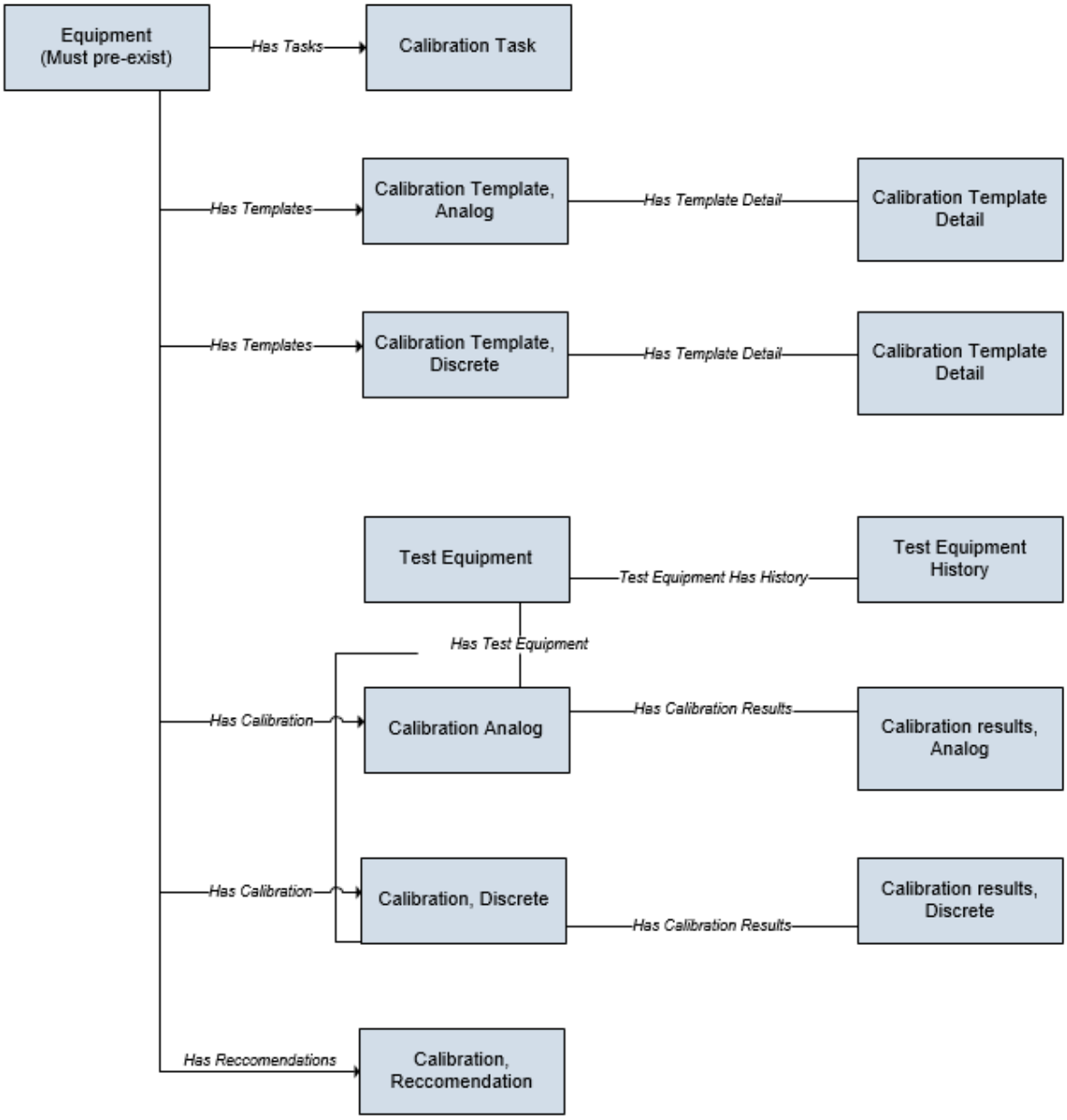
Before importing data using the data loader workbook, you must have completed the deployment of the Calibration Management module. You must also have populated the Equipment to establish relationship with the families in Calibration Management, and have entered a valid Equipment entity key into the data loader workbook. To do this, the Equipment must exist in the GE Digital APM database.

Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

About the Calibration Management Data Loader Data Model

The Calibration Data Loader does not load the entire data model illustrated in the normal help documentation. The following data model illustrates the records that the Data Loader supports. Equipment records, illustrated in green, must exist prior to importing data.



About the Calibration Management Data Loader General Loading Strategy

The imported data must load in a specific sequence in order to successfully populate fields, to create records, and to link them to the predecessor and/or successor records.

Best Practices

When importing data using the data loader workbook, you must use the following best practices:

- ID fields (Row 2 of each worksheet) must not include special characters (other than underscores) or spaces.
- Columns (including columns representing custom fields) in the worksheets should be formatted as Text.
- You should not try to create and update a component in the same data loader workbook.
- You must consider the rules described in the Workbook Layout and Use section of this document while using the Calibration Data Loader.

Load Sequence

When importing data using the data loader workbook, you must use the following workflow:

1. Download the data loader workbook provided by GE Digital
2. Identify the data requirements for exporting the data in to the data loader workbook.
3. Extract data from legacy applications to populate the data loader workbook.
4. Provide batch numbers in the Batch worksheet and in the first column of the remaining worksheets in the data loader workbook.
5. Import data into GE Digital APM.
6. Monitor the status of the data load, and verify the results in the log.
7. Conduct tests in GE Digital APM to ensure that the imported data loaded accurately.

For each row in the data loader workbook, the Calibration Data Loader creates a new record in GE Digital APM. However, if records have already been created and you reimport the data, the existing records will be updated.

About the Calibration Management Data Loader Workbook Layout and Use

To import data using the Calibration Data Loader, GE Digital APM provides the data loader workbook (**Calibration_DataLoader.xlsx**) that supports baseline Calibration Management in GE Digital APM. You must use this workbook to import data. You can modify the workbook to include custom fields used by your organization.

The following table lists the worksheets that are included in the data loader workbook.

Worksheet	Description
Batch	This worksheet is used to define the batches. Data is imported in batches. All the records that are assigned a particular batch number will be imported together. If a record in a batch is not imported, then none of the records in the batch are imported.
MI_TESTEQUIP	This worksheet is used to define Test Equipment records.
MI_TST_EQUIP_HIST	This worksheet is used to define Test Equipment History records.
PROF_TEMPLATES	This worksheet is used to define Calibration Profile Templates records.
MI_CAL_PROF	This worksheet is used to define Calibration Profile records.
MI_TMCAAN00	This worksheet is used to define Calibration Template, Analog records.
MI_TMCADSCT	This worksheet is used to define Calibration Template, Discrete records.
MI_TASKCALB	This worksheet is used to define Calibration Task records.
MI_EVCAANLG	This worksheet is used to define Calibration, Analog records.
MI_CRAN0000	This worksheet is used to define Calibration Results, Analog records.
MI_RECCLBN	This worksheet is used to define Calibration Recommendation records.

Limitations

The Calibration Data Loader has the following limitations:

- You must use the data loader workbook. If you modify the format of the values in columns in any of the worksheets, you will not be able to import data.
- The values that you enter in the data loader workbook are case-sensitive.
- If you reimport data, the records that have been created by the Calibration Data Loader will be *updated*. Therefore, while reimporting data, if you remove the data for a field in the data loader workbook, the value for the corresponding field in GE Digital APM will be blank.

MI_TESTEQUIP Worksheet

The MI_TESTEQUIP worksheet stores the details of the Test Equipment records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Equipment ID	MI_TESTEQUIP_EQUIP_ID_C	Character (50)	A value is required and must be unique. This value identifies the Test Equipment.
Serial Number	MI_TESTEQUIP_SN_C	Numeric	A value is required.
Certification Interval	MI_TESTEQUIP_CERT_INTV_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Certification Units	MI_TESTEQUIP_CERT_UNITS_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Minutes • Hours • Days • Weeks • Months • Years The list in this field is populated by the MI_TIME_UNITS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Model Number	MI_TESTEQUIP_MOD_NO_C	Character (50)	A value is required.
Manufacturer	MI_TESTEQUIP_MFR_C	Character (50)	A value is required.
Last Certification Date	MI_TESTEQUIP_CERT_DATE_D	Date	A value is required. Enter the value in the following format: YYYY-MM-DD HH:mm:ss

Field Caption	Field ID	Data Type (Length)	Comments
Site Reference Name	MI_SITE_NAME	Character (255)	⚠**IMPORTANT:** Site Reference records must preexist in GE Digital APM. The data loader does not create Site Reference records, but simply provides foreign key data in the asset records, as determined in the source workbook. If the site reference record does not preexist, then you will receive an error. A. Enter the site name to designate which site the Test Equipment or Standard Gas Cylinder record, once loaded into GE Digital APM, will be filtered by. -or- B. Enter *Global* to indicate a that the site reference should be left global. Meaning that it will not be filtered by site in GE Digital APM. **Note**: Only super users are permitted to update Site Reference records.
Assigned To	MI_TESTEQUIP_ASSIGNED_TO_C	Character (50)	None
Category	MI_TESTEQUIP_SAP_CATEG_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Certification Supplier is ISO/IEC 17025 Certified	MI_TESTEQUIP_CERT_SUPP_CERT_C	Character (5)	None
Class	MI_TESTEQUIP_SAP_CLASS_C	Character (50)	None
Equipment Technical ID	MI_TESTEQUIP_EQUIP_TECH_NBR_C	Character (50)	None
NIST Traceability Required	MI_TESTEQUIP_NIST_REQD_C	Character (5)	None
Purchase Date	MI_TESTEQUIP_PRCH_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Purchase Order Number	MI_TESTEQUIP_PO_NO_C	Character (50)	None
Type	MI_TESTEQUIP_OBJ_TYP_C	Character (50)	None
Last Check Date	MI_TESTEQUIP_LST_CHK_DATE_D	Date	Enter the value in the following format: YYYY-MM-DD HH:mm:ss

Field Caption	Field ID	Data Type (Length)	Comments
Check Interval	MI_TESTEQUIP_CHECK_INTV_N	Numeric	None
Check Interval Units	MI_TESTEQUIP_CHK_INTV_UNITS_C	Character (50)	This field is required only if the Check Interval field contains a value. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Minutes • Hours • Days • Weeks • Months • Years The list in this field is populated by the MI_TIME_UNITS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Description	MI_TESTEQUIP_DESCR_C	Character (255)	None
Vendor	MI_TESTEQUIP_EQUIP_VNDR_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Maintenance Plant	MI_TESTEQUIP_MAINT_PLANT_C	Character (50)	None

MI_TST_EQUIP_HIST Worksheet

The MI_TST_EQUIP_HIST worksheet stores the details of the Test Equipment History records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Parent ID	MI_TST_EQUIP_HIST_PARE_KEY_N	Character (50)	A value is required. This cell may only contain a value that exists in the list in the Test Equipment ID field for Test Equipment records.
Certification Date	MI_TST_EQUIP_HIST_CERT_DT_D	Date	A value is required. Enter the value in the following format: YYYY-MM-DD HH:mm:ss
Certification Number	MI_TST_EQUIP_HIST_CERT_NUM_C	Character (50)	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Supplier	MI_TST_EQUIP_HIST_SUPPL_C	Character	A value is required.
Entered By	MI_TST_EQUIP_HIST_ENT_BY_C	Character (50)	A value is required.
Date Created	MI_TST_EQUIP_HIST_DATE_C	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss

PROF_TEMPLATES Worksheet

The PROF_TEMPLATES worksheet stores the details of the Calibration Profile Template records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Template ID	MI_TM000000_ID	Character (255)	A value is required and must be unique. This value identifies the Template.

Field Caption	Field ID	Data Type (Length)	Comments
Calibration Family ID	Family_ID	Character (50)	A value is required. Enter the following value: • **For Analog calibration:** MI_TMCAAN00 • **For Discrete calibration:** MI_TMCADSCT
Calibration Type	MI_TMCA0000_CAL_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • ANALOG – MANUAL • SWITCH – MANUAL • FLUKE 74X • ANALYZER – MULTI COMPONENT • ANALYZER – SINGLE COMPONENT • FUNCTIONAL – MANUAL • Druck DPI61x • Druck DPI620 (Genii) The list in this field is populated by the MI_CALIBRATION_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Input Type	MI_TMCA0000_INPUT_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Pressure • Observed • Temperature • Flow • Level • Weight • Voltage • Current • Frequency • Resistance • Other The list in this field is populated by the MI_CALIBRATION_IO_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Output Type	MI_TMCA0000_OUTPU_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Observed • Trip Cont • Trip DVC • Trip AVC • Temperature • Flow • Level • Weight • Voltage • Current • Frequency • Resistance • Other • HART The list in this field is populated by the MI_CALIBRATION_IO_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Max Error Limit	MI_TMCA0000_ERR_LIM_N	Numeric	A value is required.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Primary Input LRV</td><td>MI_TMCA0000_PRI_IN_LRV_N</td><td>Numeric</td><td>A value is required.</td></tr>
<tr><td>Primary Input URV</td><td>MI_TMCA0000_PRI_IN_URV_N</td><td>Numeric</td><td>A value is required.</td></tr>
<tr><td>Primary Input Range Units</td><td>MI_TMCA0000_PRI_IN_RV_UOM_C</td><td>Character (10)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:
<table>
<tr><th>Calibration Type</th><th>System Code Table</th></tr>
<tr><td>Fluke 74x</td><td>UOME</td></tr>
<tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr>
<tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr>
<tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr>
</table></td></tr>
<tr><td>Primary Output LRV (Analog)</td><td>MI_TMCA0000_PRI_OUT_LRV_N</td><td>Numeric</td><td>A value is required.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Primary Output URV (Analog)</td><td>MI_TMCA0000_PRI_OUT_URV_N</td><td>Numeric</td><td>A value is required.</td></tr>
<tr><td>Primary Output Units</td><td>MI_TMCA0000_PRI_OUT_UOM_C</td><td>Character (10)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
<tr><td>SW 1 Setpoint (Discrete)</td><td>MI_TMCA0000_SW1_SP_N</td><td>Numeric</td><td>A value is required.</td></tr>
<tr><td>Activate Switch 1 (Discrete)</td><td>MI_TMCA0000_SPEC_INC_DEC_01_C</td><td>Numeric</td><td>A value is required.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
SW 1 Contact State	MI_TMCA0000_SW1_CNTCT_ST_C	Numeric	A value is required. This field contains the following baseline values: • Normally Open (0) • Normally Closed (1) This field is enabled only when a value exists in the **Calibration Strategy** field.
Reset Set Point	MI_TMCA0000_RESET_SET_POINT_N	Numeric	A value is required.
Ramp Time	MI_TMCA0000_RAMP_TIME_N	Numeric	A value is required.
Repeat Count	MI_TMCA0000_REP_COUNT_N	Numeric	A value is required.
Is Master Template	MI_TMCA0000_IS_MAST_TEMP_L	Boolean	This field is populated with one of the following values: • For profile templates, this field is set to *True*. • For applied templates, this field is set to *False*.

Field Caption	Field ID	Data Type (Length)	Comments
Template State	MI_TM000000_STATE_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • DEVELOPMENT • APPROVED • OBSOLETE The list in this field is populated by the Calibration Template Status value in the MI_STATUS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Loop Power	MI_TMCA0000_LOOP_PWR_C	Character (15)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Disabled • Enabled 24V • Enabled 28V The list in this field is populated by the Fluke Power Source value in the MI_CALIBRATION_REFERENCES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Manual Entered Input Values	MI_TMCA0000_IN_MEV_L	Boolean	Enter *TRUE* or *FALSE*.
Manual Entered Output Values	MI_TMCA0000_OUT_MEV_FLG	Boolean	Enter *TRUE* or *FALSE*.
Performs Square Root	MI_TMCA0000_PERF_SQRT_C	Character (1)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration M
Enable Automated Calibrations	MI_TMCA0000_ENABL_AUTO_CAL_F	Boolean	Enter *TRUE* or *FALSE*.
Custom Input Lower Range Value	MI_TMCA0000_CUST_IN_LRV_N	Numeric	None
Custom Input Upper Range Value	MI_TMCA0000_CUST_IN_URV_N	Numeric	None

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Custom Output Lower Range Value</td><td>MI_TMCA0000_CUST_OUT_LRV_N</td><td>Numeric</td><td>None</td></tr>
<tr><td>Custom Output Upper Range Value</td><td>MI_TMCA0000_CUST_OUT_URV_N</td><td>Numeric</td><td>None</td></tr>
<tr><td>Custom Input Range UOM</td><td>MI_TMCA0000_CUST_IN_RN_UOM_C</td><td>Character (50)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Custom Output Range UOM</td><td>MI_TMCA0000_CUST_OUT_RN_UOM_C</td><td>Character (50)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
<tr><td>TC Linear</td><td>MI_TMCA0000_TC_LIN_F</td><td>Boolean</td><td>Enter TRUE or FALSE.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
RTD Wiring Configuration	MI_TMCA0000_RTD_WIR_CNFG_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • 2 Wire RTD • 3 Wire RTD • 4 Wire RTD • 2 Wire Ohms • 3 Wire Ohms • 4 Wire Ohms The list in this field is populated by the RTD Wiring Configuration value in the MI_CALIBRATION_REFERENCES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Linear TC LRV	MI_TMCA0000_LIN_TC_LRV_N	Numeric	None
Linear TC URV	MI_TMCA0000_LIN_TC_URV_N	Numeric	None
Custom Output Values	MI_TMCA0000_CUST_OUT_VAL_F	Boolean	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
Custom Input Values	MI_TMCA0000_CUST_IN_VAL_F	Boolean	Enter *TRUE* or *FALSE*.
Temperature Element Type	MI_TMCA0000_TMP_EL_TP_C	Character (50)	The list in this field is populated by the following values in the MI_CALIBRATION_REFERENCES System Code Table: • FLUKE TC TYPE • FLUKE RTD TYPE • GE DRUCK TC TYPE • GE DRUCK RTD TYPE If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Error Assessment	MI_TMCA0000_ERR_ASSES_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Percent of Range • Engineering Units The list in this field is populated by the MI_CALIBRATION_ERROR_ASSESSMENT System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

MI_CAL_PROF Worksheet

The MI_CAL_PROF worksheet stores the details of the Calibration Profile records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Profile ID	MI_CAL_PROF_PROF_ID_CHR	Character (255)	A value is required and must be unique. This value identifies the Calibration Profile.
Device Type	MI_CAL_PROF_DEVI_TYPE_C	Character (255)	A value is required.
Profile Template	MI_CAL_PROF_PROF_TEMP_CHR	Character (50)	A value is required.
Calibration Strategy	MI_CAL_PROF_CALI_STRA_C	Character (50)	A value is required. This list is populated by the MI_CALIBRATION_STRATEGIES System Code Table.
Profile Template Family ID	MI_CAL_PROF_TEMP_FMLY_ID_CHR	Character (50)	A value is required. Enter the following value: • **For Analog calibration:** MI_TMCAAN00 • **For Discrete calibration:** MI_TMCADSCT

MI_TMCAAN00 Worksheet

The MI_TMCAAN00 worksheet stores the details of the Calibration Template, Analog records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Template ID	MI_TM000000_ID	Character (255)	A value is required and must be unique. This value identifies the Template. After importing the data, the value in this field (in the corresponding record in GE Digital APM) will be updated to include the values in the following fields: • Equipment Technical Number • Calibration Type • Calibration Strategy • Primary Input Range Units • Primary Output Range Units

Field Caption	Field ID	Data Type (Length)	Comments
Input Type	MI_TMCA0000_INPUT_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Pressure • Observed • Temperature • Flow • Level • Weight • Voltage • Current • Frequency • Resistance • Other The list in this field is populated by the MI_CALIBRATION_IO_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Output Type	MI_TMCA0000_OUTPU_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Temperature • Observed • Flow • Level • Weight • Voltage • Current • Frequency • Resistance • Other • HART The list in this field is populated by the MI_CALIBRATION_IO_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Max Error Limit	MI_TMCA0000_ERR_LIM_N	Numeric	A value is required.
Primary Input LRV	MI_TMCA0000_PRI_IN_LRV_N	Numeric	A value is required.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Primary Input URV</td><td>MI_TMCA0000_PRI_IN_URV_N</td><td>Numeric</td><td>A value is required.</td></tr>
<tr><td>Primary Input Range Units</td><td>MI_TMCA0000_PRI_IN_RV_UOM_C</td><td>Character (10)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
<tr><td>Primary Output LRV</td><td>MI_TMCA0000_PRI_OUT_LRV_N</td><td>Numeric</td><td>A value is required only for the following calibration templates:
Analog Calibration
Single Component Analyzer
Weight Scale Calibration</td></tr>
<tr><td>Primary Output URV</td><td>MI_TMCA0000_PRI_OUT_URV_N</td><td>Numeric</td><td>A value is required.</td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Primary Output Units</td><td>MI_TMCA0000_PRI_OUT_UOM_C</td><td>Character (10)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
<tr><td>Asset Key</td><td>MI_TMCA0000_ASSET_KEY_N</td><td>Numeric</td><td>A value is required. Enter the Equipment Technical Number that corresponds to the Equipment that is linked to the Calibration Template. If the value that you enter does not match the Equipment Technical ID of any Equipment in the GE Digital APM database, an error message appears, stating that the Asset is not found, and the batch is not imported.</td></tr>
<tr><td>Calibration Task ID</td><td>MI_TMCA0000_CAL_TSK_ID_C</td><td>Character (50)</td><td>A value is required. This cell may contain a value that exists in the list in the Task ID field for Calibration Task records.

If the value that you enter does not match the Task ID of any Calibration Task in the GE Digital APM database, then this field is blank.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Asset Family Key	MI_TMCA0000_ASSET_FAM_KEY_N	Numeric	A value is required. If the Asset corresponds to an Equipment record, then enter: MI_EQUIP000
Profile ID	MI_CAL_PROF_PROF_ID_CHR	Character (255)	A value is required and must be unique. This value identifies the Calibration Profile. **Note:** The Profile ID will add a relationship between this Applied Template and the Profile.
Template State	MI_TM000000_STATE_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • DEVELOPMENT • APPROVED • OBSOLETE The list in this field is populated by the Calibration Template Status value in the MI_STATUS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Loop Power	MI_TMCA0000_LOOP_PWR_C	Character (15)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Disabled • Enabled 24V • Enabled 28V The list in this field is populated by the Fluke Power Source value in the MI_CALIBRATION_REFERENCES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Manual Entered Input Values	MI_TMCA0000_IN_MEV_L	Boolean	Enter *TRUE* or *FALSE*.
Manual Entered Output Values	MI_TMCA0000_OUT_MEV_FLG	Boolean	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
Performs Square Root	MI_TMCA0000_PERF_SQRT_C	Character (1)	In the baselineGE Digital APM system, this cell may only contain one of the following System Code IDs: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration M
Enable Automated Calibrations	MI_TMCA0000_ENABL_AUTO_CAL_F	Boolean	Enter *TRUE* or *FALSE*.
Custom Input Lower Range Value	MI_TMCA0000_CUST_IN_LRV_N	Numeric	None
Custom Input Upper Range Value	MI_TMCA0000_CUST_IN_URV_N	Numeric	None
Custom Output Lower Range Value	MI_TMCA0000_CUST_OUT_LRV_N	Numeric	None

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Custom Output Upper Range Value</td><td>MI_TMCA0000_CUST_OUT_URV_N</td><td>Numeric</td><td>None</td></tr>
<tr><td>Custom Input Range UOM</td><td>MI_TMCA0000_CUST_IN_RN_UOM_C</td><td>Character (50)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Custom Output Range UOM</td><td>MI_TMCA0000_CUST_OUT_RN_UOM_C</td><td>Character (50)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
<tr><td>TC Linear</td><td>MI_TMCA0000_TC_LIN_F</td><td>Boolean</td><td>Enter TRUE or FALSE.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
RTD Wiring Configuration	MI_TMCA0000_RTD_WIR_CNFG_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • 2 Wire RTD • 3 Wire RTD • 4 Wire RTD • 2 Wire Ohms • 3 Wire Ohms • 4 Wire Ohms The list in this field is populated by the RTD Wiring Configuration value in the MI_CALIBRATION_REFERENCES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Linear TC LRV	MI_TMCA0000_LIN_TC_LRV_N	Numeric	None
Linear TC URV	MI_TMCA0000_LIN_TC_URV_N	Numeric	None
Custom Output Values	MI_TMCA0000_CUST_OUT_VAL_F	Boolean	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
Custom Input Values	MI_TMCA0000_CUST_IN_VAL_F	Boolean	Enter *TRUE* or *FALSE*.
Temperature Element Type	MI_TMCA0000_TMP_EL_TP_C	Character (50)	The list in this field is populated by the following values in the MI_CALIBRATION_REFERENCES System Code Table: • FLUKE TC TYPE • FLUKE RTD TYPE • GE DRUCK TC TYPE • GE DRUCK RTD TYPE If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Error Assessment	MI_TMCA0000_ERR_ASSES_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Percent of Range • Engineering Units The list in this field is populated by the MI_CALIBRATION_ERROR_ASSESSMENT System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

MI_TMCADSCT Worksheet

The MI_TMCAAN00 worksheet stores the details of the Calibration Template, Discrete

records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Template ID	MI_TM000000_ID	Character (255)	A value is required and must be unique. This value identifies the Template. After importing the data, the value in this field (in the corresponding record in GE Digital APM) will be updated to include the values in the following fields: • Equipment Technical Number • Calibration Type • Calibration Strategy • Primary Input Range Units

Field Caption	Field ID	Data Type (Length)	Comments
Input Type	MI_TMCA0000_INPUT_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Pressure • Observed • Temperature • Flow • Level • Weight • Voltage • Current • Frequency • Resistance • Other The list in this field is populated by the MI_CALIBRATION_IO_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Output Type	MI_TMCA0000_OUTPU_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Temperature • Observed • Trip DVC • Trip AVC • Trip Cont • Flow • Level • Weight • Voltage • Current • Frequency • Resistance • Other • HART The list in this field is populated by the MI_CALIBRATION_IO_TYPES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Max Error Limit	MI_TMCA0000_ERR_LIM_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Input LRV	MI_TMCA0000_PRI_IN_LRV_N	Numeric	A value is required.
Primary Input URV	Primary Input URV	Primary Input URV	Primary Input URV
Primary Input Range Units	MI_TMCA0000_PRI_IN_RV_UOM_C	Character (10)	A value is required.
SW 1 Set-point	MI_TMCA0000_SW1_SP_N	Numeric	A value is required.
Activate Switch 1	MI_TMCA0000_SPEC_INC_DEC_01_C	Numeric	A value is required.
SW 1 Contact State	MI_TMCA0000_SW1_CNTCT_ST_C	Numeric	A value is required. This field contains the following baseline values: • Normally Open (0) • Normally Closed (1) This field is enabled only when a value exists in the **Calibration Strategy** field.
Reset Set Point	MI_TMCA0000_RESET_SET_POINT_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Ramp Time	MI_TMCA0000_RAMP_TIME_N	Numeric	A value is required.
Repeat Count	MI_TMCA0000_REP_COUNT_N	Numeric	A value is required.
Asset Key	MI_TMCA0000_ASSET_KEY_N	Numeric	A value is required. Enter the Equipment Technical Number that corresponds to the Equipment that is linked to the Calibration Template. If the value that you enter does not match the Equipment Technical ID of any Equipment in the GE Digital APM database, an error message appears, stating that the Asset is not found, and the batch is not imported.
Calibration Task ID	MI_TMCA0000_CAL_TSK_ID_C	Character (50)	A value is required. This cell may contain a value that exists in the list in the Task ID field for Calibration Task records. If the value that you enter does not match the Task ID of any Calibration Task in the GE Digital APM database, then this field is blank.
Asset Family Key	MI_TMCA0000_ASSET_FAM_KEY_N	Numeric	A value is required. If the Asset corresponds to an Equipment record, then enter: MI_EQUIP000

Field Caption	Field ID	Data Type (Length)	Comments
Profile ID	MI_CAL_PROF_PROF_ID_CHR	Character (255)	A value is required and must be unique. This value identifies the Calibration Profile. **Note:** The Profile ID will add a relationship between this Applied Template and the Profile.
Template State	MI_TM000000_STATE_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • DEVELOPMENT • APPROVED • OBSOLETE The list in this field is populated by the Calibration Template Status value in the MI_STATUS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Loop Power	MI_TMCA0000_LOOP_PWR_C	Character (15)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Disabled • Enabled 24V • Enabled 28V The list in this field is populated by the Fluke Power Source value in the MI_CALIBRATION_REFERENCES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Manual Entered Input Values	MI_TMCA0000_IN_MEV_L	Boolean	Enter *TRUE* or *FALSE*.
Manual Entered Output Values	MI_TMCA0000_OUT_MEV_FLG	Boolean	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
Performs Square Root	MI_TMCA0000_PERF_SQRT_C	Character (1)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Y • N The list in this field is populated by the MI_YES_NO System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration M
Enable Automated Calibrations	MI_TMCA0000_ENABL_AUTO_CAL_F	Boolean	Enter *TRUE* or *FALSE*.
Custom Input Lower Range Value	MI_TMCA0000_CUST_IN_LRV_N	Numeric	None
Custom Input Upper Range Value	MI_TMCA0000_CUST_IN_URV_N	Numeric	None
Custom Output Lower Range Value	MI_TMCA0000_CUST_OUT_LRV_N	Numeric	None

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Custom Output Upper Range Value</td><td>MI_TMCA0000_CUST_OUT_URV_N</td><td>Numeric</td><td>None</td></tr>
<tr><td>Custom Input Range UOM</td><td>MI_TMCA0000_CUST_IN_RN_UOM_C</td><td>Character (50)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
</table>

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Custom Output Range UOM</td><td>MI_TMCA0000_CUST_OUT_RN_UOM_C</td><td>Character (50)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
<tr><td>TC Linear</td><td>MI_TMCA0000_TC_LIN_F</td><td>Boolean</td><td>Enter TRUE or FALSE.</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
RTD Wiring Configuration	MI_TMCA0000_RTD_WIR_CNFG_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • 2 Wire RTD • 3 Wire RTD • 4 Wire RTD • 2 Wire Ohms • 3 Wire Ohms • 4 Wire Ohms The list in this field is populated by the RTD Wiring Configuration value in the MI_CALIBRATION_REFERENCES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Linear TC LRV	MI_TMCA0000_LIN_TC_LRV_N	Numeric	None
Linear TC URV	MI_TMCA0000_LIN_TC_URV_N	Numeric	None
Custom Output Values	MI_TMCA0000_CUST_OUT_VAL_F	Boolean	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
Custom Input Values	MI_TMCA0000_CUST_IN_VAL_F	Boolean	Enter *TRUE* or *FALSE*.
Temperature Element Type	MI_TMCA0000_TMP_EL_TP_C	Character (50)	The list in this field is populated by the following values in the MI_CALIBRATION_REFERENCES System Code Table: • FLUKE TC TYPE • FLUKE RTD TYPE • GE DRUCK TC TYPE • GE DRUCK RTD TYPE If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Error Assessment	MI_TMCA0000_ERR_ASSES_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Percent of Range • Engineering Units The list in this field is populated by the MI_CALIBRATION_ERROR_ASSESSMENT System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Primary Output Units</td><td>MI_TMCA0000_PRI_OUT_UOM_C</td><td>Character (10)</td><td>A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:<table><tr><th>Calibration Type</th><th>System Code Table</th></tr><tr><td>Fluke 74x</td><td>UOME</td></tr><tr><td>Druck DPI620 (Genii)</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>Druck DPI61x</td><td>CALIBRATION_DRUCK_UOM_LIST</td></tr><tr><td>CMX</td><td>CALIBRATION_CMX_UOM_LIST</td></tr></table></td></tr>
</table>

MI_TASKCALB Worksheet

The MI_TASKCALB worksheet stores the details of the Calibration Task records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Task ID	MI_TASK_ID	Character (255)	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Asset ID	MI_TASK_RELAT_ENTIT_ID_CHR	Character (255)	A value is required. Enter the Equipment Technical Number that corresponds to the Equipment that is linked to the Calibration Template. If the value that you enter does not match the Equipment Technical ID of any Equipment in the GE Digital APM database, an error message appears, stating that the Asset is not found, and the batch is not imported.
Task Assigned To	MI_TASK_ASSGN_TO_C	Character (50)	None
Task Description	MI_TASK_DESC_TX	Character	None
Task State	MI_TASK_TASK_STATE_CHR	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • PROPOSED • SCHEDULED WITH CHANGE • SCHEDULED WITHOUT CHANGE The list in this field is populated by the CTST System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Reoccurring	MI_TASK_REOCC_FLG	Boolean	Enter TRUE or FALSE.
Route Number	MI_TASK_ROUTE_NO_C	Character (25)	None

Field Caption	Field ID	Data Type (Length)	Comments
Unconstrain Min/Max Dates	MI_TASK_UNCONSTR_MN_MX_DT_FLG	Boolean	Enter TRUE or FALSE.
Last Date	MI_TASK_LAST_DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Rejectable	MI_TASK_REJEC_FLG	Boolean	Enter TRUE or FALSE.
Modifiable	MI_TASK_MODIF_FLG	Boolean	Enter TRUE or FALSE.
Task Type	MI_TASK_TASK_TYPE_CHR	Character (50)	None
Min Interval	MI_TASK_MIN_INTER_NBR	Numeric	None
Desired Interval	MI_TASK_DESIR_INTER_NBR	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Desired Interval UOM	MI_TASK_DESIR_INTER_UOM_C	Character (50)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • Days • Months • Weeks • Years The list in this field is populated by the Interval value in the MI_STRATEGY_REFERENCE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Max Interval	MI_TASK_MAX_INTER_NBR	Numeric	None
Calibration Template ID	MI_TASKCALB_CALIB_TEMPL_ID_N	Numeric	None

MI_EVCAANLG Worksheet

The MI_EVCAANLG worksheet stores details of the Calibration, Analog records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Event ID	MI_EVENT_ID	Character (255)	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Calibration Strategy	MI_EVCALIBR_STRATEGY_C	Character (20)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • 2U • 2D • 2U/D • 3U • 3D • 3U/D • 5U • 5D • 5U/D • 5U/1D • 11U • 11D • 11U/D The list in this field is populated by the MI_CALIBRATION_STRATEGIES System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Calibration Type	MI_EVCALIBR_CALIB_TYP_C	Character (50)	A value is required. In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • ANALOG – MANUAL • SWITCH – MANUAL • FLUKE 74X • ANALYZER – MULTI COMPONENT • ANALYZER – SINGLE COMPONENT • FUNCTIONAL – MANUAL • Druck DPI61x • Druck DPI620 (Genii) The list in this field is populated by the MI_CALIBRATION_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
Primary Output LRV	MI_EVCALIBR_PRI_OUT_LRV_N	Numeric	A value is required.
Primary Input LRV	MI_EVCALIBR_PRI_IN_LRV_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Calibration Error Limit	MI_EVCALIBR_ERR_LIM_N	Numeric	A value is required.
Primary Output URV	MI_EVCALIBR_PRI_OUT_URV_N	Numeric	A value is required.
Primary Input URV	MI_EVCALIBR_PRI_IN_URV_N	Numeric	A value is required.
Asset Key	MI_EVENT_ASSET_KEY_N	Numeric	A value is required. Enter the Equipment Technical Number that corresponds to the Equipment that is linked to the Calibration Template. If the value that you enter does not match the Equipment Technical ID of any Equipment in the GE Digital APM database, an error message appears, stating that the Asset is not found, and the batch is not imported.
Asset ID	MI_EVENT_ASST_ID_CHR	Character (255)	Enter the Equipment Technical Number that corresponds to the Equipment that is linked to the Calibration Template. If the value that you enter does not match the Equipment Technical ID of any Equipment in the GE Digital APM database, an error message appears, stating that the Asset is not found, and the batch is not imported.
Location ID	MI_EVENT_LOC_ID_CHR	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Manufacturer	MI_EVCALIBR_ASST_MFG_C	Character (255)	None
Equipment Model Number	MI_EVCALIBR_ASST_MOD_NO_C	Character (255)	None
Equipment Serial Number	MI_EVCALIBR_ASST_SN_C	Character (255)	None
Maintenance Type	MI_EVCALIBR_MAINT_TYPE_C	Character (25)	In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs: • SCHEDULED • REPAIR • UNSCHEDULED • NEW INSTALLATION The list in this field is populated by the MI_MAINTENANCE_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.
WO Reference (Event)	MI_EVCALIBR_WO_NO_C	Character (30)	None

Field Caption	Field ID	Data Type (Length)	Comments
Scheduled Calibration Date	MI_EVCALIBR_SCHED_CAL_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Calibration Technician	MI_EVCALIBR_TECH_NM_C	Character (35)	None
Calibration Approval By	MI_EVCALIBR_CAL_APPR_NM_C	Character (50)	None
Primary Output Units	MI_EVCALIBR_PRI_OUT_UOM_C	Character (10)	A value is required. Depending on the value in the Calibration Type field, this field contains one of the following System Code Tables:

Calibration Type	System Code Table
Fluke 74x	UOME
Druck DPI620 (Genii)	CALIBRATION_DRUCK_UOM_LIST
Druck DPI61x	CALIBRATION_DRUCK_UOM_LIST
CMX	CALIBRATION_CMX_UOM_LIST

Field Caption	Field ID	Data Type (Length)	Comments
Secondary Output LRV	MI_EVCALIBR_SEC_OUT_LRV_N	Numeric	None
Secondary Output Units	MI_EVCALIBR_SEC_OUT_UOM_C	Character (10)	None
Secondary Output URV	MI_EVCALIBR_SEC_OUT_URV_N	Numeric	None
Test Equipment ID No 1	MI_EVCALIBR_TST_EQU_ID_01_C	Character (255)	None
Test Equipment ID No 2	MI_EVCALIBR_TST_EQU_ID_02_C	Character (255)	None
Test Equipment ID No 3	MI_EVCALIBR_TST_EQU_ID_03_C	Character (255)	None
Test Equipment Manufacturer 1	MI_EVCALIBR_TST_EQU_MFR_01_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Test Equipment Manufacturer 2	MI_EVCALIBR_TST_EQU_MFR_02_C	Character (50)	None
Test Equipment Manufacturer 3	MI_EVCALIBR_TST_EQU_MFR_03_C	Character (50)	None
Test Equipment Model Number 1	MI_EVCALIBR_TST_EQU_MDL_01_C	Character (50)	None
Test Equipment Model Number 2	MI_EVCALIBR_TST_EQU_MDL_02_C	Character (50)	None
Test Equipment Model Number 3	MI_EVCALIBR_TST_EQU_MDL_03_C	Character (50)	None
Test Equipment Serial Number 1	MI_EVCALIBR_TST_EQU_SN_01_C	Character (50)	None
Test Equipment Serial Number 2	MI_EVCALIBR_TST_EQU_SN_02_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Test Equipment Serial Number 3	MI_EVCALIBR_TST_EQU_SN_03_C	Character (50)	None
Test Equipment Cal. Expire 1	MI_EVCALIBR_TST_EQ_CAL_EX_1_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Test Equipment Cal. Expire 2	MI_EVCALIBR_TST_EQ_CAL_EX_2_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Test Equipment Cal. Expire 3	MI_EVCALIBR_TST_EQ_CAL_EX_3_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Test Equipment Last Cal. 1	MI_EVCALIBR_TST_EQ_LS_CAL_1_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Test Equipment Last Cal. 2	MI_EVCALIBR_TST_EQ_LS_CAL_2_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Test Equipment Last Cal. 3	MI_EVCALIBR_TST_EQ_LS_CAL_3_D	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Location Short Description	MI_EVENT_LOC_SHRT_DESC_CHR	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Asset Type	MI_EVENT_ASST_TYP_CHR	Character (50)	None
Asset Short Description	MI_EVENT_ASST_DESC_CHR	Character (255)	None
Asset Category	MI_EVENT_ASST_CTGRY_CHR	Character (50)	None
Primary Input Range Units	MI_EVCALIBR_PRI_IN_RV_UOM_C	Character (10)	A value is required.
Secondary Input LRV	MI_EVCALIBR_SEC_IN_LRV_N	Numeric	None
Calibration Closed	MI_EVCALIBR_CAL_CLOSE_L	Boolean	Enter *TRUE* or *FALSE*.
Secondary Input Range Units	MI_EVCALIBR_SEC_IN_RV_UOM_C	Character (10)	None
Secondary Input URV	MI_EVCALIBR_SEC_IN_URV_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
Input Characteristic Curve	MI_EVCALIBR_IN_CC_CURV_C	Character (25)	None
Event End Date	MI_EVENT_END_DT	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Event Start Date	MI_EVENT_STRT_DT	Date	A value is required. Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Meridium Family	MI_EVENT_FMLY_NM_CHR	Character (50)	A value is required. For Analog calibration, enter: MI_EVCAANLG
Event Long Description	MI_EVENT_LNG_DSC_TX	Character	None
Actual Work Time	MI_EVENT_ACTUAL_WRK_TM_N	Numeric	None
Calibration Template Key	MI_EVCALIBR_CAL_TMP_KEY_N	Numeric	A value is required. This cell may only contain a value that exists in the list in the Template ID field for Calibration Template, Analog records.
Off Line Duration	MI_EVCALIBR_OFF_LINE_DURA_N	Numeric	None
Calibration Task ID	MI_EVCALIBR_CAL_TSK_ID_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Test Equipment Status 1	MI_EVCALIBR_TST_EQU_STAT_01_C	Character (50)	None
Test Equipment Status 2	MI_EVCALIBR_TST_EQU_STAT_02_C	Character (50)	None
Test Equipment Status 3	MI_EVCALIBR_TST_EQU_STAT_03_C	Character (50)	None
Output Characteristic Curve	MI_EVCALIBR_OUT_CC_CURV_C	Character (25)	None
Event Family ID	Family_ID	Character	A value is required. For Analog calibration, enter: MI_EVCAANLG

MI_CRAN0000 Worksheet

The MI_CRAN0000 worksheet stores details of the Calibration Results, Analog records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.

Field Caption	Field ID	Data Type (Length)	Comments
Parent Key (Analog)	MI_CRAN0000_PARE_KEY_N	Numeric	A value is required. This cell may only contain a value that exists in the list in the Event ID field for Calibration, Analog records.
Parent Key (Discrete)	MI_CRDS0000_PARE_KEY_N	Numeric	A value is required. This cell may only contain a value that exists in the list in the Event ID field for Calibration, Discrete records.
As Found Error	MI_CALRESLT_AFE_N	Numeric	A value is required.
Input Measure AF	MI_CALRESLT_IN_MEAS_AF_N	Numeric	A value is required.
Primary Output AF	MI_CALRESLT_PRI_OUT_AF_N	Numeric	A value is required.
Calibration Sequence Number	MI_CALRESLT_TST_SEQ_N	Number	A value is required.
Event ID	MI_CALRESLT_ID	Character (255)	A value is required. Enter the ID of the Calibration Results, Analog record.
Input Measure AL	MI_CALRESLT_IN_MEAS_AL_N	Numeric	None
Percent of Scale TP	MI_CALRESLT_POS_TP_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Primary Output AL	MI_CALRESLT_PRI_OUT_AL_N	Numeric	None
Input Up/Dn	MI_CALRESLT_UP_DN_TP_C	Character (2)	A value is required. The following values are allowed: • UP • DN
Switch Number (Discrete)	MI_CRDS0000_SW_N	Numeric	A value is required.
As Found Reset Point (Discrete)	MI_CRDS0000_AF_RSET_N	Numeric	A value is required.
As Found Trip Point	MI_CRDS0000_AF_TP_N	Numeric	A value is required.
As Found Dead Band	MI_CRDS0000_AF_DB_N	Numeric	A value is required.
As Left Reset Point	MI_CRDS0000_AL_RSET_N	Numeric	A value is required.
As Left Trip Point	MI_CRDS0000_AL_TP_N	Numeric	A value is required.
As Left Dead Band	MI_CRDS0000_AL_DB_N	Numeric	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Calibration Results Family ID	Family_ID		A value is required.

MI_RECCLBN Worksheet

The MI_RECCLBN worksheet stores details of the Calibration Recommendation records.

Field Caption	Field ID	Data Type (Length)	Comments
BATCH_ID	BATCH_ID	Numeric	A value is required and must match one of the values that you enter in the Batch worksheet. Additionally, all the records that are linked to one another must contain the same batch number.
Target Completion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	A value is required. Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Recommendation ID	MI_REC_ID	Character (255)	A value is required.
Event ID	Event ID	Character	A value is required.
Reevaluate?	MI_REC_REEVAL_FLG	Boolean	Enter TRUE or FALSE.
Calibration Type	MI_RECCLBN_CALEVNT_CAT_CHR	Character (100)	A value is required.
Calibration Recommendation Basis	MI_RECCLBN_CALEVNT_ID_CHR	Character (100)	None

Field Caption	Field ID	Data Type (Length)	Comments
Reevaluation Notification List	MI_REC_REEVAL_NOTIF_LIST_CHR	Character (2000)	None
Days Before Due Date to be Notified	MI_REC_DAYS_BEF_DUE_DT_NOT_NBR	Numeric	None
Generate Work Request	MI_REC_WO_INTERFACE_FLAG_F	Boolean	Enter TRUE or FALSE.
Meridium Task ID	MI_REC_MERIDIUM_TASK_ID_C	Character (255)	None
Equipment ID	MI_REC_ASSET_ID_CHR	Character (2000)	A value is required.
Final State Lock	MI_REC_FINAL_STATE_LOCK_F	Boolean	Enter TRUE or FALSE.
Final Approver Name	MI_REC_FINAL_APPROVE_NAME_C	Character (255)	None
Required Equipment Status	MI_REC_REQUI_EQUIP_STATU_CHR	Character (50)	None
Reevaluation Alert Body Text	MI_REC_REEVAL_EMAIL_TX	Character	None

Field Caption	Field ID	Data Type (Length)	Comments
Implementation Alert Text	MI_REC_ NOTIF_ EMAIL_TEXT_ CHR	Character	None
Alert Assignee When Due?	MI_REC_ NOTIFY_RP_ FLG	Boolean	Enter TRUE or FALSE.
Reevaluation Date	MI_REC_ REEVAL_DT	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Business Impact	MI_REC_ IMPAC_CHR	Character (100)	None

<table>
<tr><th>Field Caption</th><th>Field ID</th><th>Data Type (Length)</th><th>Comments</th></tr>
<tr><td>Frequency of Alert After Due Date</td><td>MI_REC_ NOTIF_ AFTER_DD_ CHR</td><td>Character (50)</td><td>In the baseline GE Digital APM system, this cell may only contain one of the following System Code IDs:

<table><tr><th>Value</th><th>Description</th></tr><tr><td>N</td><td>Never</td></tr><tr><td>D</td><td>Daily</td></tr><tr><td>W</td><td>Weekly</td></tr><tr><td>M</td><td>Month</td></tr><tr><td>Y</td><td>Yearly</td></tr></table>
The list in this field is populated by the MI_FREQ_OF_ALERTS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.</td></tr>
<tr><td>Completion Comments</td><td>MI_REC_ CLOSE_ COMME_TX</td><td>Character</td><td>None</td></tr>
<tr><td>Implemented Date</td><td>MI_REC_ COMPL_ DATE_DT</td><td>Date</td><td>Enter the value in the following format: YYYY-MM-DD HH:mm:ss</td></tr>
<tr><td>Recommendation Headline</td><td>MI_REC_ SHORT_ DESCR_CHR</td><td>Character (255)</td><td>None</td></tr>
</table>

Field Caption	Field ID	Data Type (Length)	Comments
Recommendation Description	MI_REC_ LONG_ DESCR_TX	Character	None
Recommendation Priority	MI_REC_ PRIORITY_C	Character (50)	None
Author Lock	MI_REC_ AUTHOR_ LOCK_F	Boolean	Enter *TRUE* or *FALSE*.
Assigned To Name	MI_REC_ ASSIG_NM_ CHR	Character (255)	None
Mandatory Date	MI_REC_ MANDA_ DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss
Create SAP Notification?	MI_REC_ CREATE_SAP_ NOTIF_FLG	Boolean	Enter *TRUE* or *FALSE*.
Work Request Reference	MI_REC_WK_ REQ_REF_ CHR	Character (50)	None
Work Request Equipment	MI_REC_WR_ EQUIP_C	Character (255)	None
Work Request Functional Location	MI_REC_WR_ LOC_C	Character (255)	None
Technical Number	MI_REC_ TECHNICAL_ NUM_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Status CREATED	MI_REC_ STATU_CHR	Character (255)	None
Recommendation Type	MI_REC_ TYPE_CHR	Character (255)	None
Reviewer Name	MI_REC_ REVIE_NM_ CHR	Character (255)	None
Author Name	MI_REC_ AUTHO_NM_ CHR	Character (255)	None
Creation Date	MI_REC_ CREAT_DATE_ DT	Date	Enter a value in the following format: YYYY-MM-DD HH:mm:ss

About the Calibration Management Data Loader Load Verification

Following a successful data load, the user is able to navigate to any of the imported templates, to view the details and logic tree associated with the template, and to import template content into an analysis.

To test if the data is imported into GE Digital APM:

1. In the data loader worksheet, enter the following values:

Worksheet	Field Caption	Value
Batch	BATCH_ID	1
MI_ TESTEQUIP	BATCH_ID	1
	Equipment ID	ABC123
	Serial Number	123
	Certification Inter-val	1
	Certification Units	Years
	Model Number	ABC
	Manufacturer	ABC
	Last Certification Date	2015-11-15 17:30:00
	Site Reference Name	ABC
	Check Interval Units	Years
MI_TST_ EQUIP_HIST	BATCH_ID	1
	Parent ID	ABC123
	Certification Date	2015-11-15 17:30:00
	Certification Num-ber	1234
	Supplier	XYZ
	Entered By	PQR

Worksheet	Field Caption	Value
PROF_ TEMPLATES	BATCH_ID	1

Worksheet	Field Caption	Value
	Template ID	Temp1

Worksheet	Field Caption	Value
	Calibration Strategy	2U
	Input Type	Pressure
	Output Type	Resistance
	Primary Output URV (Analog)	50
	Primary Output LRV (Analog)	10
	SW 1 Setpoint (Discrete)	25
	Activate Switch 1 (Discrete)	1
	Max Error Limit	3
	SW 1 Contact State	1
	Calibration Type	ANALOG - MANUAL
	Primary Input Range Units	BAR
	Primary Output Units	OHMS
	Primary Input URV	1
	Primary Input LRV	5
	Calibration Family ID	MI_TMCAAN00
	Template State	DEVELOPMENT
	Loop Power	Disabled
	Manual Entered Input Values	FALSE

Worksheet	Field Caption	Value
	Manual Entered Output Values	FALSE
	Performs Square Root	N
	Enable Automated Calibration	FALSE
	TC Linear	FALSE
	Custom Input Values	FALSE
	Custom Output Values	FALSE
	Temperature Element Type	None
	Is Master Template	FALSE
	Error Assesment	Percent of Range
MI_CAL_PROF	BATCH ID	1
	Profile ID	Profile 1
	Profile Template	Profile Template 1
	Profile Template Family ID	MI_TMCAAN00

Worksheet	Field Caption	Value
MI_ TMCAAN00	BATCH ID	1

Worksheet	Field Caption	Value
	Template ID	Temp1

Worksheet	Field Caption	Value
	Calibration Strategy	2U
	Input Type	Pressure
	Output Type	Resistance
	Primary Output URV	50
	Primary Output LRV	10
	SW 1 Setpoint (Discrete)	15
	Activate Switch 1 (Discrete)	1
	Max Error Limit	3
	SW 1 Contact State	1
	Calibration Type	ANALOG - MANUAL
	Primary Input Range Units	BAR
	Primary Output Units	OHMS
	Asset Key	Enter the Equipment Technical Number of an Equipment record that exists in the GE Digital APM Database.
	Primary Input URV	1
	Primary Input LRV	5
	Calibration Fam-ily ID	MI_TMCAAN00
	Template State	DEVELOPMENT
	Asset Family Key	MI_EQUIP000

Worksheet	Field Caption	Value
	Loop Power	Disabled
	Manual Entered Input Values	FALSE
	Manual Entered Output Values	FALSE
	Performs Square Root	N
	Enable Automated Calibration	FALSE
	TC Linear	FALSE
	Custom Input Values	FALSE
	Custom Output Values	FALSE
	Temperature Element Type	None
	Is Master Template	FALSE
	Error Assesment	Percent of Range
	Profile ID	Profile 1

Worksheet	Field Caption	Value
MI_TASKCALB	BATCH ID	1
	Task ID	3456
	Asset ID	BSE-8374
	Task State	SCHEDULED WITHOUT CHANGE
	Reoccurring	TRUE
	Unconstrain Min/Max Dates	TRUE
	Rejectable	FALSE
	Modifiable	FALSE
	Task Type	CALIBRATION
	Min Interval	0
	Desired Interval	0
	Desired Interval UOM	DAYS
	Max Interval	0
	Calibration Tem-plate ID	Temp1

Worksheet	Field Caption	Value
MI_ EVCAANLG	BATCH ID	1

Worksheet	Field Caption	Value
	Event ID	567

Worksheet	Field Caption	Value
	Calibration Strategy	2U
	Calibration Type	ANALOG - MANUAL
	Primary Output LRV	10
	Primary Input LRV	1
	Calibration Error Limit	3
	Primary Output URV	50
	Primary Input URV	5
	Asset Key	Enter the value that you entered in the Asset Key field in the MI_TMCAAN00 worksheet.
	Maintenance Type	SCHEDULED
	Primary Output Units	OHMS
	Primary Input Range Units	BAR
	Calibration Closed	FALSE
	Test Equipment ID No 1	ABC123
	Primary Input Range Units	BAR
	Calibration Closed	FALSE
	Input Char-acteristic Curve	None
	Event Start Date	2015-11-20 18:30:30

Worksheet	Field Caption	Value
	Meridium Family	MI_EVCAANLG
	Calibration Tem-plate Key	Temp1
	Event Family ID	MI_EVCAANLG

Worksheet	Field Caption	Value
MI_CRAN0000	BATCH_ID	1

Worksheet	Field Caption	Value
	Parent Key(Ana-log)	567
	Parent Key(Dis-crete)	567
	As Found Error	0
	Input Measure AF	1 5
	Primary Output AF	10
	Calibration Sequence Num-ber	1
	Event ID	567
	Percent of Scale TP	100
	Input Up/Dn	UP
	Switch Number (Discrete)	1
	As Found Reset Point(Discrete)	75
	As Found Trip Point	80
	As Found Dead Band	22
	As Left Reset Point	80
	As Left Trip Point	5
	As Left Dead Band	2
	Calibration Res-ults Family ID	MI_CRAN0000

Worksheet	Field Caption	Value
MI_RECCLBN	BATCH_ID	1
	Target Com-pletion Date	2015-10-28 05:00:00
	Recommendation ID	REC-2684
	Reevaluate?	FALSE
	Calibration Type	MI_EVCAANLG
	Generate Work Request	FALSE
	Equipment ID	BSE-8374
	Final State Lock	FALSE
	Alert Assignee When Due?	FALSE
	Recommendation Headline	First recommendation
	Author Lock	FALSE
	Create SAP Noti-fication?	FALSE
	Status	CREATED
	Recommendation Type	CALIBRATION

2. Import the data loader worksheet into GE Digital APM.
3. Access the Calibration Management Overview page.
4. Verify that the following records are created:

Record ID	Type	Linked to:
ABC123	Test Equipment	None
	Test Equipment History	ABC123
Temp1	Calibration Template, Analog	None

Record ID	Type	Linked to:
3456	Calibration Task	Temp1
567	Calibration, Analog	ABC123 Temp1 3456
	Calibration Results, Analog	567

About the Hazards Data Loader

Using the Hazards Data Loader, you can implement HAZOP Analysis when you have data in a legacy system. To import data using the Hazards Data Loader, GE Digital APM provides an Excel workbook, **Hazards.xlsx**, which supports baseline Hazards Analysis in GE Digital APM. You must export your legacy system so that the data can be used to populate the workbook. The data from the workbook will then be imported into GE Digital APM using the Hazards Data Loader.

Note: The Excel template is referred to throughout this documentation as the *data loader workbook*.

The data loader workbook can be used in the following scenario:

- Loading existing legacy HAZOP analysis data into GE Digital APM so that you can retain visibility into previous HAZOP analyses, view the risk mitigation graph and re-validation schedules.

After importing the data, the Hazards Data Loader creates the following records in GE Digital APM:

- Hazards Analysis
- Hazards Analysis System/Node
- Hazards Analysis Deviation
- Hazards Analysis Cause
- Hazards Analysis Consequence
- Hazards Analysis Safeguard
- Independent Layer of Protection
- Risk Assessment
- Risk Assessment Recommendation
- Human Resource

Note: This data loader workbook is not backward compatible to earlier versions of GE Digital APM.

About the Hazards Data Loader Requirements

Before importing data using the data loader workbook, you must have completed the deployment of the Hazards Analysis module. You must also have populated the Equipment and Functional Location to establish relationship with the families in Hazards Analysis, and have entered a valid Equipment entity key and Functional Location entity key into the data loader workbook. To do this, the Equipment and Functional Locations must exist in the GE Digital APM database.

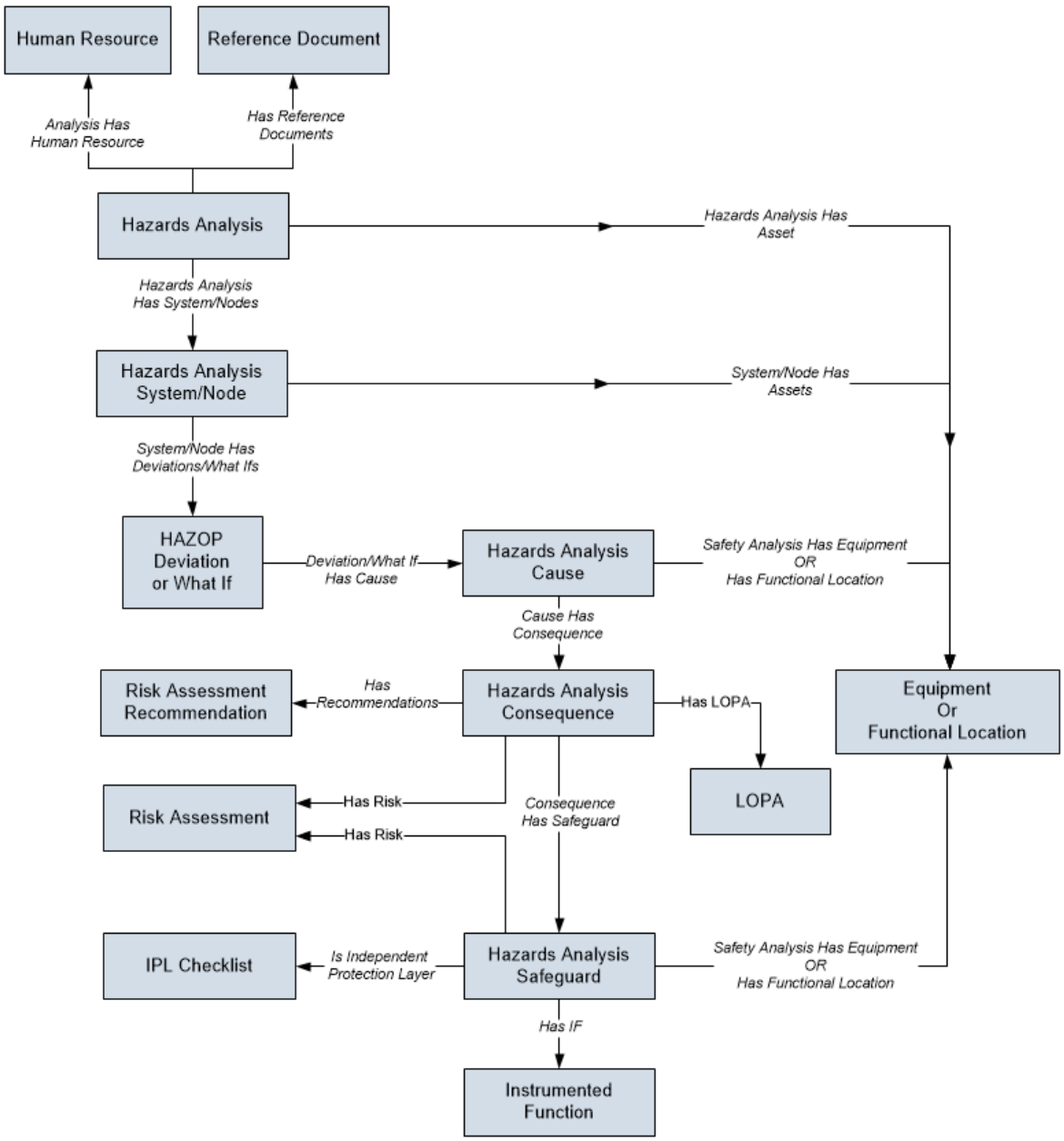
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role.

About the Hazards Data Loader Data Model

The following data model illustrates the records that the Data Loader supports.

Note: Equipment and Functional Location records must exist prior to importing data.



About the Hazards Data Loader General Loading Strategy

The imported data must load in a specific sequence in order to successfully populate fields, to create records, and to link them to the predecessor and/or successor records.

Best Practices

When importing data using the data loader workbook, you must use the following best practices:

- ID fields (Row 2 of each worksheet) must not include special characters (other than underscores) or spaces.
- Columns (including columns representing custom fields) in the worksheets should be formatted as Text.
- You should not try to create and update a component in the same data loader workbook.
- You must consider the rules described in the Workbook Layout and Use section of this document while using the Hazards Data Loader.

Load Sequence

When importing data using the data loader workbook, you must use the following workflow:

1. Download the data loader workbook provided by GE Digital
2. Identify the data requirements for exporting the data in to the data loader workbook.
3. Extract data from legacy applications to populate the data loader workbook.
4. Import data into GE Digital APM.
5. Monitor the status of the data load, and verify the results in the log.
6. Conduct tests in GE Digital APM to ensure that the imported data loaded accurately.

For each row in the data loader workbook, the Hazards Loader creates a new record in GE Digital APM. However, if records have already been created and you reimport the data, the existing records will be updated.

About the Hazards Data Loader Workbook Layout and Use

To import Hazards Analysis data, GE Digital APM provides the data loader workbook (**Hazards.xlsx**). This workbook supports baseline Hazards Analysis in GE Digital APM. You can modify the workbook to include custom fields used by your organization.

The following table lists the worksheets that are included in the data loader workbook.

Worksheet	Description
MI_HAZANANA	This worksheet is used to define the Hazards Analysis records.
MI_HAZANNOD	This worksheet is used to define Hazards Analysis System/Node records.
Node_Assets	This worksheet is used to identify Equipment and Functional Location records.
MI_HAZOPDEV	This worksheet is used to define HAZOP Deviation records.
MI_HAZANCAU	This worksheet is used to define Hazards Analysis Cause records.
MI_HAZANCON	This worksheet is used to define Hazards Analysis Consequence records.
MI_HAZANSAF	This worksheet is used to define Hazards Analysis Safeguard records.
MI_IPL_CHEC	This worksheet is used to define IPL Checklist records
MI_RISKASSE	This worksheet is used to define Risk Assessment records.
MI_RSKASREC	This worksheet is used to define Risk Assessment Recommendation records.
MI_Human_Resource	This worksheet is used to define Human Resource records.

Limitations

The Hazards Data Loader has the following limitations:

- You can import data related to HAZOP Analysis only.
- You must use the data loader workbook. If you modify the format of the values in columns in any of the worksheets, you will not be able to import data.
- The values that you enter in the data loader workbook are case-sensitive.
- If you reimport data, the records that were created by the Hazards Data Loader will be updated. Therefore, while reimporting data related to a record, if you remove the data for a field in the data loader workbook, the value for the corresponding field in GE Digital APM will be blank.

MI_HAZANANA Worksheet

The MI_HAZANANA worksheet stores the details of the Hazards Analysis records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must be unique. This value identifies the Hazards Analysis.
Site Reference Name	MI_SITE_NAME	Character (50)	This field is required and must match an existing Site name. **Note:** If you want to set the site reference to be a Global Site Reference, in the MI_SITE_NAME column on the spreadsheet, enter the constant **Global**.
Unit Description	MI_HAZANANA_UNIT_DESCR_C	Character (255)	None
Unit ID	MI_HAZANANA_UNIT_ID_C	Character (50)	None
Process Type	MI_HAZANANA_PROCE_TYPE_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Process Description	MI_HAZANANA_PROCE_DESCR_T	Text	None
Summary	MI_HAZANANA_SUMMA_T	Text	None
Last Modified By	MI_HAZANANA_LAST_MODIF_BY_C	Character (255)	None
Last Modified Date	MI_HAZANANA_LAST_MODIF_DATE_D	Date	None
State	MI_SM_STATE_ID_C	Character (50)	None
State Owner	MI_SM_STATE_OWNER_ID_C	Character (255)	None
Revision Number	MI_HAZANANA_REVIS_NUMBE_C	Character (50)	None
Revision Date	MI_HAZANANA_REVIS_DATE_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
MI_SM_STATE_ENTERED_D	MI_SM_STATE_ENTERED_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Analysis Purpose	MI_HAZANANA_ANALY_PURPO_T	Text	None
Analysis Scope	MI_HAZANANA_ANALY_SCOPE_T	Text	None
Analysis Objective	MI_HAZANANA_ANALY_OBJEC_T	Text	None
Analysis End Date	MI_AN_ANALY_END_DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Start Date	MI_AN_ANALY_START_DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Process Life Cycle Phase	MI_HAZANANA_PROCE_LIFE_CYCLE_C	Character (255)	By default, in GE Digital APM system, this field may contain one of the following System Code IDs: • Design and Development • Construction and Startup • Operate and Maintain • Decommissioning The list in this field is populated by the MI_HAZARDS_ANALYSIS_LIFE_CYCLE_PHASE System Code Table. If the system code table has been modified, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the MI_HAZARDS_ANALYSIS_LIFE_CYCLE_PHASE System Code Table.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Description	MI_AN_SHORT_DESCR_CHR	Character (255)	None
Is Deleted	MI_HAZANANA_IS_DELET_L	Boolean	Enter *TRUE* or *FALSE*.
Reevaluation Interval	MI_HAZANANA_ANALY_REEV_N	Numeric	None
Analysis Type	MI_AN_ANALY_TYPE_CHR	Character (59)	By default, in GE Digital APM system, this fields may contain one of the following values: • HAZOP • What If
Next Reevaluation Date	MI_HAZANANA_NEXT_REEVA_DATE_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Production Unit Key	MI_ANLY_PROD_UNIT_KEY_N	Numeric	None
State Key TEST	MI_SM_STATE_KEY_N	Numeric	None
Visual Attributes	MI_AN_VISUA_ATTRI_TX	Character	None

MI_HAZANNOD Worksheet

The MI_HAZANNOD worksheet stores the details of the Hazards Analysis System/Node records.

Field Caption	Field ID	Data Type (Length)	Comments

Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node ID	MI_HAZANNOD_NODE_ID_C	Character (255)	A value is required and must be unique.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Systems/Nodes in a Hazards Analysis, then the values in this column for the three Systems/Nodes must be 1, 2, and 3.
Modified By	MI_TST_EQUIP_HIST_DATE_C	Character (255)	None
Modified Date	MI_HAZANNOD_MODIF_BY_C	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Reference Drawing	MI_HAZANNOD_MODIF_DATE_D	Character (255)	None
System/Node Description	MI_HAZANNOD_REFER_DRAWI_C	Text	None
System/Node Equipment Type	MI_HAZANNOD_NODE_DESCR_T	Character (255)	None

System/Node Process Type	MI_HAZANNOD_NODE_EQUIP_TYPE_C	Character (255)	None
System/Node Comments	MI_HAZANNOD_COMME_T	Text	None

Node_Assets Worksheet

The Node_Assets worksheet identifies the Equipment and Functional Location records, and links them to each Hazards Analysis.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node ID	MI_HAZANNOD_NODE_ID_C	Character (255)	A value is required and must match the ID of a System/Node that exists in GE Digital APM or one of the values that you enter in the MI_HAZANNOD worksheet.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match the value in the System/Node Number field of the System/Node whose ID you have provided in the System/Node ID column.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Function Location ID	MI_FNCLOC00_INTERNAL_ID_C	Character (255)	None

MI_HAZOPDEV Worksheet

The MI_HAZOPDEV worksheet stores the details of the HAZOP Deviation records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the System/Node Number field, in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Deviations in a System/Node, then the values in this column for the three Deviations must be 1, 2, and 3.
Deviation/Guideword	MI_HAZOPDEV_DEVIA_C	Character (255)	None

MI_HAZANCAU Worksheet

The MI_HAZANCAU worksheet stores details of the Hazards Analysis Cause records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZOPDEV worksheet.
Cause Sequence Number	MI_HAZANCAU_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Causes for a Deviation, then the values in this column for the three Causes must be 1, 2, and 3.
Cause ID	MI_HAZANCAU_CAUSE_ID_C	Character (255)	A value is required.
Functional Location ID	MI_HAZANCAU_FUNCT_LOCAT_ID_C	Character (255)	None
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Cause Comment	MI_HAZANCAU_CAUSE_COMME_T	Text	None
Cause Description	MI_HAZANCAU_CAUSE_DESCR_T	Text	None
Cause Type	MI_HAZANCAU_CAUSE_TYPE_CHR	Character (100)	In the baseline GE Digital APM system, this cell is the CCPS Cause Type field and may contain is populated by the value in the Initiating Event ID field of the Initiating Event records. The Cause Frequency (per year) field is populated with the default value of frequency specified in the Initiating Event record based on your selection in the CCPS Cause Type field.

MI_HAZANCON Worksheet

The MI_HAZANCON worksheet stores details of the Hazards Analysis Consequence records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.

Field Caption	Field ID	Data Type (Length)	Comments
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZOPDEV worksheet.
Cause Sequence Number	MI_HAZANCAU_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCAU worksheet.
Consequence ID	MI_HAZANCON_CONSE_ID_C	Character (255)	A value is required.
Consequence Sequence Number	MI_HAZANCON_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Consequences for a Cause, then the values in this column for the three Consequences must be 1, 2, and 3.
Consequence Description	MI_HAZANCON_CONSE_DESCR_T	Text	None
Consequence Comment	MI_HAZANCON_CONSE_COMME_T	Text	None

Field Caption	Field ID	Data Type (Length)	Comments
Consequence Type	MI_HAZANCON_CONSE_TYPE_C	Character (100)	None

MI_HAZANSAF Worksheet

The MI_HAZANSAF worksheet stores details of the Hazards Analysis Safeguard records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZOPDEV worksheet.
Cause Sequence Number	MI_HAZANCAU_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCAU worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Consequence Sequence Number	MI_HAZANCON_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Consequences for a Cause, then the values in this column for the three Consequences must be 1, 2, and 3.
Safeguard ID	MI_HAZANSAF_SAFEG_ID_C	Character (255)	A value is required.
Safeguard Sequence Number	MI_HAZANSAF_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Safeguards for a Consequence, then the values in this column for the three Safeguards must be 1, 2, and 3.
Functional Location ID	MI_HAZANSAF_FUNCT_LOCAT_ID_C	Character (255)	Enter a value that matches the value in the Functional Location ID field of a Functional Location that exists in the database.
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	Enter a value that matches the value in the Equipment Technical Number field of an Equipment that exists in the database.
Safeguard Comment	MI_HAZANSAF_SAFEG_COMME_T	Character	None
Safeguard Type	MI_HAZANSAF_SAFEG_TYPE_C	Character (100)	None

Field Caption	Field ID	Data Type (Length)	Comments
Safeguard Description	MI_HAZANSAF_SAFEG_DESCR_T	Text	None
IF ID	MI_HAZANSAF_PIF_ID_C	Character (255)	You must enter a value that matches the value in the PIF ID field of an Instrumented Function that exists in the database.
Is the IPL independent of the initiating cause of the hazardous scenario?	MI_HAZANSAF_IS_IPL_INDEP_L	Boolean	Enter *TRUE* or *FALSE*.
Is the IPL specific in that it has the ability to detect the hazardous scenario?	MI_HAZANSAF_IS_IPL_SPCFC_L	Boolean	Enter *TRUE* or *FALSE*.
Is the IPL auditable with applicable industry standard?	MI_HAZANSAF_IS_IPL_ADTBL_L	Boolean	Enter *TRUE* or *FALSE*.
Is the IPL capable with respect to its availability?	MI_HAZANSAF_IS_IPL_CPBL_L	Boolean	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
IPL Type	MI_HAZANSAF_IPL_TYPE_C	Character (50)	In the baseline GE Digital APM system, this cell may contain one of the following System Code IDs: • Consequence Reducing IPL • Frequency Reducing IPL The list in this field is populated by the MI_HAZOP_IPL_TYPE System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, using Configuration Manager, access and verify with the appropriate System Code table.
IPL Credits	MI_HAZANSAF_IPL_CREDI_N	Numeric	In the baseline GE Digital APM system, this cell may contain a value between 1 and 10.

Field Caption	Field ID	Data Type (Length)	Comments
Type	MI_HAZANSAF_TYPE_C	Character (50)	This field is stored only if the values for all the IPL Criteria associated with the Safeguard is *TRUE*. In the baseline GE Digital APM system, this cell may contain one of the following System Code IDs: • Active IPL • Passive IPL • Human IPL The list in this field is populated by the MI_IPL_TYPES_SAFEGUARD System Code Table. If the System Code Table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, using Configuration Manager, access and verify with the MI_IPL_TYPES_SAFEGUARD System Code Table.

Field Caption	Field ID	Data Type (Length)	Comments
IPL Sub Type	MI_ HAZANSAF_ IPL_SUB_ TYPE_C	Character (250)	This field is stored only if the values for all the IPL Criteria associated with the Safeguard is *TRUE*. In the baseline GE Digital APM system, this cell may contain System Codes from one of the following System Code Tables: • MI_ACTIVE_IPL System Code table if the value in the IPL Type field is *Active IPL*. • MI_PASSIVE_IPL System Code table if the value in the IPL Type field is *Passive IPL*. • MI_HUMAN_IPL System Code table if the value in the IPL Type field is *Human IPL*. To verify which options are acceptable in your GE Digital APM system, using Configuration Manager, access and verify with the appropriate System Code Table.

Field Caption	Field ID	Data Type (Length)	Comments
PFD	MI_HAZANSAF_PFD_N	Numeric	This field is stored only if the values for all the IPL Criteria associated with the Safeguard is *TRUE*. The default value for the PFD field for each IPL Sub Type is provided in the following records: • Active IPL record if the value in the IPL Type field is *Active IPL*. • Passive IPL record if the value in the IPL Type field is *Passive IPL*. • Human IPL record if the value in the IPL Type field is *Human IPL*. To verify which value is acceptable in your GE Digital APM system, using Record Manager, access and verify with the appropriate record.

MI_IPL_CHEC Worksheet

The MI_IPL_CHEC worksheet stores details of the IPL Checklist records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.

Field Caption	Field ID	Data Type (Length)	Comments
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZOPDEV worksheet.
Cause Sequence Number	MI_HAZANCAU_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCAU worksheet.
Consequence Sequence Number	MI_HAZANCON_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Consequences for a Cause, then the values in this column for the three Consequences must be 1, 2, and 3.
Safeguard ID	MI_HAZANSAF_SAFEG_ID_C	Character (255)	A value is required.
Safeguard Sequence Number	MI_HAZANSAF_SEQUE_NUMBE_N	Numeric	A value is required and must follow a sequence. For example, if there are three Safeguards for a Consequence, then the values in this column for the three Safeguards must be 1, 2, and 3.

Field Caption	Field ID	Data Type (Length)	Comments
IPL Criteria	MI_IPL_CHEC_IPL_CRIT_C	Character (250)	In the baseline GE Digital APM system, this cell may contain one of the following values: • Is the IPL Independent of the initiating cause of the hazardous scenario? • Is the IPL Auditable with applicable industry standard? • Is the IPL Specific in that has the ability to detect the hazardous scenario? • Is the IPL Capable with respect to its availability? • Is the Risk Reduction Factor (RRF) >= 10? The list in this field is populated by the Asset Safety Preferences records. If the records have been customized, the valid values could be different. To verify which options are acceptable, access the administrative settings for LOPA to view the list of criteria configured in your GE Digital APM system.
IPL Criteria Value	MI_IPL_CHEC_IPL_CRIT_VALU_F	Boolean	Enter *TRUE* or *FALSE*.

MI_RISKASSE Worksheet

The MI_RISKASSE worksheet stores details of the Risk Assessment records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZOPDEV worksheet.
Cause Sequence Number	MI_HAZANCAU_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCAU worksheet.
Consequence Sequence Number	MI_HAZANCON_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCON worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Safeguard Sequence Number	MI_HAZANSAF_SEQUE_NUMBE_N	Character (10)	A value is required and must match one of the values that you enter in the MI_HAZANSAF worksheet.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	None
(OPERATIONS) consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None

MI_RSKASREC Worksheet

The MI_RSKASREC worksheet stores details of the Risk Assessment Recommendation records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
System/Node Number	MI_HAZANNOD_NODE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANNOD worksheet.
Deviation Sequence Number	MI_HAZOPDEV_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZOPDEV worksheet.
Cause Sequence Number	MI_HAZANCAU_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCAU worksheet.

Field Caption	Field ID	Data Type (Length)	Comments
Consequence Sequence Number	MI_HAZANCON_SEQUE_NUMBE_N	Numeric	A value is required and must match one of the values that you enter in the MI_HAZANCON worksheet.
Recommendation ID	MI_REC_ID	Character (255)	A value is required.
Target Completion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	A value is required. Enter the value in the following format: YYYY-MM-DD hh:mm:ss
Status	MI_REC_STATU_CHR	Character (50)	In the baseline GE Digital APM system, this cell may contain one of the following System Code IDs: • APPROVED • CREATED • PENDING REVIEW • REVIEWED • REJECTED • CANCELLED • SUPERCEDED • IN PROGRESS • IMPLEMENTED The list in this field is populated by the MI_STATUS System Code Table. If the system code table has been customized, the valid values could be different. To verify which options are acceptable in your GE Digital APM system, via Configuration Manager, refer to the appropriate table.

Field Caption	Field ID	Data Type (Length)	Comments
Equipment Technical Number	MI_EQUIP000_EQUIP_TECH_NBR_C	Character (255)	None
Days Before Due Date to be Notified	MI_REC_DAYS_BEF_DUE_DT_NOT_NBR	Numeric	None
Reevaluate?	MI_REC_REEVAL_FLG	Boolean	Enter *TRUE* or *FALSE*.
Reevaluation Notification List	MI_REC_REEVAL_NOTIF_LIST_CHR	Character (2000)	None
Work Request Reference	MI_REC_WK_REQ_REF_CHR	Character (50)	None
Work Order Number	MI_REC_WORK_ORDER_NUMB_CHR	Character (50)	None
Generate Work Request	MI_REC_WO_INTERFACE_FLAG_F	Boolean	Enter *TRUE* or *FALSE*.
Meridium Task ID	MI_REC_WO_INTERFACE_FLAG_F	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Reviewer ID	MI_REC_REVIE_CHR	Character (255)	Enter *TRUE* or *FALSE*.

Field Caption	Field ID	Data Type (Length)	Comments
Alert Assignee When Due?	MI_REC_ NOTIFY_RP_ FLG	Boolean	None
Reevaluation Date	MI_REC_ REEVAL_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Implementation Alert Text	MI_REC_ NOTIF_EMAIL_ TEXT_CHR	Text	None
Required Equip-ment Status	MI_REC_ REQUI_ EQUIP_ STATU_CHR	Character (50)	None
Business Impact	MI_REC_ IMPAC_CHR	Character (100)	None
Published Flag	MI_REC_PUB_ FLAG_F	Boolean	Enter *TRUE* or *FALSE*.
Final Approver ID	MI_REC_ FINAL_ APPRO_ID_C	Character (255)	None
Associated Refer-ence	MI_REC_ EVNTREF_CHR	Character (255)	None
Generate Meridium Task	MI_REC_ GENERATE_ MERID_TASK_ F	Boolean	Enter *TRUE* or *FALSE*.
Final Approver Name	MI_REC_ FINAL_ APPROVE_ NAME_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Reviewer Name	MI_REC_ REVIE_NM_ CHR	Character	None
Reevaluation Alert Body Text	MI_REC_ REEVAL_ EMAIL_TX	Text	None
Final State Lock	MI_REC_ FINAL_STATE_ LOCK_F	Boolean	Enter *TRUE* or *FALSE*.
Completed Date	MI_REC_ COMPL_ DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Recommendation Priority	MI_REC_ PRIORITY_C	Character (50)	None
Recommendation Description	MI_REC_ LONG_ DESCR_TX	Text	None
Recommendation Headline	MI_REC_ SHORT_ DESCR_CHR	Character (255)	None
Frequency of Alert After Due Date	MI_REC_ NOTIF_AFTER_ DD_CHR	Character (50)	None
Recommendation Basis	MI_REC_BASIS	Character (255)	None
Author Lock	MI_REC_ AUTHOR_ LOCK_F	Boolean	Enter TRUE or FALSE.

Field Caption	Field ID	Data Type (Length)	Comments
Author Name	MI_REC_ AUTHO_NM_ CHR	Character (255)	None
Assigned To Name	MI_REC_ ASSIG_NM_ CHR	Character (255)	None
Author User ID	MI_REC_ AUTHO_CHR	Character (255)	None
State	MI_SM_ STATE_ID_C	Character	None
Mandatory Date	MI_SM_ STATE_ID_C	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
State Owner	MI_SM_ STATE_ OWNER_ID_C	Character	None
State Entered	MI_SM_ STATE_ ENTERED_D	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Analysis ID	MI_REC_ ANALY_ID_ CHR	Character (255)	None
Create Work Request?	MI_REC_ CREATE_SAP_ NOTIF_FLG	Boolean	Enter TRUE or FALSE.
Work Request Functional Location	MI_REC_WR_ LOC_C	Character (255)	None
Work Request Equipment	MI_REC_WR_ EQUIP_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Notification Type	MI_REC_ NOTIF_TYPE_C	Character (2)	None
Assigned To User ID	MI_REC_ ASSIG_TO_ CHR	Character (255)	None
Recommendation Type	MI_REC_TYPE_ CHR	Character (255)	None
Completion Comments	MI_REC_ CLOSE_ COMME_TX	Text	None
Functional Location Key	MI_ RSKASREC_ FUNCT_ LOCAT_KEY_N	Numeric	None
Functional Location ID	MI_REC_LOC_ ID_CHR	Character (2000)	None
Recommendation Closure Date	MI_REC_ CLOSE_DATE_ DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Last Change Date	MI_REC_LAST_ CHANG_ DATE_DT	Date	Enter a value in the following format: YYYY-MM-DD hh:mm:ss
Last Changed By	MI_REC_LAST_ CHANG_BY_ CHR	Character (255)	None
Technical Number	MI_REC_ TECHNICAL_ NUM_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Asset Description	MI_REC_ ASSET_ DESCR_C	Character (255)	None
Action Interval Units	MI_ RSKASREC_ INTER_UNITS_ C	Character (50)	None
Action Interval	MI_ RSKASREC_ INTER_UNITS_ C	Numeric	None
State Key	MI_SM_ STATE_KEY_N	Numeric	None

MI_Human_Resource Worksheet

The MI_Human_Resource worksheet stores details of the Human Resource records.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis ID	MI_AN_ANALY_ID_CHR	Character (255)	A value is required and must match one of the values that you enter in the MI_HAZANANA worksheet. Additionally, all the records that are linked to one another must contain the same Analysis ID.
First Name	MI_HR_FIRST_NAME_CHR	Character (255)	A value is required.

Field Caption	Field ID	Data Type (Length)	Comments
Last Name	MI_HR_LAST_NAME_CHR	Character (255)	A value is required.
Resource ID	MI_RES_ID_CHR	Character (255)	A value is required.
Badge Id	MI_HR_BADGE_ID	Character (20)	None
Company Id	MI_HR_COMPANY_CHR	Character (255)	None
Department	MI_HR_DEPT_CHR	Character (255)	None
Address1	MI_HR_ADDR1_CHR	Character (255)	None
Address2	MI_HR_ADDR2_CHR	Character (255)	None
Area of Respons-ibility	MI_HR_AREA_ RESPONSIBILITY_TX	Character (100)	None
Facility	MI_HR_AREA_ RESPONSIBILITY_TX	Character (50)	None
Business Unit	MI_HR_BUSINESS_UNIT_ TX	Character (50)	None
Domain	MI_HR_DOMAIN_TX	Character (50)	None
Culture	MI_HR_CULTURE_ID	Character (10)	None
City	MI_HR_CITY_CHR	Character (255)	None
State	MI_HR_STATE_CHR	Character (255)	None
Postal Code	MI_HR_POSTCODE_CHR	Character (100)	None
Country	MI_HR_COUNTRY_CHR	Character (50)	None
Phone1	MI_HR_PHONE1_CHR	Character (50)	None
Phone2	MI_HR_PHONE2_CHR	Character (50)	None
Fax	MI_HR_FAX_CHR	Character (50)	None
Email Address	MI_HR_EMAIL_TX	Character (500)	None
Comments	MI_HR_COMMENTS_TX	Text	None

Field Caption	Field ID	Data Type (Length)	Comments
Available?	MI_HR_AVAIL_CHR	Character (10)	None
Site Code	MI_SITE_CD_CHR	Character (20)	None

About the Hazards Data Loader Load Verification

Following a successful data load, the user is able to navigate to any of the imported templates, to view the details associated with the template, and to import template content into an analysis.

To test if the data is imported into GE Digital APM:

1. In the data loader worksheet, enter the following values:

Worksheet	Field Caption	Value
MI_ HAZANANA	Analysis ID	Hazop-DL-Testing-01
	Analysis Type	HAZOP
	Site Reference Name	ISO Site
MI_ HAZANNOD	Analysis ID	Hazop-DL-Testing-01
	System/Node ID	Node-01
	System/Node Number	1
	Analysis ID	Hazop-DL-Testing-01
	System/Node ID	Node-02
	System/Node Number	2
Node_ Assets	Analysis ID	Hazop-DL-Testing-01
	System/Node ID	Node-01
	System/Node Number	1
	Equipment Technical Number	A001

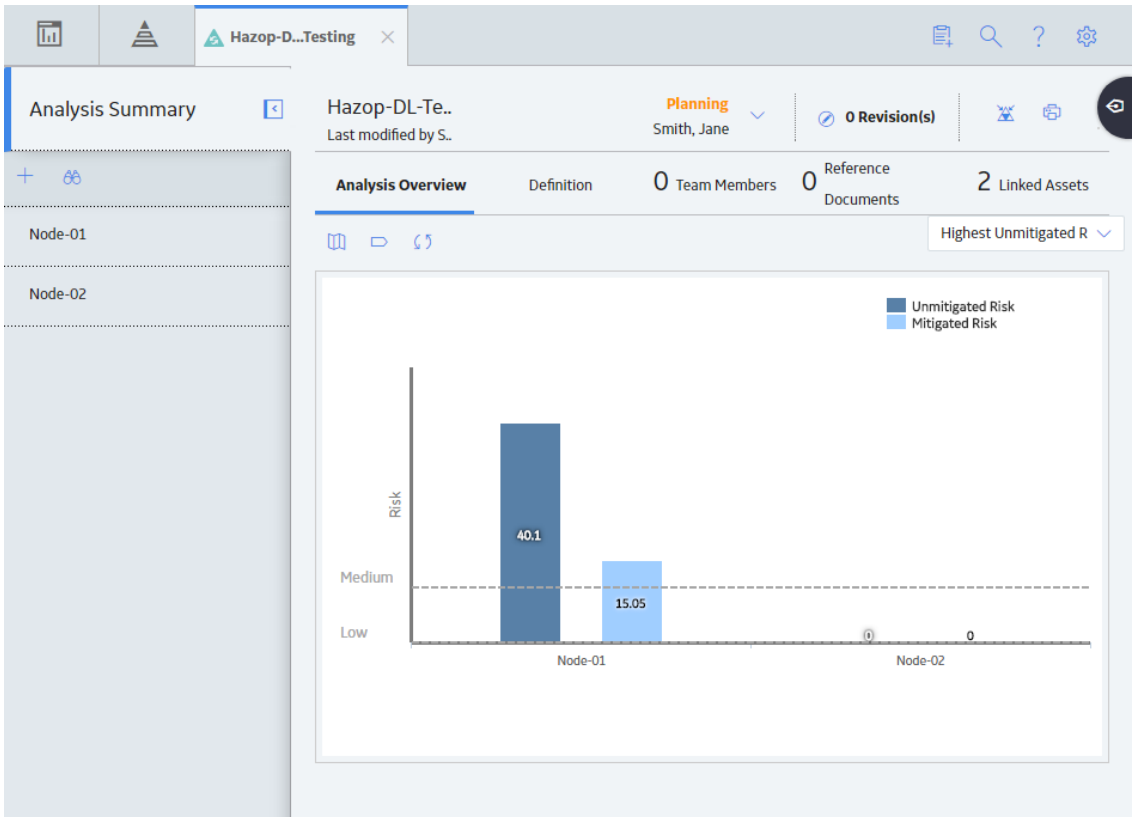
Worksheet	Field Caption	Value
MI_ HAZOPDEV	Analysis ID	Hazop-DL-Testing-01
	System/Node Number	1
	Deviation Sequence Number	1
	Deviation/Guideword	More Temperature
	Analysis ID	Hazop-DL-Testing-01
	System/Node Number	2
	Deviation Sequence Number	1
	Deviation/Guideword	Less Flow
MI_ HAZANSAF	Analysis ID	Hazop-DL-Testing-01
	System/Node ID	Node-01
	System/Node Number	1
	Deviation Sequence Number	1
	Cause Sequence Number	1
	Consequence Sequence Number	1
	Safeguard ID	Node-01 Safeguard
	Safeguard Sequence Number	1
MI_ HAZANCAU	Analysis ID	Hazop-DL-Testing-01
	System/Node Number	1
	Deviation Sequence Number	1
	Cause Sequence Number	1
	Cause ID	Cause-01

Worksheet	Field Caption	Value
MI_ HAZANCON	Analysis ID	Hazop-DL-Testing-01
	System/Node Number	1
	Deviation Sequence Number	1
	Cause Sequence Number	1
	Consequence ID	Consequence-01
	Consequence Sequence Number	1
MI_IPL_ CHEC	Safeguard Sequence Number	1
	IPL Criteria	Is the IPL independent of the initiating cause of the hazardous scenario?
	IPL Criteria Value	FALSE

Worksheet	Field Caption	Value
MI_ RISKASSE	Analysis ID	Hazop-DL-Testing-01
	System/Node ID	Node-01
	System/Node Number	1
	Deviation Sequence Number	1
	Cause Sequence Number	1
	Consequence Sequence Number	1
	Safeguard Sequence Number	1
	(ENVIRONMENT) Consequence	1
	(ENVIRONMENT) Probability	1
	(FINANCIAL) Consequence	550
	(FINANCIAL) Maintenance Cost	50
	(FINANCIAL) Probability	5
	(FINANCIAL) Production Loss	500
	(OPERATIONS) consequence	100
	(OPERATIONS) Probability	0.1
	(SAFETY) Consequence	100
	(SAFETY) Probability	0.3

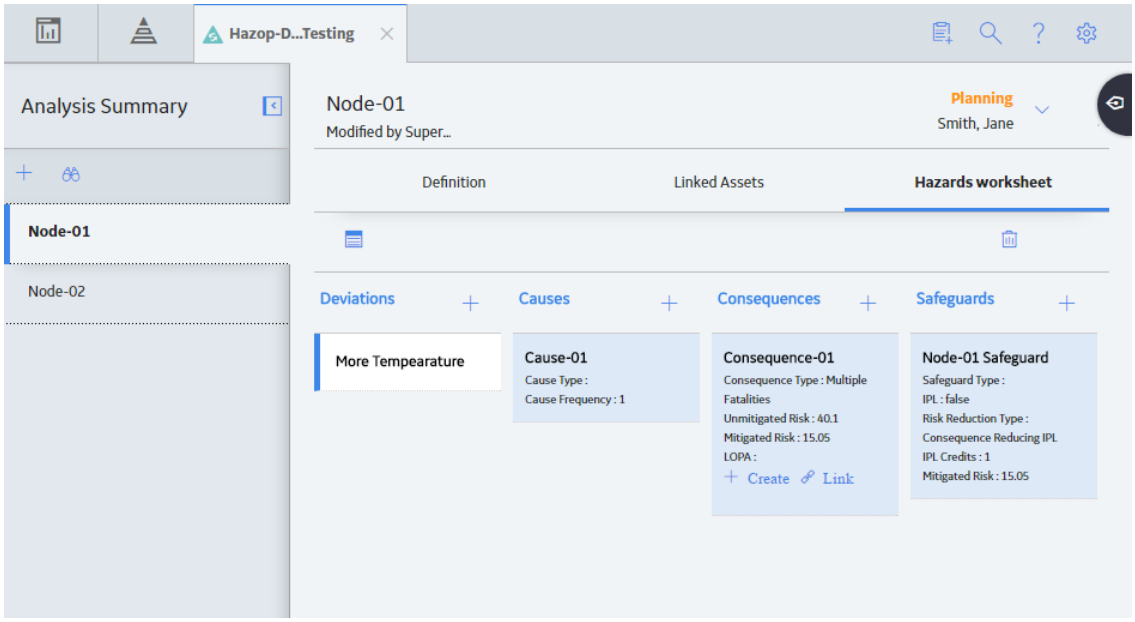
2. Import the data loader worksheet into GE Digital APM.
3. Access the **Hazards Analysis Overview** page.
4. Select the **HAZOP** tab, and then select **Hazop-DL-Testing-01**.

   The **Analysis Summary** workspace appears, displaying the risk graph. The two Systems/Nodes, Node-01 and Node-02, appear in the left pane.



5. In the left pane, select **Node-01**, and then select the **Hazards worksheet** tab.

   The **Hazards worksheet** section appears, displaying the hierarchical structure of the elements in Node-01.



About the APM Strategy Data Loaders

This topic provides a list of all the APM Strategy Data Loaders.

About the Asset Strategy Management (ASM) Data Loaders

The Asset Strategy Management (ASM) and Asset Strategy Management (ASM) Templates Data Loaders serve the following purposes:

- Provides functional equivalence with Meridium APM V3.x to enable existing or new Asset Strategies and Templates to be imported into the ASM module for further development, analysis, or implementation.
- Provides customers with a more effective GE Digital APM experience because the loaded content will be searchable and usable within the various GE Digital APM modules.
- Enables the user to upload Asset Strategies for storage and to create templates in ASM that can be applied to one or more assets as a repeatable process, or to upload existing Asset Templates that can be applied to assets.

Following the data load, you can access the imported data, which will contain details such as when it was uploaded, and by whom it was created. You can open the imported strategies and templates in ASM and start using them in your workflows.

About the Asset Strategy Management (ASM) Data Loaders Requirements

To use the Asset Strategy Management (ASM) Data Loader and the Asset Strategy Management (ASM) Templates Data Loader, your organization must have completed fully the deployment of the Asset Strategy module. The Asset Strategy Management (ASM) Data Loaders should only be used after the Asset Strategy module has been implemented and you have defined the appropriate Site References, Process Units (Functional Location records), and assets (Equipment records) for your organization.

Risk Mapping

The Asset Strategy Management (ASM) Data Loaders rely on Risk Mapping families to ensure that fields on the ASM Strategy and related records are correctly populated with data, and that resulting risk values can be mapped to the Default Risk Matrix.

If you have added custom fields, you must ensure that mappings exist for those fields, or data may not be populated as expected following the data load.

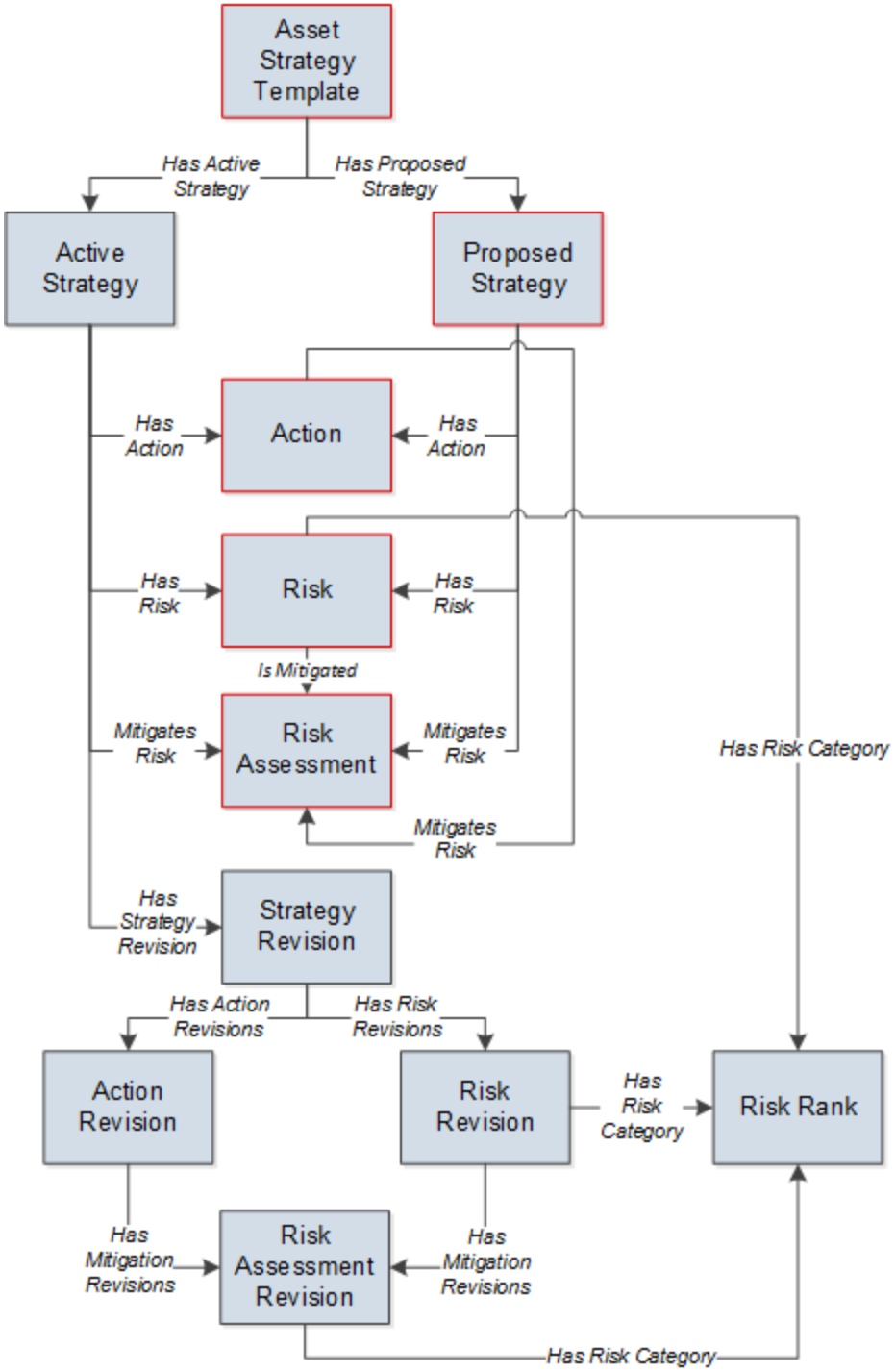
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role, and must also be associated with the MI ASM Analyst Security Group or a Security Role that is associated with this Security Group.

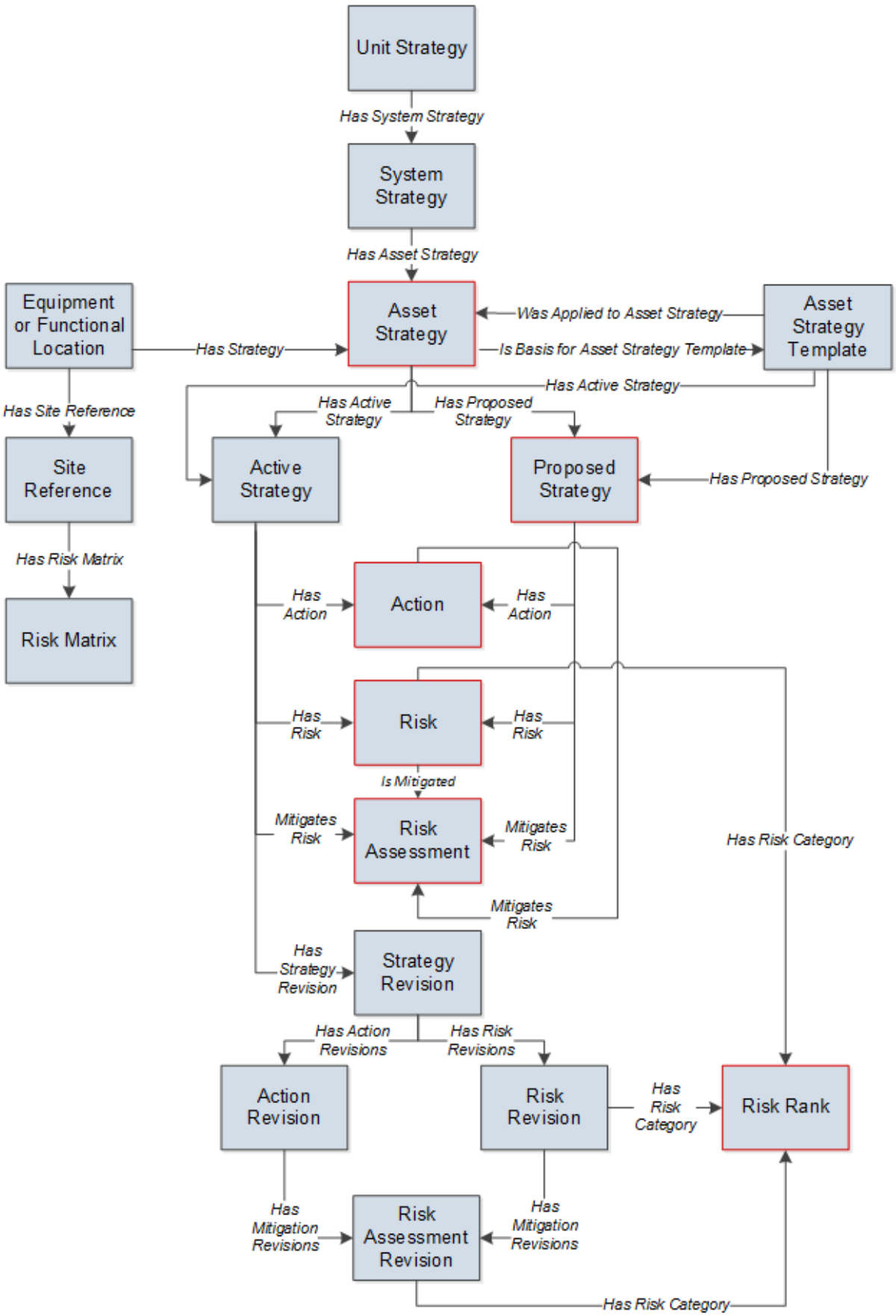
About the Asset Strategy Management (ASM) Data Loaders Data Models

The data for ASM strategies and templates is loaded from Excel workbooks, each containing multiple worksheets. The ASM Template worksheets include Templates, Actions, Risks, and Mitigations, and the ASM Strategy worksheets include Strategies, Actions, Risks, and Mitigations. These elements are highlighted with red boxes around the relevant functional areas from the two ASM data models shown below. Elements shown without a red border are data model elements that will not be loaded by the data loader.

Asset Strategy Management (ASM) Templates Data Loader



Asset Strategy Management (ASM) Data Loader



About the Asset Strategy Management (ASM) Data Loaders General Loading Strategy

Best Practices

When importing data using the Asset Strategy Management (ASM) Data Loaders, you must use the following best practices:

- Do not try to create and update a component in the same Excel workbook.
- *Do not include anything in the Excel workbook that you do not want imported into the dataset.* If you include fields that are blank, they will import into the database as blank fields. If you do not want a specific field imported because it would over-write a value in an existing field, remove that column from the worksheet.

Load Sequence

The data loader jobs must load in a specific sequence in order to successfully populate fields, create records, and link them to the predecessor and/or successor records. This section documents the order of steps that you must perform for the strategy and template data loaders to work correctly.

Asset Strategy Management (ASM) Data Loader

For all strategies, the strategy data loader will:

- Create the *ASM Strategy* and link it to the defined asset through the *Has Strategy* relationship.
- Create *Actions*: One or many that are linked to the Asset Strategy through the *Has Actions* relationship.
- Create *Risks*: One or many that are linked to a mitigating Action through the *Has Actions* relationship.
- Create *Mitigations*: One or many Mitigated Risk Assessments that are linked to one or more Risks through the *Is Mitigated* relationship.

Asset Strategy Management (ASM) Templates Data Loader

For all templates, the template data loader will:

- Create the *ASM Template* without any defined asset.
- Create *Actions*: One or many that are linked to the template through the *Has Actions* relationship.
- Create *Risks*: One or many that are linked to a mitigating Action through the *Has Actions* relationship.
- Create *Mitigation*: One or many Mitigated Risk Assessments that are linked to one or more Risks through the *Is Mitigated* relationship.

Note: Verify that all data was successfully uploaded and all relationships have been created or preserved.

About the Asset Strategy Management (ASM) Data Loaders Workbook Layout and Use

In order to import data using the Asset Strategy Management (ASM) Data Loaders, GE Digital provides Excel workbooks, **Asset Strategy Management (ASM).xlsx** and **Asset Strategy Management (ASM) Templates.xlsx**, which support baseline ASM in GE Digital APM. These workbooks must be used to perform the data load. You can modify the Excel workbook to include custom fields used by your organization. The following tables list the worksheets that are included in the workbooks and then the fields in the corresponding worksheets for both the Strategy and Template Data Loaders.

Asset Strategy Management (ASM) Data Loader

Worksheet	Description
Strategies	This worksheet is used to specify new or existing strategies to which Action, Risks, and Mitigations will be linked.
Actions	This worksheet is used to specify Action records that will be updated or created and linked to assets.
Risks	This worksheet is used to specify Risk records that will be updated or created and linked to assets.
Mitigations	This worksheet is used to define Mitigation records that will be linked to Analyses.

Strategies Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Character (255)	This field is the master reference column for each of the four tabs in the data loader spreadsheet.
Asset ID	ASSET_ID_CHR	Character (255)	This field allows the user to enter values to search for an asset.
Asset Family ID	ASSET_FAMILY_ID	Character (15)	This field allows the user to enter values to search for an asset.
Asset ID Field	ASSET_ID_FIELD	Character (255)	This field allows the user to enter values to search for an asset.

Field Caption	Field ID	Data Type (Length)	Comments
CMMS ID	ASSET_CMMS_ID	Character (255)	This field allows the user to enter values to search for an asset.
CMMS Value	ASSET_CMMS_VALUE	Character (255)	This field allows the user to enter values to search for an asset.
Strategy Notes	MI_ASTSTRAT_NOTES_T	Text	None
Risk Analysis Type	MI_ASTSTRAT_RISK_ANAL_TYPE_C	Character (255)	None
Quantitative Result	MI_ASTSTRAT_QUANT_RESUL_T	Text	None
Plan Length	MI_ASTSTRAT_PLAN_LENGTH_N	Numeric	None

Actions Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Character (255)	This field is the master reference column for each of the four tabs in the data loader spreadsheet.
Action ID	MI_ACTION_ID_C	Character (255)	This field is used to look up existing Actions, and if none are found, a new Action will be created.
Name	MI_ACTION_SHORT_DESC_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Description	MI_ACTION_DESCRIPTION_T	Text	None
Basis	MI_ACTION_BASIS_C	Character (255)	None
Type	MI_ACTION_TYPE_C	Character (255)	None
Condition Monitoring Type	MI_ACTION_CM_TYPE_C	Character (50)	None
Interval	MI_ACTION_INTV_N	Numeric	None
Interval Unit	MI_ACTION_INTV_UNITS_C	Character (50)	None
Resource Cost	MI_ACTION_RESOURCE_COST_N	Numeric	None
Shutdown Required	MI_ACTION_SHUTDOWN_L	Boolean	None

Risks Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Character (255)	This field is used as the master reference column for each of the four tabs in the data loader spreadsheet.

Field Caption	Field ID	Data Type (Length)	Comments
Risk ID	MI_RISKASSE_ID_C	Numeric	This field is used to look up existing Risks, and if none are found a new Risk will be created.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
(SAFETY) Protection Level	SAFETY|MI_PROT_N	Numeric	None
Basis for Assessment	MI_RISKASSE_BASIS_T	Text	None
Condition	MI_FAILRISK_CODE3_C	Character (50)	None
Description	MI_FAILRISK_DESC_T	Text	None
Driving Unmitigated Risk Alias	MI_RISKASSE_DRIV_RISK_ALIAS_C	Character (50)	None
Estimated Repair Time	MI_FAILRISK_EST_REP_TIME_N	Numeric	None
Failure Cause	MI_FAILRISK_CODE4_C	Character (50)	None
Failure Mode	MI_FAILRISK_CODE1_C	Character (255)	None
Failure Without Replacement	MI_FAILRISK_FAIL_WITH_REPL_F	Boolean	None
Is Active	MI_FAILRISK_IS_ACTIV_F	Boolean	None

Field Caption	Field ID	Data Type (Length)	Comments
Is Latent	MI_FAILRISK_IS_LATEN_F	Boolean	None
Last Failure	MI_FAILRISK_LAST_FAILU_D	Date	None
Maintainable Item	MI_FAILRISK_CODE2_C	Character (50)	None
Name	MI_RISKASSE_NAME_C	Character (515)	None
Number of Sub-components	MI_FAILRISK_NUMB_OF_SUBC_N	Numeric	None
Percentage of PF Interval to Wait	MI_FAILRISK_PER_OF_PF_INT_N	Numeric	None
PF Interval	MI_FAILRISK_PF_INTER_N	Character (50)	None
PF Interval Units	MI_FAILRISK_PF_INTER_UNITS_C	Character (50)	None
Planned Cor-rection Cost	MI_FAILRISK_PLAN_CORR_COST_N	Numeric	None
Planned Cor-rection Duration	MI_FAILRISK_PLAN_CORR_DURA_N	Numeric	None
Repair Imme-diately	MI_FAILRISK_REPAI_IMMED_F	Boolean	None
Risk Basis	MI_RISKASSE_RISK_BASIS_C	Character (255)	None
Unmitigated Risk Alias	MI_RISKASSE_RISK_ALIAS_C	Character (50)	None

Field Caption	Field ID	Data Type (Length)	Comments
Wear Pattern	MI_FAILRISK_WEAR_PATTE_C	Character (50)	None

Mitigations Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Numeric	This field is used as the master reference column for each of the four tabs in the data loader spreadsheet.
Risk ID	MI_RISKASSE_ID_C	Character (265)	This field is used to look up existing Risks to which the Mitigations will be linked.
Action ID	MI_ACTION_ID_C	Character (265)	This field is used to lookup existing Actions to which the Mitigations will be linked.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
(SAFETY) Protection Level	SAFETY|MI_PROT_N	Numeric	None
Basis for Assessment	MI_RISKASSE_BASIS_T	Text	None

Asset Strategy Management (ASM) Templates Data Loader

Worksheet	Description
Templates	This worksheet is used to specify new or existing templates to which Action, Risks, and Mitigations will be linked.
Actions	This worksheet is used to specify Action records that will be updated or created and linked to templates.
Risks	This worksheet is used to specify Risk records that will be updated or created and linked to templates.
Mitigations	This worksheet is used to define Mitigation records that will be linked to Analyses.

Templates Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_ASTSTRAT_ID_C	Character (255)	This field is the master reference column for each of the four tabs in the data loader spreadsheet.
Template Notes	MI_ASTSTRAT_NOTES_T	Text	None
Risk Matrix Name	TEMPLATE_RISK_MATRIX_NAME	Character (255)	None
Template Category	MI_ASTSTTMP_GEN_FIELD_1_C	Character (255)	None
Criticality	MI_ASTSTTMP_GEN_FIELD_2_C	Character (255)	None
Duty	MI_ASTSTTMP_GEN_FIELD_3_C	Character (255)	None
Service	MI_ASTSTTMP_GEN_FIELD_4_C	Character (255)	None

Actions Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Character (255)	This field is the master reference column for each of the four tabs in the data loader spreadsheet.
Action ID	MI_ACTION_ID_C	Character (255)	This field is used to look up existing Actions, and if none are found, a new Action will be created.
Name	MI_ACTION_SHORT_DESC_C	Character (255)	None
Description	MI_ACTION_DESCRIPTION_T	Text	None
Basis	MI_ACTION_BASIS_C	Character (255)	None
Type	MI_ACTION_TYPE_C	Character (255)	None
Condition Monitoring Type	MI_ACTION_CM_TYPE_C	Character (50)	None
Interval	MI_ACTION_INTV_N	Numeric	None
Interval Unit	MI_ACTION_INTV_UNITS_C	Character (50)	None
Resource Cost	MI_ACTION_RESOURCE_COST_N	Numeric	None
Shutdown Required	MI_ACTION_SHUTDOWN_L	Boolean	None

Risks Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Character (255)	This field is used as the master reference column for each of the four tabs in the data loader spreadsheet.
Risk ID	MI_RISKASSE_ID_C	Numeric	This field is used to look up existing Risks, and if none are found a new Risk will be created.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
(SAFETY) Protection Level	SAFETY|MI_PROT_N	Numeric	None
Basis for Assessment	MI_RISKASSE_BASIS_T	Text	None
Condition	MI_FAILRISK_CODE3_C	Character (50)	None
Description	MI_FAILRISK_DESC_T	Text	None
Driving Unmitigated Risk Alias	MI_RISKASSE_DRIV_RISK_ALIAS_C	Character (50)	None
Estimated Repair Time	MI_FAILRISK_EST_REP_TIME_N	Numeric	None
Failure Cause	MI_FAILRISK_CODE4_C	Character (50)	None
Failure Mode	MI_FAILRISK_CODE1_C	Character (255)	None

Field Caption	Field ID	Data Type (Length)	Comments
Failure Without Replacement	MI_FAILRISK_FAIL_WITH_REPL_F	Boolean	None
Is Active	MI_FAILRISK_IS_ACTIV_F	Boolean	None
Is Latent	MI_FAILRISK_IS_LATEN_F	Boolean	None
Last Failure	MI_FAILRISK_LAST_FAILU_D	Date	None
Maintainable Item	MI_FAILRISK_CODE2_C	Character (50)	None
Name	MI_RISKASSE_NAME_C	Character (515)	None
Number of Sub-components	MI_FAILRISK_NUMB_OF_SUBC_N	Numeric	None
Percentage of PF Interval to Wait	MI_FAILRISK_PER_OF_PF_INT_N	Numeric	None
PF Interval	MI_FAILRISK_PF_INTER_N	Character (50)	None
PF Interval Units	MI_FAILRISK_PF_INTER_UNITS_C	Character (50)	None
Planned Cor-rection Cost	MI_FAILRISK_PLAN_CORR_COST_N	Numeric	None
Planned Cor-rection Duration	MI_FAILRISK_PLAN_CORR_DURA_N	Numeric	None
Repair Imme-diately	MI_FAILRISK_REPAI_IMMED_F	Boolean	None

Field Caption	Field ID	Data Type (Length)	Comments
Risk Basis	MI_RISKASSE_RISK_BASIS_C	Character (255)	None
Unmitigated Risk Alias	MI_RISKASSE_RISK_ALIAS_C	Character (50)	None
Wear Pattern	MI_FAILRISK_WEAR_PATTE_C	Character (50)	None

Mitigations Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Strategy ID	MI_ASTSTRAT_ID_C	Numeric	This field is used as the master reference column for each of the four tabs in the data loader spreadsheet.
Risk ID	MI_RISKASSE_ID_C	Character (265)	This field is used to look up existing Risks to which the Mitigations will be linked.
Action ID	MI_ACTION_ID_C	Character (265)	This field is used to lookup existing Actions to which the Mitigations will be linked.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(ENVIRONMENT) Protection Level	ENVIRONMENT|MI_PROT_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(FINANCIAL) Protection level	FINANCIAL|MI_PROT_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(OPERATIONS) Protection Level	OPERATIONS|MI_PROT_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(SAFETY) Protection Level	SAFETY|MI_PROT_N	Numeric	None
Basis for Assessment	MI_RISKASSE_BASIS_T	Text	None

About the Asset Strategy Management (ASM) Data Loaders Load Verification

A successful data import will have the same effect as creating a new Asset Strategy or Strategy Template in GE Digital APM. Following a successful data load, if the data loader created a new strategy or template, it will appear in the **Asset Strategies** section or the **Templates** section on the **Strategy Management Overview** page.

A successful import can also be defined as an event in which partial data on a worksheet was loaded into GE Digital APM, and where the user was given appropriate messaging that enabled him or her to identify and correct issues resulting from the import.

About the Failure Modes and Effects Analysis (FMEA) Data Loaders

The Failure Modes and Effects Analysis (FMEA) Data Loader, Failure Modes and Effects Analysis (FMEA) Asset Templates Data Loader, and Failure Modes and Effects Analysis (FMEA) Analysis Templates Data Loader allow a user to load full FMEA analyses, analysis templates, and asset templates from data in fixed format Excel workbooks. The Excel workbooks contain worksheets that contain data to populate various nodes/records in the populated data model.

About the Failure Modes and Effects Analysis (FMEA) Data Loaders Requirements

The following data must be present prior to loading FMEA data:

1. Equipment Taxonomy
2. Equipment and Functional Location records

Note: There is no requisite data that must be present in order to load FMEA Asset Template or FMEA Analysis Template records.

Mapping

The Failure Modes and Effects Analysis (FMEA) Data Loaders map the datasheet columns in the Excel workbook to fields in GE Digital APM families by position. The captions may be changed as needed, but the column positions should not be moved.

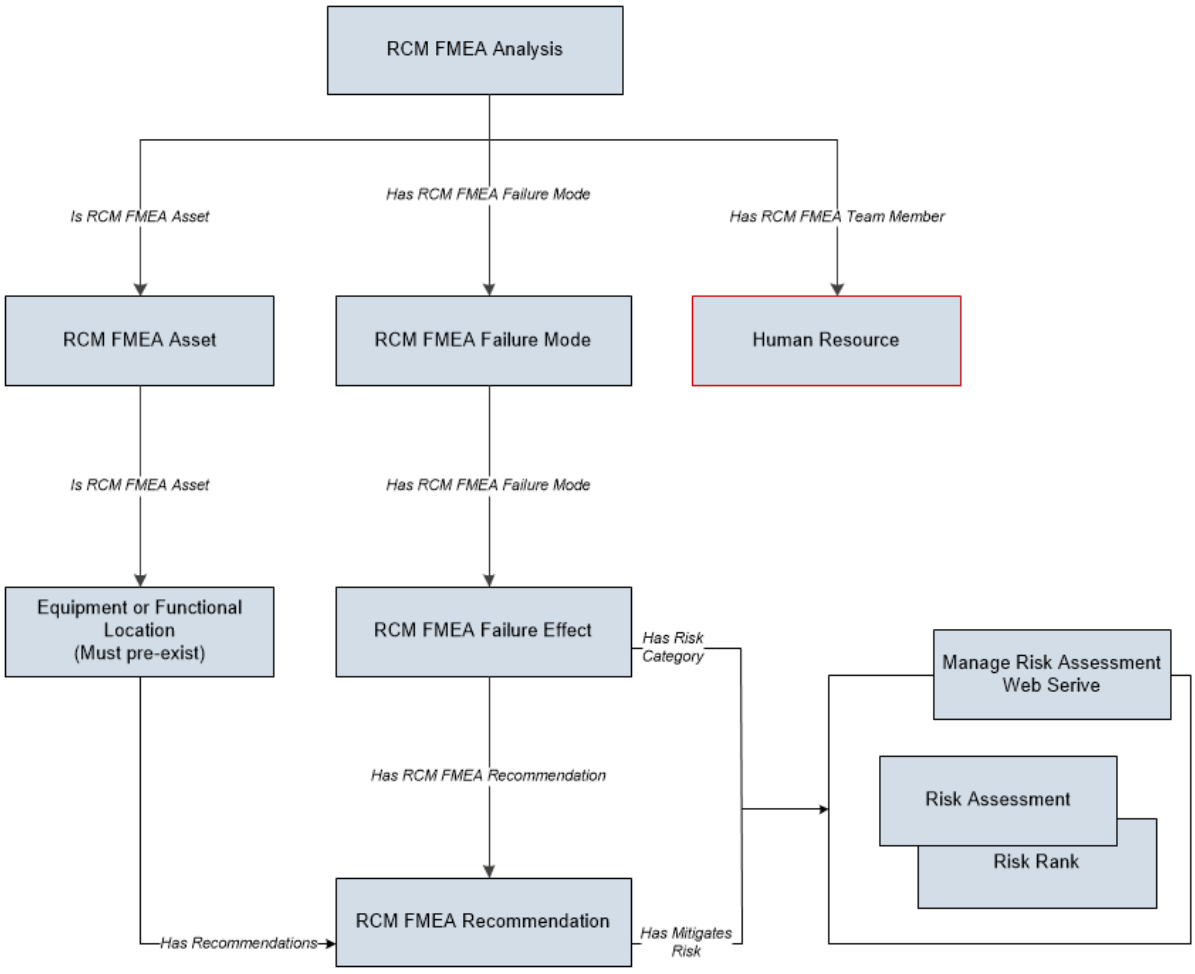
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role as well as the MI Strategy Admin role or MI Strategy User role.

About the Failure Modes and Effects Analysis (FMEA) Data Loaders Data Model

The data for FMEA families is loaded from Excel workbooks containing multiple worksheets each. This includes Analysis, Team Members, Assets, Failure Modes, Failure Effects, and Recommendations.

Note: Elements outlined in red are not loaded by the data loaders.



About the Failure Modes and Effects Analysis (FMEA) Data Loaders General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Load Sequence

The FMEA data loads must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records:

Failure Modes and Effects Analysis (FMEA) Data Loader

1. Create or update RCM FMEA Analysis of type FMEA.
2. Link the Existing Team Members to the Analysis. Team members exist in the Human Resource family and must exist prior to the load.
3. Create or update an RCM FMEA Asset and link it to the analysis.
    a. Locate the physical asset (Equipment or FLOC) and link it to the RCM FMEA Asset.
4. Create or update a Failure Mode and link it to the Analysis.
5. Create or update a Failure Effect and link it to the Failure Mode.
    a. Create the Unmitigated Risk Assessment and Risk Rank records and link to the Failure Effect.
6. Create or update the RCM FMEA Recommendation and link it to the associated Failure Effect.
    a. Create the Mitigated Risk Assessment and Risk Rank records and link to the Failure Effect.

Failure Modes and Effects Analysis (FMEA) Asset Templates Data Loader

1. Create or update an RCM FMEA Template and link it to an asset.
2. Create or update an RCM FMEA Asset.
3. Create or update a Failure Mode and link it to the asset.
4. Create or update a Failure Effect and link it to the Failure Mode.
5. Create or update the RCM FMEA Recommendation and link it to the associated Failure Effect.

Failure Modes and Effects Analysis (FMEA) Analysis Templates Data Loader

1. Create or update an RCM FMEA Template and link it to an analysis.
2. Create or update RCM FMEA Analysis of type FMEA.
3. Link the Existing Team Members to the Analysis. Team members exist in the Human Resource family and must exist prior to the load.
4. Create or update an RCM FMEA Asset and link it to the analysis.
5. Create or update a Failure Mode and link it to the Analysis.
6. Create or update a Failure Effect and link it to the Failure Mode.
7. Create or update the RCM FMEA Recommendation and link it to the associated Failure Effect.

Risk Assessment Management and Web Service

FMEA and RCM have mitigated and unmitigated risk assessments for Failure Effects and Recommendations respectively. Each Risk Assessment has related Risk Rank records which is in essence a sub-model. The FMEA loaders use the Risk Assessment service to manage the Risk Assessment and underlying Risk Rank records.

Note: Any changes here should be reflected in the Strategy RCM Mappings Document.

Special Note on Failure Effect

The Failure Effect also acts as the Risk Assessment record. Review the Failure Effect web service and you will see that the manage operation creates a Risk Rank collection. There is no need to create an additional Risk Assessment record linked to the Failure Effect.

Special Note on RCM FMEA Recommendation

The Recommendation will need to have a linked Risk Assessment record if there are mitigated values in the worksheet. The loader should locate the Risk Assessment record linked to the Recommendation. If one exists, then update it.

If one does not exist, then use the Risk Assessment web service to create it and use the relationship Mitigates Risk [MIR_MITRISK] to relate it to the Recommendation.

Special Note on Risk Assessment ID Field

You can use any combination of fields to uniquely identify the record, you are not limited to ID. The ID on the Risk Assessment record has no purpose but the Web Service requires it.

If the service requires an ID, then auto-generate is used with the understanding that it will not be used to perform a lookup.

There are two entities and each has two scenarios with regards to the Risk Assessment. None of them require an ID since no attempt is being made to find a risk assessment by ID.

Entity	Scenario	Processing Assumptions	Additional Validation and Integrity Logic
Failure Effect	Unmitigated (Create new assessment)	Since the Failure Effect is the Risk Assessment, there is no need to create a Risk Assessment record.	The unmitigated fields on the Failure Effect Record should not be null if the user is loading RCM FMEA recommendations that have a mitigated risk rank. When created through the UI, the recommendation always inherits the unmitigated Risk Assessment from the failure effect and thus we could be creating a situation where there are mitigated Risks without corresponding Unmitigated Risks. Conversely, a recommendation cannot have a Risk Assessment whose Failure Effect does not have one Risk Assessment, or else an out of sync condition will be created.
Failure Effect	Unmitigated (Update assessment)	Update the unmitigated risk fields on the failure effect	
RCM FMEA Recommendation	Mitigated (Create new assessment)	Check if there is an existing *mitigated* risk assessment linked to the Recommendation. There can only be one. If none exists, then we create it.	
RCM FMEA Recommendation	Mitigated (Update assessment)	Check if there is an existing *mitigated* risk assessment linked to the Failure Effect. If *one does exist* then update the risk assessment.	

About the Failure Modes and Effects Analysis (FMEA) Data Loader Workbooks Layout and Use

This section provides a high-level overview and explanation of how the FMEA data loader workbooks are constructed.

In order to import data using the Failure Modes and Effects Analysis (FMEA) Data Loaders, GE Digital provides Excel workbooks, **Failure Modes and Effects Analysis (FMEA).xlsx**, **FMEA_Asset_Template_Data_Loader.xlsx**, and **FMEA_Analysis_Template_Data_Loader.xlsx**, which support baseline data loading of FMEA analyses, FMEA asset templates, and FMEA analysis templates, in GE Digital APM. These workbooks must be used to perform the data load.

The following table lists the worksheets that are included in the Failure Modes and Effects Analysis (FMEA) Data Loader workbook.

Failure Modes and Effects Analysis (FMEA) Data Loader

Worksheet	Description
Analysis	The analysis is the root record in the data model and is created first. Links to other records are established after the child record is created.
Team Members	This worksheet is used to load team members data for the analysis. Team members are linked to the FMEA Analysis through the *Has RCM FMEA Team Member* relationship. **Note:** If the user wants to add team members, the individuals must already have an entry in GE Digital APM.
Assets	This worksheet is used to load data into the various assets linked to the Analysis record. The FMEA Asset is a virtual asset that links the actual equipment or functional location to the analysis. This node must be created and linked to the analysis using information from the asset ID.
Failure Modes	This worksheet is used to load data into the Failure Mode family node. The FMEA Failure Mode is linked directly to the virtual asset.

Worksheet	Description
Failure Effects	This worksheet is used to load data into the Failure Effect family node. The Failure Effect is linked to both the Failure Mode and the associated Recommendation record. See the Recommendations section for its relationship.
Recommendations	This worksheet is used to load data into the Recommendations. FMEA Recommendations are linked to the associated Failure Effects. Failure Effect can have multiple recommendations, but each one must be unique.

Analysis Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Analysis Long Description	MI_AN_LONG_DESCR_TX	Text	None
Start Date	MI_AN_ANALY_START_DATE_DT	Date	None
End Date	MI_AN_ANALY_END_DATE_DT	Date	None
Re-Evaluation Date	MI_RCMANALY_ANALY_REEV_D	Date	None

Team Members Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
User ID	SEUS_ID	Character (255)	This is a key field.

Relationship:

Predecessor	Relationship	Successor
MI_RCMANALY	MIR_HRCMTMMEM	MI Human Resource

Assets Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	Used to locate Analysis.
Asset ID Value	ASSET_ID_CHR	Character (255)	This is a key field.
Asset ID Field	ASSET_FIELD_ID	Character (255)	This is a key field.
Asset Family ID	ASSET_FAMILY_ID	Character (255)	Used to determine which MI family to create, by identifying whether the Asset is an Equipment or Functional Location. The valid values are: • MI_EQUIP000 • MI_FNCLOC00
CMMS ID	ASSET_CMMS_ID	Character (255)	None
CMMS Value	ASSET_CMMS_VALUE	Character (255)	None

Relationships:

Predecessor	Relationship	Successor
MI_RCMANALY	MIR_HRCMEQP	MI_RCMEQPMT

Predecessor	Relationship	Successor
MI_EQUIP000	MIR_IRCMEQP	MI_RCMEQPMT
MI_FNCLOC00	MIR_IRCMEQP	MI_RCMEQPMT

Failure Mode Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Asset ID Value	ASSET_ID_CHR	Character (255)	This is a key field.
Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Long Description	MI_RCMFMODE_LNG_DESC_T	Text	None
Maintainable Item	MI_RCMFMODE_MAINT_ITEM_C	Character (50)	None
Damage Code	MI_RCMFMODE_CONDI_DAMA_C	Character (50)	
Failure Pattern	MI_RCMFMODE_FAIL_SHP_FACT_C	Character (40)	None
PF Interval	MI_RCMFMODE_PF_INTER_N	Numeric	None
PF Interval Units	MI_RCMFMODE_PF_INTER_UNITS_C	Character (40)	None

Relationships:

Predecessor	Relationship	Successor
MI_RCMEQPMT	MIR_HRCMFMD	MI_RCMFMODE

Failure Effects Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	None
Effect Long Description	MI_RCMFEFFT_LNG_DESC_T	Text	None
Effect Impact	MI_RCMFEFFT_EFF_IMPACT_C	Character (40)	None
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Relationships:

Predecessor	Relationship	Successor
MI_RCMFMODE	MIR_HRCMFEF	MI_RCMFEFFT

Recommendations Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	This is a key field.
Headline	MI_REC_SHORT_DESCR_CHR	Character (255)	None
Description	MI_REC_LONG_DESCR_TX	Text	None
Business Impact	MI_REC_IMPAC_CHR	Character (100)	None
Shutdown Required?	MI_RECRCM_SYS_SHUTDN_REQ_L	L	None
Target Com-pletion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	None
Action Type	MI_RECRCM_ACTIO_TYPE_C	Character (5)	None
Interval	MI_RECRCM_INTER_N	Numeric	None
Interval Units	MI_RECRCM_INTER_UNITS_C	Character (50)	None
Nonrecurring	MI_RECRCM_NONRE_L	Logical	Defaults to False when no value.

Field Caption	Field ID	Data Type (Length)	Comments
Performance Interval	MI_RECRCM_ PERFO_INTER_N	Numeric	None
Performance Interval Units	MI_RECRCM_ PERFO_INTER_ UNITS_C	Character (50)	None
Estimated Cost	MI_RECRCM_ ESTIM_COST_N	Numeric	None
Estimated Cost Basis	MI_RECRCM_COST_ BASIS_C	Character (255)	None
Recommended Resource	MI_RECRCM_ RECOMM_RSRC_C	Character	Must match a resource configured in the system picklist for this field.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_ CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_ PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_ CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_ RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_ PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_ RISK_PROD_LOSS_ N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_ CONSE_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Relationships:

Predecessor	Relationship	Successor
MI_RCMFEFFT	MIR_HRCMREC	MI_RECRCM

Failure Modes and Effects Analysis (FMEA) Asset Templates Data Loader

Worksheet	Description
Assets	This worksheet is used to load data into the various assets linked to the Analysis record. The FMEA Asset is a virtual asset that links the actual equipment or functional location to the analysis. This node must be created and linked to the analysis using information from the asset ID.
Failure Modes	This worksheet is used to load data into the Failure Mode family node. The FMEA Failure Mode is linked directly to the virtual asset.
Failure Effects	This worksheet is used to load data into the Failure Effect family node. The Failure Effect is linked to both the Failure Mode and the associated Recommendation record. See the Recommendations section for its relationship.

Worksheet	Description
Recommendations	This worksheet is used to load data into the Recommendations. FMEA Recommendations are linked to the associated Failure Effects. Failure Effect can have multiple recommendations, but each one must be unique.
Templates	This worksheet is used to load data into the Templates. FMEA Templates are linked to the associated virtual assets, as well as a specific site.

Templates Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Site Reference Name	MI_SITEREF_NAME_C	Character (255)	This is a key field.
Template Short Description	MI_TM000000_SHRT_DSC_C	Character (255)	None
Template Long Description	MI_TM000000_LNG_DSC_T	Text	None

Assets Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Asset Description	MI_RCMEQPMT_DESC_C	Text	None

Failure Modes Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Long Description	MI_RCMFMODE_LNG_DESC_T	Text	None
Maintainable Item	MI_RCMFMODE_MAINT_ITEM_C	Character (50)	None
Damage Code	MI_RCMFMODE_CONDI_DAMA_C	Character (50)	
Failure Pattern	MI_RCMFMODE_FAIL_SHP_FACT_C	Character (40)	None
PF Interval	MI_RCMFMODE_PF_INTER_N	Numeric	None
PF Interval Units	MI_RCMFMODE_PF_INTER_UNITS_C	Character (40)	None

Failure Effects Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	This is a key field.

Field Caption	Field ID	Data Type (Length)	Comments
Effect Long Description	MI_RCMFEFFT_LNG_DESC_T	Text	None
Effect Impact	MI_RCMFEFFT_EFF_IMPACT_C	Character (40)	None
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Recommendations Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	This is a key field.
Headline	MI_REC_SHORT_DESCR_CHR	Character (255)	This is a key field.
Description	MI_REC_LONG_DESCR_TX	Text	None
Business Impact	MI_REC_IMPAC_CHR	Character (100)	None
Shutdown Required?	MI_RECRCM_SYS_SHUTDN_REQ_L	L	None
Target Com-pletion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	None
Action Type	MI_RECRCM_ACTIO_TYPE_C	Character (5)	None
Interval	MI_RECRCM_INTER_N	Numeric	None
Interval Units	MI_RECRCM_INTER_UNITS_C	Character (50)	None
Nonrecurring	MI_RECRCM_NONRE_L	Logical	Defaults to False when no value.

Field Caption	Field ID	Data Type (Length)	Comments
Performance Interval	MI_RECRCM_ PERFO_INTER_N	Numeric	None
Performance Interval Units	MI_RECRCM_ PERFO_INTER_ UNITS_C	Character (50)	None
Estimated Cost	MI_RECRCM_ ESTIM_COST_N	Numeric	None
Estimated Cost Basis	MI_RECRCM_COST_ BASIS_C	Character (255)	None
Recommended Resource	MI_RECRCM_ RECOMM_RSRC_C	Character	Must match a resource configured in the system picklist for this field.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_ CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_ PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_ CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_ RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_ PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_ RISK_PROD_LOSS_ N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_ CONSE_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Failure Modes and Effects Analysis (FMEA) Analysis Templates Data Loader

Worksheet	Description
Templates	This worksheet is used to load data into the Templates. FMEA Templates are linked to the associated virtual assets, which are linked to specific sites.
Analysis	The analysis is the root record in the data model and is created first. Links to other records are established after the child record is created.
Team Members	This worksheet is used to load team members data for the analysis. Team members are linked to the FMEA Analysis through the *Has RCM FMEA Team Member* relationship. **Note:** If the user wants to add team members, the individuals must already have an entry in GE Digital APM.
Assets	This worksheet is used to load data into the various assets linked to the Analysis record. The FMEA Asset is a virtual asset that links the actual equipment or functional location to the analysis. This node must be created and linked to the analysis using information from the asset ID.

Worksheet	Description
Failure Modes	This worksheet is used to load data into the Failure Mode family node. The FMEA Failure Mode is linked directly to the virtual asset.
Failure Effects	This worksheet is used to load data into the Failure Effect family node. The Failure Effect is linked to both the Failure Mode and the associated Recommendation record. See the Recommendations section for its relationship.
Recommendations	This worksheet is used to load data into the Recommendations. FMEA Recommendations are linked to the associated Failure Effects. Failure Effect can have multiple recommendations, but each one must be unique.

Templates Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Site Reference Name	MI_SITEREF_NAME_C	Character (255)	This is a key field.
Template Short Description	MI_TM000000_SHRT_DSC_C	Character (255)	None
Template Long Description	MI_TM000000_LNG_DSC_T	Text	None

Analyses Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Analysis Long Description	MI_AN_LONG_DESCR_TX	Text	None
Start Date	MI_AN_ANALY_START_DATE_DT	Date	None
End Date	MI_AN_ANALY_END_DATE_DT	Date	None
Re-Evaluation Date	MI_RCMANALY_ANALY_REEV_D	Date	None

Team Members Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
User ID	SEUS_ID	Character (255)	This is a key field.

Assets Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Asset Description	MI_RCMEQPMT_DESC_C	Character (255)	None

Failure Modes Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Long Description	MI_RCMFMODE_LNG_DESC_T	Text	None
Maintainable Item	MI_RCMFMODE_MAINT_ITEM_C	Character (50)	None
Damage Code	MI_RCMFMODE_CONDI_DAMA_C	Character (50)	
Failure Pattern	MI_RCMFMODE_FAIL_SHP_FACT_C	Character (40)	None
PF Interval	MI_RCMFMODE_PF_INTER_N	Numeric	None
PF Interval Units	MI_RCMFMODE_PF_INTER_UNITS_C	Character (40)	None

Failure Effects Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.

Field Caption	Field ID	Data Type (Length)	Comments
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	This is a key field.
Effect Long Description	MI_RCMFEFFT_LNG_DESC_T	Text	None
Effect Impact	MI_RCMFEFFT_EFF_IMPACT_C	Character (40)	None
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Recommendations Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Template ID	MI_TM000000_ID	Character (255)	Used to locate template.
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Asset ID	MI_RCMEQPMT_EQUIP_ID_C	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	This is a key field.
Headline	MI_REC_SHORT_DESCR_CHR	Character (255)	This is a key field.
Description	MI_REC_LONG_DESCR_TX	Text	None
Business Impact	MI_REC_IMPAC_CHR	Character (100)	None
Shutdown Required?	MI_RECRCM_SYS_SHUTDN_REQ_L	L	None
Target Com-pletion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	None
Action Type	MI_RECRCM_ACTIO_TYPE_C	Character (5)	None

Field Caption	Field ID	Data Type (Length)	Comments
Interval	MI_RECRCM_INTER_N	Numeric	None
Interval Units	MI_RECRCM_INTER_UNITS_C	Character (50)	None
Nonrecurring	MI_RECRCM_NONRE_L	Logical	Defaults to False when no value.
Performance Interval	MI_RECRCM_PERFO_INTER_N	Numeric	None
Performance Interval Units	MI_RECRCM_PERFO_INTER_UNITS_C	Character (50)	None
Estimated Cost	MI_RECRCM_ESTIM_COST_N	Numeric	None
Estimated Cost Basis	MI_RECRCM_COST_BASIS_C	Character (255)	None
Recommended Resource	MI_RECRCM_RECOMM_RSRC_C	Character	Must match a resource configured in the system picklist for this field.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None

Field Caption	Field ID	Data Type (Length)	Comments
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

About the Reliability Centered Maintenance (RCM) Data Loader

The Reliability Centered Maintenance (RCM) Data Loader allows a user to load a full RCM Analysis from data in a fixed format Excel workbook. The Excel file provides worksheets that contain data to populate various nodes/records in the data model. These include RCM Analysis, Function, Functional Failure, Failure Mode, Failure Effects, Recommendations, mitigated and unmitigated risks, and Team members.

About the Reliability Centered Maintenance (RCM) Data Loader Requirements

The following data must be present prior to loading RCM data:

- Equipment Taxonomy
- Equipment and Functional Location records
- Team Member records

Mapping

The Reliability Centered Maintenance (RCM) Data Loader maps the datasheet columns in the Excel workbook to fields in GE Digital APM families by position. The captions may be changed as needed, but the column positions should not be moved.

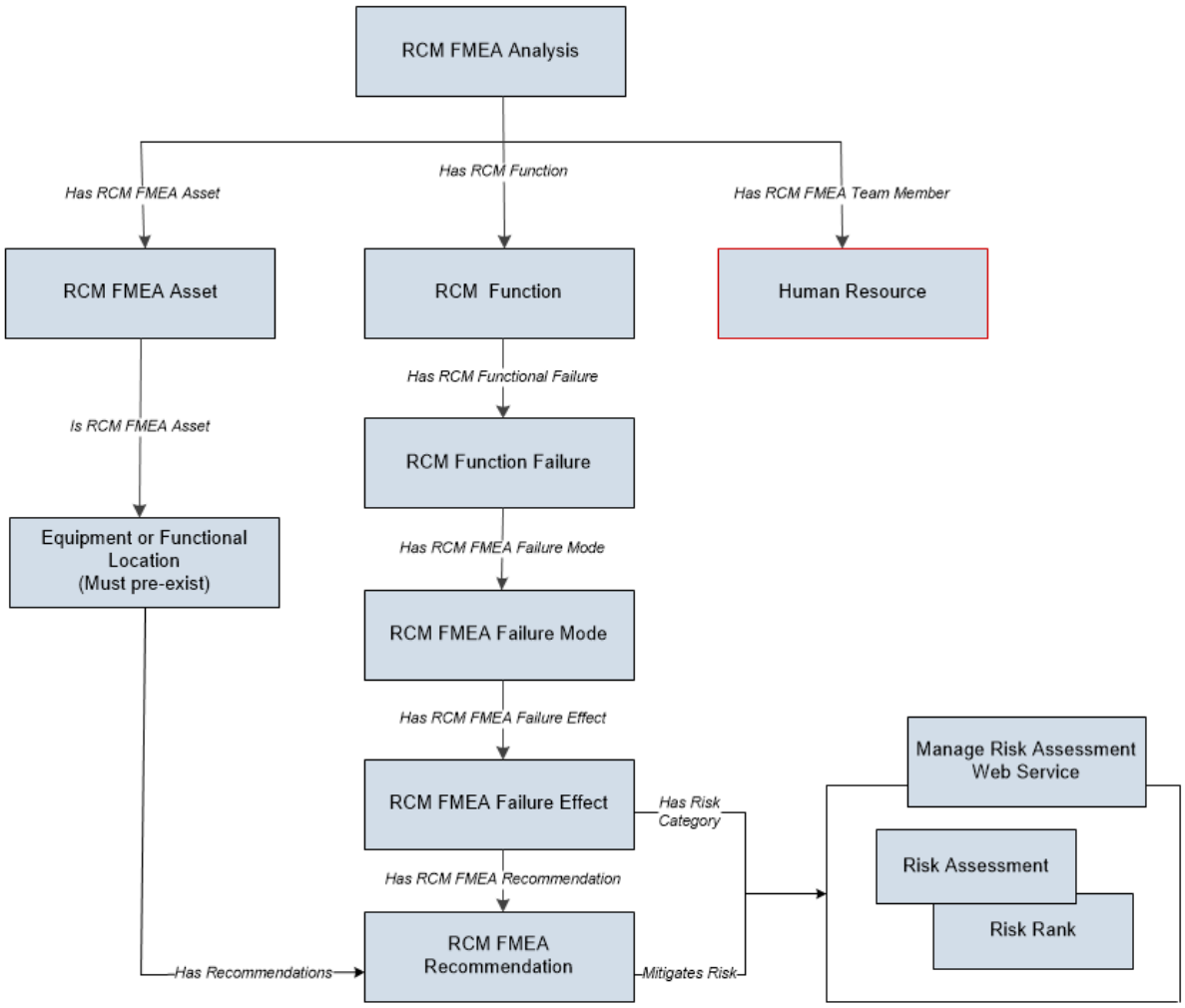
Security Settings

The Security User performing the data load operation must be associated with either the MI Data Loader User or MI Data Loader Admin Security Role as well as the MI Strategy Admin role or MI Strategy User role.

About the Reliability Centered Maintenance (RCM) Data Loader Data Model

The data for Reliability Centered Maintenance (RCM) families is loaded from a single Excel workbook containing multiple worksheets. This includes Analyses, Team Members, Functions, Functional Failures, Failure Modes, Failure Effects, and Recommendations.

Note: Elements outlined in red are not loaded by the data loader.



About the Reliability Centered Maintenance (RCM) Data Loader General Loading Strategy

This section describes any prerequisites to loading the data and the order in which the data will be loaded.

Note: Before reading this section, refer to the Data Model section.

Load Sequence

The RCM data load must be performed in a specific sequence to successfully populate fields, create records, and link them to the predecessor and/or successor records:

1. Create/Update RCM FMEA Analysis of type RCM.
2. Link the Existing Team Members to the Analysis. Team members exist in the Human Resource family and must exist prior to the load.
3. Create/Update an RCM FMEA Asset and link it to the analysis.
    a. Locate the physical asset (Equipment or FLOC) and link it to the RCM FMEA Asset.
4. Create/Update RCM Function to the Analysis.
5. Create/Update RCM Functional Failure to the Function.
6. Create/Update a RCM FMEA Failure Mode to the Functional Failure.
7. Create/Update a Failure Effect and link it to the Failure Mode.
    a. Create the Unmitigated Risk Assessment and Risk Rank Records and Link to the Failure Effect.
8. Create/Update the RCM FMEA Recommendation and Link it to the associated Failure Effect.
    a. Create the Mitigated Risk Assessment and Risk Rank Records and Link to the Failure Effect.

About Reliability Centered Maintenance (RCM) Data Loader Risk Assessment Management and Web Service

FMEA and RCM have mitigated and unmitigated risk assessments for Failure Effects and Recommendations respectively. Each Risk Assessment has related Risk Rank records which is in essence a sub-model. The FMEA loader uses the Risk Assessment service to manage the Risk Assessment and underlying Risk Rank records. Any changes here should be reflected in the Strategy FMEA Mappings Document.

Failure Effect

The Failure Effect also acts as the Risk Assessment record. Review the Failure Effect web service and you will see that the manage operation creates a Risk Ranks collection. There is no need to create an additional Risk Assessment record linked to the Failure Effect.

RCM FMEA Recommendation

The Recommendation will need to have a linked Risk Assessment record if there are mitigated values in the worksheet. The data loader should locate the Risk Assessment record linked to the Recommendation. If one exists, then update it.

If one does not exist, then use the Risk Assessment web service to create it and use the relationship Mitigates Risk [MIR_MITRISK] to relate it to the Recommendation.

Risk Assessment ID Field

You can use any combination of fields to uniquely identify the record, you are not limited to ID. The ID on the Risk Assessment record has no purpose but the Web Service requires it.

If the service requires an ID, then auto-generate is used with the understanding that it will not be used to do a lookup.

There are two entities and each has two scenarios with regards to the Risk Assessment. None of them require an ID since no attempt is being made to find a risk assessment by ID.

Entity	Scenario	Processing Assumptions	Additional Validation and Integrity Logic
Failure Effect	Unmitigated (Create new assessment)	Since the Failure Effect is the Risk Assessment, there is no need to create a Risk Assessment record.	The unmitigated fields on the Failure Effect Record should not be null if the user is loading RCM FMEA recommendations that have a mitigated risk rank. When created through the UI, the recommendation always inherits the unmitigated Risk Assessment from the failure effect and thus we could be creating a situation where there are Mitigated Risks without corresponding Unmitigated Risks. Conversely, a recommendation cannot have a Risk Assessment whose Failure Effect does not have one Risk Assessment, or else an out of sync condition will be created.
Failure Effect	Unmitigated (Update - assessment Exists)	Update the unmitigated risk fields on the failure effect	
RCM FMEA Recommendation	Mitigated (Create new assessment)	Check if there is an existing *mitigated* Risk Assessment linked to the Recommendation. There can only be one. If none exists, then one is created.	
RCM FMEA Recommendation	Mitigated (Update - assessment Exists)	Check if there is an existing *mitigated* risk assessment linked to the Failure Effect. If *one does exist* then update the Risk Assessment.	

About Reliability Centered Maintenance (RCM) Data Loader Workbook Layout and Use

This section provides a high-level overview and explanation of how the data loader workbook is constructed.

In order to import data using the Reliability Centered Maintenance (RCM) Data Loader, GE Digital provides an Excel workbook, **Reliability Centered Maintenance (RCM).xlsx**, which supports baseline data loading RCM analysis in GE Digital APM.

The following table lists the worksheets that are included in the Reliability Centered Maintenance (RCM) Data Loader workbook.

Worksheet	Description
Analysis	The analysis is the root record in the data model and is created first. Links to other records are established after the child record is created.
Team Members	This worksheet is used to load data into the team members for the analysis. Team members are linked to the FMEA Analysis through the *Has RCM FMEA Team Member* relationship. **Note**: If the user wants to add team members, the individuals must already have an entry in GE Digital APM.
Functions	This worksheet is used to load data into the Functions for the analysis.
Functional Failures	This worksheet is used to load data into the Function Failures for the analysis.
Failure Modes	This worksheet is used to load data into the Failure Mode family node. The FMEA failure mode is linked directly to the virtual asset.
Failure Effects	This worksheet is used to load data into the Failure Effect family node. The failure effect is linked to both the Failure Mode and the associated recommendation. See the recommendation section for its relationship.
Recommendations	This worksheet is used to load data into the Recommendations. RCM Recommendations are linked to the associated Failure Effects. A Failure Effect can have multiple recommendations but each one must be unique.

Analysis Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Analysis Long Description	MI_AN_LONG_DESCR_TX	Character (255)	None
Start Date	MI_AN_ANALY_START_DATE_DT	Date	None
End Date	MI_AN_ANALY_END_DATE_DT	Date	None
Re-Evaluation Date	MI_RCMANALY_ANALY_REEV_D	Date	None

Team Members Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
User ID	SEUS_ID	Character (255)	This is a key field.

Relationship:

Predecessor	Relationship	Successor
MI_RCMANALY	MIR_HRCMTMMEM	MI Human Resource

Functions Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.

Field Caption	Field ID	Data Type (Length)	Comments
Function Name	MI_RCMFUNCN_NAME_C	Character (255)	This is a key field.
Function Type	MI_RCMFUNCN_TYPE_C	Character (40)	None
Sub Function	MI_RCMFUNCN_SUB_FUNCT_C	Character (50)	None
Function Long Description	MI_RCMFUNCN_LNG_DESC_T	Text	None
Function Performance Parameters	MI_RCMFUNCN_PRI_VAR_T	Text	None

Relationship:

Predecessor	Relationship	Successor
MI_RCMANALY	MIR_HRCMFNC	MI_RCMFUNCN

Functional Failures Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Function Name	MI_RCMFUNCN_NAME_C	Character (255)	This is a key field. Used to locate the Function ID for the Analysis.
Function Failure Name	MI_RCMFFAIL_NAME_C	Character (255)	This is a key field.
Functional Long Description	MI_RCMFFAIL_LNG_DESC_T	Text	None

Failure Modes Worksheet

Field Caption	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Function Failure Name	MI_RCMFFAIL_NAME_C	Character (255)	This is a key field.
Failure Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Asset ID Value	ASSET_ID_CHR	Character (50)	This is a key field.
Asset ID Field	ASSET_FIELD_ID	Character	This is a key field.
Asset Family ID	ASSET_FAMILY_ID	Character	This is a key field.
CMMS ID	ASSET_CMMS_ID	Character	None
CMMS Value	ASSET_CMMS_VALUE	Character (50)	None
Long Description	MI_RCMFMODE_LNG_DESC_T	Text	None
Maintainable Item	MI_RCMFMODE_MAINT_ITEM_C	Character (50)	None
Damage Code	MI_RCMFMODE_CONDI_DAMA_C	Character (50)	None
Failure Pattern	MI_RCMFMODE_FAIL_SHP_FACT_C	Character (40)	None
PF Interval	MI_RCMFMODE_PF_INTER_N	Numeric	None
PF Interval Units	MI_RCMFMODE_PF_INTER_UNITS_C	Character (40)	None

Relationships:

Predecessor	Relationship	Successor	Comment
MI_ RCMEQPMT	MIR_ HRCMFMD	MI_ RCMFMODE	Links to Equipment RCM FMEA Asset
MI_ RCMFUNCN	MIR_HRCMFFL	MI_ RCMFMODE	Links Failure Mode to RCM Function

Failure Effects Worksheet

Source Field Name	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Mode Name	MI_RCMFMODE_NAME_C	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	None
Effect Long Description	MI_RCMFEFFT_LNG_DESC_T	Text	None
Effect Impact	MI_RCMFEFFT_EFF_IMPACT_C	Character (40)	None
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_RISK_MAIN_COST_N	Numeric	None
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None

Source Field Name	Field ID	Data Type (Length)	Comments
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Relationships:

Predecessor	Relationship	Successor
MI_RCMFMODE	**MIR_HRCMFEF**	MI_RCMFEFFT

Recommendations Worksheet

Source Field Name	Field ID	Data Type (Length)	Comments
Analysis Short Description	MI_AN_SHORT_DESCR_CHR	Character (255)	This is a key field.
Effect Name	MI_RCMFEFFT_NAME_C	Character (255)	This is a key field.
Headline	MI_REC_SHORT_DESCR_CHR	Character (255)	None
Description	MI_REC_LONG_DESCR_TX	Text	None
Business Impact	MI_REC_IMPAC_CHR	Character (100)	None
Shutdown Required?	MI_RECRCM_SYS_SHUTDN_REQ_L	Boolean	None
Target Completion Date	MI_REC_TARGE_COMPL_DATE_DT	Date	None

Source Field Name	Field ID	Data Type (Length)	Comments
Action Type	MI_RECRCM_ ACTIO_TYPE_C	Character (5)	None
Interval	MI_RECRCM_INTER_ N	Numeric	None
Interval Units	MI_RECRCM_INTER_ UNITS_C	Character (50)	None
Nonrecurring	MI_RECRCM_ NONRE_L	Boolean	Defaults to False when no value.
Performance Interval	MI_RECRCM_ PERFO_INTER_N	Numeric	None
Performance Interval Units	MI_RECRCM_ PERFO_INTER_ UNITS_C	Character (50)	None
Estimated Cost	MI_RECRCM_ ESTIM_COST_N	Numeric	None
Estimated Cost Basis	MI_RECRCM_COST_ BASIS_C	Character (255)	None
Recommended Resource	MI_RECRCM_ RECOMM_RSRC_C	Character	Must match a resource configured in the system picklist for this field.
(ENVIRONMENT) Consequence	ENVIRONMENT|MI_ CONSE_N	Numeric	None
(ENVIRONMENT) Probability	ENVIRONMENT|MI_ PROB_N	Numeric	None
(FINANCIAL) Consequence	FINANCIAL|MI_ CONSE_N	Numeric	None
(FINANCIAL) Maintenance Cost	FINANCIAL|MI_ RISK_MAIN_COST_N	Numeric	None

Source Field Name	Field ID	Data Type (Length)	Comments
(FINANCIAL) Probability	FINANCIAL|MI_PROB_N	Numeric	None
(FINANCIAL) Production Loss	FINANCIAL|MI_RISK_PROD_LOSS_N	Numeric	None
(OPERATIONS) Consequence	OPERATIONS|MI_CONSE_N	Numeric	None
(OPERATIONS) Probability	OPERATIONS|MI_PROB_N	Numeric	None
(SAFETY) Consequence	SAFETY|MI_CONSE_N	Numeric	None
(SAFETY) Probability	SAFETY|MI_PROB_N	Numeric	None
Basis for Assessment	MI_RCMFEFFT_BASIS_T	Text	None

Relationships:

Predecessor	Relationship	Successor
MI_RCMFEFFT	MIR_HRCMREC	MI_RECRCM

Reference Information: Data Loaders

This topic provides a listing of all detailed reference information provided for the APM Connect Data Loaders, such as command syntax, specifications, and table/field descriptions.

System Code Tables Used by Data Loaders

The following table lists the System Code Tables that are used by the APM Connect Data Loaders.

Table ID	Table Description	Function
MI_WORK_ PROCESS_ ADAPTERS	Data Loader Jobs	Contains a list of all of the loaders and is used to link the corresponding Job Label in the APM Connect Meridium Administration Center.
MI_INTERFACE_ LOG_CATEGORIES	Interface log categories	Contains a list of the log categories for APM Connect, and is used to categorize the log files by APM Connect component.

