Universal Client Help

Version 8.0.

Contents

Chapter 1

Introduction

Topics:

Overview

The Plant Applications Universal Client acts as a container of the applications for managing work orders as described in the following table.

Application	Description
Operations	Displays a list of operations associated with a work order. You can track the progress of completion of an operation, access reference documents, provide data for quality variables, specify consumption of BOM items, and create a defect.
NCR Management	Displays a list of nonconformities raised as defects on serial numbers or material lots. The application includes details for each defect and enables you to select a disposition plan for each defect or access a record of the disposition plan taken on each defect.
Order Management	Displays the status, progress, and priority of work orders. You can also access the work order, history, defects, and manage the planned dates of a work order, if required.
Route Management	Displays the routes used to manufacture a product. You can create routes, add operations to the route, assign BOM items, equipment, documents, and properties to the operations, and release a route for use in a work order.
Work Queue	Displays a list of operations that are ready or in progress. You can add operations to the work queue, track the progress of completion of an operation, access reference documents, provide data for quality variables, specify consumption of BOM items, and create a defect.
Property Definition	Displays a list of property definitions tailored to the requirements of your business. The application also displays the property groups and properties to which a property definition belongs.
Security Management	Displays a list of privilege sets available for each application in the Plant Application Universal Client. The application displays the groups added to each privilege set.
Downtime Displays	Displays the list of KPIs and downtime events for the machines assigned to the operator.
Equipment	Displays an overview of the OEE, Quality, Performance, and Availability KPIs. Additional information about each KPI is displayed as Pareto and Waterfall charts.
Reports	Displays KPI reports and production status of the plant by department, line, and unit. It also provides information about Planned vs. Actuals for each KPI.
My Machines	Enables an operator to subscribe and monitor the required machines for downtime events.
Analysis	Plots historical and live charts to visualize time series data available in Plant Applications and Historian. Displays information for production batches in the form of a Gantt chart.
OEE Aggregation Store	Calculates and stores OEE data in a database so that it is quickly accessible. The OEE data can be calculated at the site level. The OEE data can be refreshed at a configured interval.

Application	Description
Activities	Displays the activities planned within the duration of a shift. You can add an activity for an event within the shift duration, and then any user can perform the activity within the shift duration.
Alarms	Triggers alarm notifications based on rules configured in Plant Applications Administrator.

Recommended Browser and Minimum Resolution

Recommended Browser:

- Google Chrome 50 or later
- Safari

Recommended Minimum Resolution:

- For Order Management: 1360 x 768
- For Analysis: 1280 x 768
- For all the other applications: 1024 x 768

User Roles

The following table describes the user roles for each application in the Plant Applications Universal Client.

Application	User Roles Description
Operations	Enables operators to clock on the operations, perform the operations, specify the consumption of BOM items, provide data for quality variables, and mark the operations complete. Operators can also create a defect if a part is defective, which appears in NCR Management. **Note:** While the Operations module provides a list of serial numbers on which you can perform an operation using a selected piece of equipment, the Work Queue module provides a list of operations that are available for you to work on (regardless of the piece of equipment required to perform the operation).
NCR Management	Enables quality engineers to access the record of non-conformities raised as defects on serial numbers or material lots and decide the disposition plan for a defect.
Order Management	Enables supervisors to monitor the status and progress of work orders and manage the priority of a work order if required.
Route Management	Enables supervisors to create routes and define the product line, material, BOM formulation, operations, BOM items, equipment, documents, and properties used in each route.

Application	User Roles Description
Work Queue	Enables operators to view a list of operations in their work queue, add additional operations, clock on the operations, perform the operations, specify the consumption of BOM items, provide data for quality variables, and mark the operations complete. Operators can also create a defect if a part is defective, which appears in NCR Management. **Note:** While the Operations module provides a list of serial numbers on which you can perform an operation using a selected piece of equipment, the Work Queue module provides a list of operations that are available for you to work on (regardless of the piece of equipment required to perform the operation).
Property Definition	Enables supervisors to create the property definitions, and then link these properties to a specific property group and property category.
Security Management	Enables Administrators to add groups to a privilege set, provide access to a privilege set for users to access the application, and remove access to a privilege ses.
Downtime Displays	Enables operators to add, modify, copy, delete, split, and merge downtime events for the selected machines.
Equipment and Reports	Enables supervisors, process engineers, maintenance engineers, and operation leaders to enhance the capability of Plant Applications data to monitor quality, performance, availability, and overall equipment effectiveness of plant equipment.
My Machines	Enables operators to select the required machines, from the assigned machines, for which they want to view the downtime events.
Analysis	Enables operators, supervisors, and process engineers to analyze time series data and live issues, and to quickly troubleshoot issues and make improvements. Process engineers can also analyze the production batches and golden batches information.
Activities	Enables operators and supervisors to perform, complete, release, and skip an activity associated with an event.
Alarms	Enables supervisors to receive alarm notifications based on rules configured in Plant Applications Administrator.

Access the Plant Applications Universal Client

Procedure

1. In a web browser, enter the URL in the following format: `https://<hostname>:<port>`; where *<hostname>* is the host name or IP address of the server on which you installed the Plant Applications Universal Client, and *<port>* is the port number you used to install the server.
   The **Welcome** page appears.
2. Enter your user name and password, and then select **Sign in**.

Results

The applications available within the Plant Applications Universal Client appear.

Chapter 2

Operations

Topics:

About the Operations Application

Overview

As an operator, you can use the Operations application in the Plant Applications Universal Client to access the operations associated with a work order. Each row in the **Operations** page represents an operation to be performed or has been completed. By default, the Operations application contains the operations of the **Machine** that you select.

You can perform the following tasks in the Operations application:

- Access an operation
- Clock on an operation
- Clock off an operation
- Specify a quality variable
- Access an instruction document associated with the operation
- Access a list of BOM parts associated with a lot
- Consume a lot during production
- Create a lot
- Create a defect

About Work Orders and Operations

A work order is a request to manufacture a certain quantity of products in a given time. The work orders are grouped by product and are assigned to a specific Production Line for manufacturing.

Note: To execute a work order on a Production Unit and manufacture products on a Production Line, you must enable the Production Line to use routes in the Plant Applications Administrator. For more information, refer to the Proficy Plant Applications Help.

A work order comprises the job details and operations. An operation in a work order is an executable job performed on a Production Unit of a Production Line. When all the operations are completed, the status of the work order changes to Completed in the Order Management application.

Note: If BOM parts are configured for an operation and marked as mandatory, the operation is marked complete only if the BOM parts are consumed. Similarly, if quality variables are configured for an operation, the operation is marked complete only if values for the quality variables are provided.

The operations that appear in the Operations application are either created in Route Management or imported to the Plant Applications database by using the Plant Applications Enterprise Resource Planning (ERP) scheduler and import services.

Tip: For information on the import process, refer to the Plant Applications ERP Integration Guide.

Operation Status Indicators

The following table describes the color-coded status indicators of a serial number with respect to an operation that appears in the Operations application.

Status Indicator	Description
	Indicates that the serial number in the operation is in the Ready status. This status indicator appears when an operation is ready to be performed on the serial number.

Status Indicator	Description
	Indicates that the operation is in the On Hold status. This status indicator appears when a defect has been created for a serial number in the operation. After the defect is closed, the status of the operation is modified to the In Progress status and the operation appears in the **Open** page.
	Indicates that the operation is in the Complete status. This status indicator appears when an operation, the quality variables associated with the operation, and the mandatory BOM items associated with the operation are completed for all the serial numbers in the operation. **Note:** Defining quality variables and BOM items for an operation are optional. However, if they are defined, they must be completed for all the serial numbers in the operation for the operation to be marked complete.
	Indicates that another user has clocked off the serial numbers in the operation.
	Indicates that the serial numbers in the operation are currently clocked on by multiple other users, and none of the serial numbers in the operation is currently clocked on by you.
	Indicates that the serial numbers in the operation are currently clocked on by you and multiple other operators.
	Indicates that the serial numbers in the operation are currently clocked on by you.
	Indicates that work has been started on the operation, but no one is currently clocked on to any of the serial numbers in the operation.

Accessing an Operation

Access an Operation

About This Task

As an operator, you can access the operations in the Ready, In Progress, on Hold, and Completed statuses associated with a machine in the Operations application.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of open operations in a table with an ascending sort applied in the PRIORITY and MODIFIED ON fields (the field values of the operations with highest priority and the latest modified date appear first in the table). The number of operations that appear in a page depends on the resolution of your computer screen.

   Tip: Select  to manually refresh the list of operations in the **Open** page. You can resize the field (column heading) by using a drag-and-drop operation in the heading row.
3. Refer to each non-modifiable field that appears in the respective application page as described in the following table.

Option	Description
STATUS	The status of the lot at the operation. For more information, refer to the Operation Status Indicators on page 6 topic.
SERIAL/LOT	The lot number or serial number associated with the work order.
WORK ORDER	The unique identifier of a work order associated with an operation.
PRI	The order in which the work order must be completed on a machine.
MATERIAL	The material number associated with the operation.
OPERATION	The name of the operation.
MODIFIED ON	The date and time when the operation was last modified. The date and time appear in the format mm/dd hh:mm (for example, 03/27 10:58).
USER(S)	The name of the user who has currently clocked on the serial numbers in the operation. If multiple users have clocked on currently, the number of users appears in the USER(S) field for that operation. Select *<number_of_users>* to access the list of names of the users who worked on an operation.
ON/OFF	Indicates whether you have currently clocked on or clocked off the serial numbers in the operation.

Note: Select  to show or hide the fields in the table using a drag-and-drop operation.

4. Select  for a field to filter the operations.
5. **Optional:** Select an operation to access the BOM parts, instruction documents and quality variables associated with the operation.

Results

The operations appear in the respective application page.

Search for an Operation

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears.
3. In the main navigation bar, select  .
   A window containing a list of search options appears.
4. Specify the appropriate search options as described in the following table.

Option	Description
SERIAL/LOT	Enter a serial number or lot number to access the associated operations. **Tip:** To search for an operation using a barcode, select  , and then scan for the barcode of the serial number or lot number associated with the operation. The Operations application supports the barcodes of standards Code 39 and Code 128 only.
WORK ORDER	Enter a work order number to access the associated operations. **Tip:** To search for an operation using a barcode, select  , and then scan for the barcode of the work order associated with the operation. The Operations application supports the barcodes of standards Code 39 and Code 128 only.

Option	Description
MATERIAL	Select the drop-down list box, and then search for a material to access the associated operations.
EQUIPMENT	Select the drop-down list box, and then search for an equipment to access the associated operations.
STATUS	Select the drop-down list box, and then select an operation status to access the associated operations.
Clocked On	Select to access the operations that you have currently clocked on.

5. Select  for a field to filter the operations.

Results

The operations based on the specified search criteria appear.

Tip: To clear the results and perform new search, select **Clear Results** in the respective application page.

Clocking on an Operation

About Clocking on an Operation

The operations are planned for execution in one or more Production Units during production; you can, however, clock on an operation only in one Production Unit.

A clock-on process on an operation locks the operation for a Production Unit. As an operator, you can clock on an operation in the Ready status to indicate that you are ready to accept the work and perform the operation. Multiple users can clock on the same operation in a Production Unit. After you clock on an operation, the following actions take place:

- The selected operation is no longer available in the other Production Units.
- A timer is enabled to monitor the time you spent on the completion of an operation. The time you spent on an operation is visible only to you. The completion time of an operation might differ from one operator to the next.
- A clock-on status indicator appears for the operation. For more information, refer to the Operation Status Indicators on page 6 topic.

Clock on an Operation

Before You begin

Ensure that the operation is in the Ready or In Progress status to clock on.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears.
3. Select an operation in the Ready status, and then select the **ON** button to enable the clock-on process on an operation.

   Tip: You can use the **USER(S)** column in the **Open** page to access the IDs of the users who have currently clocked on the operation.

Results

The selected operation is clocked on and the status of the operation is modified to In Progress. A timer appears in the operation details section to track the time taken to complete an operation.

Clocking off an Operation

About Clocking off an Operation

As an operator, you can clock off an operation if you want to stop working on a serial number intermittently. The timer in the page displaying operation details stops tracking the time when you clock off an operation and starts tracking back only when you clock on the operation again. Thus, the time taken to complete the operation excludes the clocked off time, resulting in a more accurate calculation.

Note: When you complete an operation, the operation is clocked off automatically.

Clock off an Operation

Before You begin

You can only clock off an operation in the clocked on state.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations for the selected machine.
3. Select a clocked-on operation, and then select the **OFF** button to enable the clock-off process on an operation.

Results

The operation is clocked off.

Consuming a Lot

About BOM Parts

The bill of materials (BOM) is a list of formulation items required to manufacture a product. The **BOM** section in the Operations application enables you to access a list of BOM parts or items associated with an operation within a Production Unit and consume them during production. In the Operations application, a BOM item is represented by the BOM part number.

To consume a lot during production, you must perform the following steps:

1. Access a BOM part from the existing list of BOM parts to view the consumption history. You can use the consumption history of a BOM part within an operation to compare the required quantity with the consumed quantity of the BOM part.
2. Consume a lot during production.
3. Create a lot, in case, the BOM part does not exist.

The color of a row in the table indicates the requirement type and the consumption status of a BOM part as described in the following table.

Color	Description
Pink	Indicates that the BOM part is mandatory to complete an operation. When you select a mandatory BOM part, the page containing the part details and consumption history displays the **MANDATORY** label. To complete an operation, you must consume all the mandatory BOM parts in the operation. **Note:** The **BOM** tab in the Operations application displays the quantity of mandatory BOM parts required to complete an operation when the following conditions are true: • The required BOM parts are not consumed for an operation. • The quantity of BOM parts consumed is lesser than the required quantity of the BOM parts.
White	Indicates that the BOM part is not mandatory to complete an operation. **Note:** These BOM parts are supplementary for an operation.
Blue	Indicates that consuming the BOM part is mandatory and the BOM part is consumed while executing an operation during production. **Note:** The BOM part row turns blue when the consumed quantity of the BOM part is greater than or equal to the required quantity of the BOM parts for that operation.

Access a BOM Part

About This Task

An operation contains a list of parts necessary to execute an operation. As an operator, you can access the **BOM** section in the Operations application to consume the BOM parts in a Production Unit.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations associated with the selected machine.
3. In the **Open** page, select an operation, and then select the **BOM** tab.
   The **BOM** section appears, displaying the BOM parts associated with the selected operation.
4. Refer to each field for a BOM part that appears in the **BOM** section as described in the following table.

Field	Description
ORDER	The recommended order of consumption of the BOM part in an operation.
PART#	The BOM part number associated with the consumable material lots.
DESCRIPTION	The description of the BOM part.
REQ QTY	The planned quantity of the BOM parts required for the completion of an operation.
CONSUMED QTY	The actual quantity of the BOM parts consumed during the production.
UOM	The unit of measure (UOM) of the BOM part.

5. In the **BOM** section, select a part.
   The page containing the part details and consumption history appears.

Results

The BOM parts for the selected operation appear in the Operations application.

Consume a Lot

About This Task

Consuming a lot represents the process of utilizing a BOM part within an operation. As an operator, you can access the **BOM** section in the Operations application to consume the lots while executing an operation.

Before You begin

You must clock on an operation to consume a lot.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations associated with the selected machine.
3. In the **Open** page, select an operation, and then select the **BOM** tab.
   The **BOM** section appears, displaying the BOM parts associated with the selected operation.
4. In the **BOM** section, select a BOM part.
   The page containing the selected BOM part details appears.

   Tip: You can access the consumption history of the BOM parts in the **Consumed History** section.
5. In the **SERIAL/LOT#** box, enter the serial number or lot number of the BOM part that you want to consume in the operation. Alternatively, to search for a lot by using a barcode, select  , and then scan for the barcode of the lot associated with the BOM part. The Operations application supports the barcodes of standards Code 39 and Code 128 only.

   Note: The **SERIAL/LOT#** box and the  button are available only when the operation associated with the BOM part is clocked on. Else, you can access only the Consumed History for that BOM part. The search result of the **SERIAL/LOT#** box is not case-sensitive.

   The Available: *<quantity_of_parts>* message displays the quantity of BOM parts available in the lot for consumption. If the required quantity of the BOM parts specified in the **REQUIRED QTY** box is less than or equal to the quantity available in the lot, the Available: *<quantity_of_parts>* message appears in grey, else the message appears in red. In the **REQUIRED QTY** box, if you enter a lot number of a lot that is unavailable in the Plant Applications database or enter a value more than the available quantity in the lot, an informational message appears in red as described in the following table.

Informational Message Name	Message Condition	Corrective Actions
Available: *<quantity_of_parts>*	The available quantity in the lot is lesser than the required quantity specified in the **REQUIRED QTY** box.	Do one of the following tasks: • Consume the available quantity of the BOM part from the existing lot, and then consume the remaining quantity from another lot. • Search for another lot that contains the total required quantity of the BOM part, and then consume the BOM part.

Informational Message Name	Message Condition	Corrective Actions
Serial/Lot Not Found	The lot number or serial number is invalid.	Ensure that the lot is available in the database. You can create a lot on a machine and then consume the BOM parts from the lot. For more information, refer to the Create a Lot on page 14 topic.
This serial/lot is currently not available. Production status = consumed,Current quantity = <*value*>.	The lot is not available in the database for consumption.	Search for another lot that contains BOM parts, and then consume the BOM part.
Lot identifier is found but not available for consumption	The selected lot does not contain BOM parts to consume.	Search for another lot that contains BOM parts, and then consume the BOM part.
Serial/lot does not match the material being consumed	The BOM part material differs from the material in the lot being consumed.	Ensure that the material in the BOM part and lot is identical.
Duplicate record found. Unable to consume.	More than one record or duplicate records are available for the same lot in the Production Unit. You cannot consume a BOM part from a lot with duplicate records in an operation.	Ensure that there are no duplicate records in the selected lot.
Unit of measure of the serial/lot does not match unit of measure for required quantity.	The unit of measure (UOM) of the BOM part and the lot is different.	Ensure that the UOM of the BOM part and the lot is same.

Note: An error message appears when the Operations application is unable to retrieve the lots for consumption from the Plant Applications database.

6. In the **QTY TO CONSUME** box, enter the quantity of the BOM parts you want to consume in the operation.

   Note: The quantity must be a positive integer. If you enter a value less than or equal to zero in the **QTY TO CONSUME** box, an informational message appears indicating that you must enter a value greater than zero.

7. Select **Consume**.

   Note: If you select **Consume** without entering the quantity of the BOM parts you want to consume in the **QTY TO CONSUME** box, an error message appears in red indicating that you must enter a valid serial or lot number in the **SERIAL/LOT#** box.

   An entry for the consumption of the material is added to the table in the **Consumed History** section. In case you consume more than one lot for an operation, the number of entries in the **Consumed History** section depends on the number of lots that are consumed. After an entry is created in the **Consumed History** section, you cannot cancel the consumption of the BOM part. If there are any issues in the **Consumed History** section, contact your Administrator through the Plant Applications Administrator Client.

8. **Optional:** Select the *PART#* links in the page displaying BOM part details to navigate to the previous and next BOM parts in a sequential order of the BOM parts.
9. **Optional:** In the **JUMP TO PART NUMBER** box, specify the part number that you want to locate and then press the Enter key on the keyboard. You must enter the complete part number in the search box and the Operations application displays only the BOM part that contains the search text. Alternatively, to search for a BOM part by using a barcode, select  , and then scan for the barcode of the BOM part. The Operations application supports the barcodes of standards Code 39 and Code 128 only. The page containing the selected BOM part details appears.

Results

The BOM parts are consumed in the selected operation, and the quantity of the material consumed appears in the CONSUMED QTY field in the **BOM** section in the Operations application.

Create a Lot

About This Task

As an operator, you can create a lot in the BOM section if the lot is not available for consumption while executing an operation.

Before You begin

- You must clock on an operation to consume or create a lot.
- If the operation is not clocked on, the **SERIAL/LOT#** box is not enabled.

Procedure

1. At any point while you are consuming a lot, enter the lot number of the BOM part you want to consume in the **SERIAL/LOT#** box.
2. In the **QTY TO CONSUME** box, enter the quantity of the BOM parts you want to consume in the operation.
3. Select **Consume**.
   A message appears indicating that the lot number you entered is not available in the Plant Applications database and if you want to create a lot.
4. In the **EQUIPMENT** drop-down list box, select an equipment on which you want to create the lot.

   Note: A list of equipment or units appear based on your product and equipment configuration and the unit of measure (UOM) of the BOM part and the equipment. Based on these conditions, you can do one of the following:

   - Select one of the equipment, if more than one equipment is available in the Plant Applications database.
   - By default, an equipment appears in the **EQUIPMENT** drop-down list box, if there is only one equipment available in the Plant Applications database.
   - Create a lot on your current equipment if there is no equipment available in the Plant Applications database that matches with these conditions. However, you can create a lot on your current equipment only when the UOMs of your equipment and BOM part matches.

   Else, an error message appears indicating that the unit of measure (UOM) of the equipment does not match with the UOM of the BOM part. To resolve this error, you can configure the product and equipment in the Plant Applications **Admin** page.
5. In the **QTY TO CREATE** box, enter the quantity of the BOM parts that you want to create on the lot.
6. Select **Yes**.

Results

A lot is created in the Plant Applications database and the quantity of BOM parts specified are consumed from the lot created.

Completing an Operation

About Completing an Operation

An operation is completed when all the activities or jobs associated with the operation are completed. As an operator, you can complete an operation only when one or more of the following conditions are true:

1. The operation is clocked on and is in the In Progress status. You can also clock on an operation from the **Search** window.
2. The BOM parts required to complete the operation are consumed. Only if all the mandatory BOM items have been consumed for all the serial numbers, you can mark the operation complete.
3. All the quality variables associated with the operation are specified.
4. If needed, you can create a defect for the serial number.
5. Mark the operation as complete.

Note: When an operation is clocked on by multiple operators and an operator completes the operation, the operation is marked as Complete for all the operators.

After all the operations in a work order are completed, the work order is marked complete in the Plant Applications Universal Client. You can view the completion status of the work order in Order Management.

Access the Documents

About This Task

The Operations application enables you to access the documents associated with a work order as a PDF file. These documents are defined while creating the work order or route. The documents can be instruction manuals and technical publications associated with the operation. As an operator, you can use the **Documents** section in the Operations application to access the documents.

The documents available in the Plant Applications Universal Client are imported using the Plant Applications Enterprise Resource Planning (ERP) scheduler or from the Route Management application.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations associated with the selected machine.
3. In the **Open** page, select an operation.
   The **Documents** section appears, displaying the documents associated with the operation.
4. Select a document in the **General** section to access the instruction documents defined at the route level for that operation.

Results

The instruction documents associated with the operation appears in the **Documents** section.

Specify a Quality Variable

Before You begin

Clock on an operation for which you want to provide data for quality variables.

About This Task

The **Quality Data** section in the Operations application displays the quality variables that are defined in the Plant Applications Administrator. To complete an operation, the operation associated with a machine must meet the quality variable specifications.

For example, suppose you have been assigned the testing operation in a manufacturing unit. Quality variables can include the pressure and temperature of the product. When you test each product, you must enter the pressure and temperature values for the corresponding serial number. A quality supervisor can then verify that the pressure and temperature fall within the acceptable range.

You can provide data for quality variables only for serial numbers that you have clocked on.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations for the selected machine.
3. In the respective application page, select an operation in progress.
   The **Documents** section appears, displaying the documents associated with the operation. You can refer to the documents that appear in the **Documents** section for instructions or any other reference material.
4. Select **Quality**.
   The **Quality** page appears, displaying the variables defined for the selected operation.

   Tip:

   - By default, only the mandatory quality variables appear. If you want to access all the quality variables, switch the **Dynamic Rows** toggle.
   - If you want to view the lowest, highest, lower quartile, upper quartile, and median values for each variable, select  . If you want to view the same values plotted on a chart, select  .
   - If you want to add a comment, select  .
5. For each variable, enter data in the **SPEC** column.

   Tip: If you want to plot the value on a chart, select  .

   If acceptable limits have been specified for the variable, the box in the **SPEC** column displays a color, indicating whether the value that you have entered is within the acceptable range.
6. Repeat steps 3 and 4 for each serial number in the operation.

Results

The data for the quality variables is saved.

Next Steps

If a part contains a defect, create a defect. Otherwise, complete the operation.

Complete an Operation

About This Task

After you completed working on an operation, you must mark the operation as complete for the corresponding serial number.

An operation is completed when all the activities or jobs associated with the operation are completed. After all the operations for a work order are marked complete, the work order is marked complete in the Plant Applications. You can view the completion status of the work order in the Order Management application.

Before You begin

1. Consume all the required BOM parts for all the serial numbers that you want to mark complete.
2. Specify the Quality Variables for all the serial numbers that you want to mark complete.

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations for the selected machine.
3. In the respective application page, select an operation.
   The **Documents** section appears, displaying the documents associated with the operation. You can refer to the documents that appear in the **Documents** section for instructions or any other reference material.
4. Select the  button for the operation you want to complete.

Results

The operation associated with the work order is completed, and the completed operation appears in the **Complete** page.

Creating a Defect

About Creating a Defect

As an operator, you can use the Operations application in the Plant Applications Universal Client to create a defect on an operation when materials associated with a Production Unit do not meet the specification or requirement of a process, system, internal policies and procedures, customer requirements, and regulatory body.

Note: You can only create a defect for a clocked on operation available in the In Progress status.

After you create a defect on an operation, the status of the serial number and operation is modified to On Hold and appears in the **On Hold** page.

For more information on defects and depositioning of the defects, refer to the NCR Management section in the Plant Applications Universal Client Help.

Create a Defect

Procedure

1. Select **Operations**.
2. In the **Machines** drop-down list box, select a machine.
   The **Open** page appears, displaying a list of operations for the selected machine.
3. In the **Open** page, select a clocked-on operation.
   The **Documents** section appears, displaying the documents associated with the operation.

4. Select the **NCR** tab.
   The **NCR** page appears, displaying a list of defects associated with the selected operation.
5. Select **Create Non Conformance**.
   The **Create Non Conformance** window appears.
6. In the **Create Non Conformance** window, specify the options as described in the following table.

Option	Description
SUMMARY	Enter a summary for the defect. A value is required in this field.
NON-CONFORMANCE TYPE	Refer to the non-conformance type of the defect as Manufacture Defect. This field is read-only.
DEFECT TYPE	Select the type of defect associated with the serial number.
DEFECT REASON	Select the reason for creating the defect in the material associated with the operation. Use the reason tree to specify the reason for the defect, and then select **Apply**. **Note:** You must configure the defect reason tree in the Plant Applications Administrator, and then link that defect reason tree for selection in the Operations application by using a script file.
FULL DESCRIPTION	Enter a detailed description of the defect in the BOM part associated with an operation.

7. Select **Submit**.
   A defect is created on the operation, and the operation is put on hold. The operation on hold appears in the **On Hold** page in the Operations application.

Results

The defect appears in the NCR Management application. For more information about disposing a defect, refer to the Dispose of a Single Defect on page 24 topic.

Chapter 3

NCR Management

Topics:

About the NCR Management Application

A non-conformance occurs when a serial number or material lot does not meet the specification or requirement of a process, system, internal policies and procedures, customer requirements, and regulatory body. The NCR Management application in the Plant Applications Universal Client enables you to:

- Search and build a queue of user selected non-conformances.
- Select a disposition action to define a detailed disposition plan.
- Keep record of non-conformities and the corrective actions taken to address them.

The non-conforming parts are in the form of a defect created in the Operations and Work Queue applications in the Plant Applications Universal Client.

The NCR Management application tracks parts based on a serial number included in the defect. After an operator creates a defect on an operation for a Production Unit, the associated serial number and operation are placed on hold in the Operations or Work Queue application, and the operators working on that associated serial number are clocked off, by default.

Note: This behavior can be changed to keep the user clocked on.

You can then access the defect details in the NCR Management application, and then select an appropriate disposition for the defect.

Disposition of Defects

A disposition is an action taken to resolve a non-conformance. The disposition method you select for a defect in the NCR Management application determines the disposition plan for the defect.

A disposition plan includes the disposition, a description of the corrective actions to be taken (by using an action tree), and any additional instructions to be followed to address the non-conformity. You configure the disposition action reason tree in the Plant Applications Administrator, and then you run a script file to link the disposition action reason tree for selection in the NCR Management application.

The disposition method that you select in the NCR Management application is described in the following table.

Disposition	Effect
Use As Is	The non-conforming part is acceptable for being used as is.
Continue to process (CTP)	The non-conforming part can undergo operations up to the specified CTP operation, at which point a defect can be addressed.
Clear	The non-conforming part does not require any corrective action and is not considered defective.
Scrap	The non-conforming part cannot be used and should be scrapped.
Rework	The non-conforming part can be used after performing rework on the specified operation.

For more information, refer to the Dispose of a Single Defect on page 24 topic.

Access Defects

About This Task

As a Quality engineer, you can search for defects in the|Home page of the|NCR Management|application.

Note: As an operator, you can create defects in the|Operations|or Work Queue applications. For more information, refer to the Create a Defect on page 17|topic. As a Quality engineer, you can perform disposition on defects that are in Submitted status. For more information, refer to Dispose of a Single Defect on page 24 topic.

Procedure

1. Log in to the |Plant Applications Universal Client.
2. Select|**NCR Management**.
   The|Home|page appears.
3. Enter any of the following in the search bar to search for the associated defects:
   - Serial/Lot number
   - Non Conformance number (NC)
   - Work Order number (WO)
   - Plan number

   The entry is added to the Queue.
4. Select the appropriate item from the Queue.
   The defects for that selected Serial number, NC, WO, or Plan are displayed in a table with the descending sort order applied to the MODIFIED ON field (the field values of the last modified defect appear first in the table). The number of defects that appear in a page depends on the resolution of your screen.

   Note: The create plan functionality is enabled only in the Non-Conformance (NC) view, that is, when you search for defects using the Non Conformance number.
5. Refer to each read-only field for a defect as described in the following table.

Field	Description
STATUS	The status of the defect. Following are the different statuses of a defect: • **Submitted:** The defect is Submitted for disposition. Indicated by  . • **Active:** The disposition plan for the defect is active. Indicated by  . • **Not a Defect:** The defect is considered invalid. Indicated by  . • **Closed:** The disposition plan for the defect is completed. Indicated by  .
SERIAL/LOT#	The material lot number or serial number that was put on hold.
OPERATION	The operation for which the defect was created.

Field	Description
SUMMARY	The summary entered when the defect was created in the Operations or Work Queue application.
DEFECT TYPE	The defect type selected when the defect was created in the Operations or Work Queue application.
DISP STATUS	The disposition action status. Following are the disposition action statuses: • **Submitted**: The disposition method has been submitted. • **Active**: The disposition method is in progress. • **Completed**: The disposition method is completed.
DISP	The type of disposition method selected.
CTP/REWORK	CTP: Specifies a higher sequence operation. Work can be performed until it reaches the CTP operation. REWORK: Specifies an operation that must be completed prior to completing the disposition.
PLAN MODIFIED BY	The name of the user who last modified the plan.

Field	Description
PLAN MODIFIED ON	The time stamp when the plan was last modified, in the format mm/dd hh:mm (for example, 11/14 15:01).
ACTIONS	The actions you can perform on a serial/material lot number. Includes the following: • **Add serial number to queue**: Select the icon  to add a serial number to the queue. When you select the serial number from queue, you can view all the defects created for that serial number. • **Disposition**: Select the icon  to choose the disposition plan. • **Menu**: Select the icon  . Includes the following options: ◦  **View**: Select this option to view details of the defect. ◦  **Edit**: Select this option to edit the non-conformance details added by the operator in Operations and Work Queue Applications. Enabled only when the defect is in the Submitted status or when the defect is in the Active status and the selected disposition method is Continue to Process. ◦  **History**: Select this option to view all the actions performed on the defect by the user. **Note:** In the History grid, click  to view **ADDITONAL INFORMATION** related to the defect. ◦  **Remove from Plan**: Select this option to remove the serial/ material lot number from the associated plan. Enabled only when the defect is in submitted status. **Note:** When you remove the serial/material lot number from a plan, the disposition button is not enabled. You can dispose of the associated defect only by creating another plan for the serial/material lot number.

6. Select a field (that is, column heading) to sort the field values in the ascending order (A to Z [case-sensitive] for letters, smallest to largest for numeric data, and oldest to newest for dates) or descending order (Z to A [case-sensitive] for letters, largest to smallest for numeric data, and newest to oldest for dates).
7. Filter a Defect on page 29
8. Select  to dispose of a defect that is in Submitted status. Alternatively, you can dispose of multiple defects at a time. For more information, refer to Dispose of Multiple Defects on page 25 .

Dispose of a Single Defect

About This Task

As a Quality engineer, you can define the disposition plan for defects in the Submitted status.

Before You begin

Ensure that you have configured the required disposition action reason tree in the Plant Applications Administrator, and then linked the disposition action reason tree for selection in the NCR Management application by using an appropriate script file.

Procedure

1. Access the defect that you want to dispose.

   Note: You can dispose of a defect only if it is in the Submitted status, which is indicated by  , in the Home page.

2. Select  for the defect that you want to dispose.
   The **Disposition** window appears.
3. In the **Select Disposition** drop-down list box, select an option as described in the following table.

Option	Description
Clear	Select**|Clear|**if the defect raised for the non-conforming part is not considered as a defect.
Continue to process (CTP)	Select **Continue to process** to allow work on the non-conforming part, and then select the operation until which you can continue the operations process, in the **Select Operation** drop-down list box.
Use As Is	Select **Use As Is** to use the non-conforming part in the operations as it is.
Scrap	Select **Scrap** to discard the non-conforming part.
Rework	Select **Rework** to rework on the non-conforming part, and then select the operation on which the part should be reworked, in the **Select Operation** drop-down list box.

4. Select **Select Disposition Action Reason**.
   The **Select reasons** window appears.
5. In the **Select reasons** window, select a corrective disposition action reason and the associated subreasons, as applicable.

   Tip: In the **Search** box, enter a disposition action reason to search for, and then select the reason from the reasons list.
6. **Optional:** In the **ADDITIONAL INFORMATION** box, enter any relevant information such as a URL, contact details of the supplier, or any information that is helpful to perform the root cause analysis of the non-conformance.
7. Select **Submit**.

Results

Following actions take place based on the selected disposition.

Disposition Type	Result
Clear	• The status of the defect is set to Not a Defect, indicated by  . • The hold on the serial or material lot number and the operation on which the defect was created is released. • The hold on all future operations associated with the serial or material lot number is released.
Continue to process (CTP)	• The status of the defect is Active, indicated by  . The status of the defect is automatically changed to Submitted when execution on the work order reaches the specified CTP operation. • When the defect is in Active state, the Hold moves to the specified CTP operation. The current serial number or lot will be released from Hold. • When the CTP operation is reached, the operation will be released from Hold but the serial number or lot being worked on will again be placed on hold. The defect status is now back in Submitted state.
Use As Is	• The status of the defect is set to Closed, indicated by  . • The hold on the serial or material lot number and the operation on which the defect was created is released. • The hold on all operations associated with the serial or material lot number is released.
Scrap	• The status of the defect is set to Closed, indicated by  . • The hold on the serial or material lot number and the operation on which the defect was created is released in the Operations or Work Queue application. • The hold on all operations associated with the serial or material lot number is released in the Operations or Work Queue application.
Rework	• The status of the defect is set to Active, indicated by  . After completion of the rework operation, the status is changed to Submitted, indicated by  . • Lot hold is created on the serial number and operation hold (on the operation on which the defect was raised) is released. • The hold on all other operations associated with the serial or material lot number is not yet released. The hold is released after completion of rework.

Dispose of Multiple Defects

About This Task

As a Quality engineer, you can dispose multiple defects at once by creating a plan.

Procedure

1. Create a Plan on page 26.

Note: A plan can only be created in NC view.

2. Enter the plan number in the search bar. The plan is added to the queue in the Home page.
3. Select the plan number from the queue. All the defects associated with the plan appear on the Home page
4. Select  .
   The **Disposition** page appears. The disposition page displays the number of defects being disposed.
5. In the**|Select Disposition|**drop-down list, select an option as described the following table.

Option	Description
Clear	Select**|Clear|**if the defects raised for the non-conforming parts are not considered as defects.
Continue to process (CTP)	Select**|Continue to process|**to allow work on the non-conforming parts and then select the operation till which you can continue the operations process, in the**|Select Operation|**drop-down list box.
Use As Is	Select**|Use As Is** to use the non-conforming parts in the operations as they are.
Scrap	Select**|Scrap|**to discard the non-conforming parts.
Rework	Select**|Rework|**to rework on the non-conforming parts and then select the operation on which the parts should be reworked, in the**|Select operation|**drop-down list box.

   The**|Select reasons|**window appears.
6. In the**|**Select reasons**|**window, select a corrective disposition action reason and the associated sub reasons, as applicable.

   Tip: In the**|Search|**box, enter a disposition action reason to search for, and then select the reason from the reasons list.
7. **Optional:|**In the**|ADDITIONAL INFORMATION|**box, enter any relevant information such as a URL, contact details of the supplier, or any information that is helpful to perform the root cause analysis of the non-conformance.
8. Select**|Submit**.

Results

The status of the defects is changed based on the selected disposition method. For more information, refer to Results section of Dispose of a Single Defect on page 24 topic.

Create a Plan

Procedure

1. Enter an NC number in the search bar. All the defects associated with the NC number appear on the Home Page.

   Note: In NC view, a check-box is enabled against each defect in the grid.
2. Select the defects for which you want to create a plan.
3. Select  . Create a Plan or add to an existing Plan window appears.
4. Select **Add to a New Plan** radio button to add the defect to a new plan.
5. Select any of the listed plans in the window to add the defect to an existing plan.

   Tip: You can search for an existing plan using the Search box.

6. Select **Apply**.
7. **Optional**: Repeat step 1 to step 6 with other NC numbers, to add defects from multiple NC numbers to a single plan.

Edit CTP Disposition Method

About This Task

As a Quality engineer, you can modify any or all of the CTP disposition details when it is in the Active state:

- The operation until which the lot can be processed.
- The disposition method can be changed from the Continue to Process to any of the other disposition methods such as, Clear, Scrap, Rework or Use as is.
- The disposition action reason.
- The additional information related to disposition.

Procedure

1. Enter the plan number associated with the defect that is in the Continue to process disposition method.

   Tip: When you dispose of multiple defects, the plan number is added or selected by you when you create a plan. When you dispose of a single defect, the plan number is generated when you submit the disposition method. The plan number is displayed in the **PLAN** column of the grid on the Home page.

2. Select  .

   Note: When CTP disposition method is selected for a Plan, all the defects in the Plan are moved to Active state. You can select  , to edit CTP disposition method. For more information, refer to Edit CTP Disposition Method section.

   If at least one of the Serial Numbers/Lots completes the CTP operation (the defect moves to Submitted state), you are not allowed to the edit CTP disposition method.

   The disposition button is disabled. Only when all the Serial Nos / Lots complete the CTP operation (the all defected are moved to Submitted state), the disposition button is re-enabled to dispose the Plan.

   The **Disposition** page appears.
3. Modify the Disposition details as follows.

   To change the operation until which the lot can be continued to process:

   a) Modify the operation in the **Select operation** drop-down list box.
   b) Select **Select Disposition Action Reason** to modify the disposition action reason.
      The **Select reasons** window appears.
   c) Modify the reasons in the **Select reasons** window.
   d) In the**|ADDITIONAL INFORMATION|**box, modify any relevant information such as URL, contact details of the supplier, or any information that is helpful to perform the root cause analysis of the non-conformance.
   e) Select**|Submit**.

   To modify the disposition method of the defect:

   a) Select any of the following options in the**|Select Disposition|**drop-down list box:

Option	Description
Clear	Select**|Clear|**if the defect raised for the non-conforming part is not considered as a defect.
Use As Is	Select**|Use As Is** to use the non-conforming part in the operations as it is.
Scrap	Select**|Scrap|**to discard the non-conforming part.
Rework	Select**|Rework|**to rework on the non-conforming part, and then select the operation on which the part should be reworked, in the**|Select operation|**drop-down list box.

b) Select **Select Dispostion Action Reason** to modify the disposition action reason.
The **Select reasons** window appears.
c) Modify the reasons in the **Select reasons** window.
d) In the**|ADDITIONAL INFORMATION|**box, modify any relevant information such as URL, contact details of the supplier, or any information that is helpful to perform the root cause analysis of the non-conformance.
e) Select**|Submit**.

To modify the dispostion action reason:

a) Select **Select Dispostion Action Reason** to modify the disposition action reason.
The **Select reasons** window appears.
b) Modify the reasons in the **Select reasons** window.
c) Select**|Submit**.

To modify the additional information related to disposition:

a) In the**|ADDITIONAL INFORMATION|**box, modify any relevant information such as URL, contact details of the supplier, or any information that is helpful to perform the root cause analysis of the non-conformance.
b) Select**|Submit**.

Results

Scenario	Result
When the operation for Continue to process method is changed	• The hold is released on the previously selected operation, and a hold is created on the operation selected in Step 3.
Disposition method changed to Clear	• The hold is released on the operation selected previously for CTP disposition. • The defect status is changed to Not a Defect. • Disposition status is changed to Completed.
Disposition method changed to Rework	• The hold is released on the operation selected previously for CTP disposition. Hold is created on the operation at which the lot is currently on. The lot goes to the rework operation. • The defect status is Active. It is changed to Submitted after rework operation is completed.

Scenario	Result
	• Disposition is Active till rework is completed. It is changed to Completed after rework operation is completed.
Disposition method changed to Use As Is	• The hold on the operation selected previously for CTP disposition is released. • The defect status is changed to Closed. • The disposition status is changed to Completed.
Disposition method changed to Scrap	• The part is scrapped. • The defect status is changed to Closed. • The disposition status is changed to Completed. • All other defects related to the lot are scrapped and the following comment appears in the table next to those defects: Forcefully closed by being scrapped on nonConformance : <NC number>

Filter a Defect

About This Task

You can filter a defect in the Home page of NCR Management application based on the filter criteria you select.

The NCR Management application pages use the filter indicators as described in the following table. These indicators appear in the columns in the table.

Indicator	Description
	Indicates that the filter is not applied to the column.
	Indicates that the filter is applied to the column.

Note: The filter that you apply to a column is restricted to only that page. If you access any other application in the Plant Applications Universal Client, your filter selection is not retained in the NCR Management application.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select NCR Management.
3. Select  for the field column on which you want to apply a filter.
   A window containing the following options appear:
   - A list box containing a list of first 20 values available for the selected field with a case-sensitive ascending sort (A to Z [case-sensitive] for letters, and then lowest to highest for numbers). Move the vertical scroll bar in the list box to fetch more available field values. The vertical scroll bar appears when you hover over the list box.

- A **Search** box where you can enter a search text to refine the field values list.
- A **Select All** check box to select all field values including the field records that have no data.
- A **(Blanks)** check box to filter field records that have no data.

  Note: This check box appears only for the SUMMARY field.

4. Select the check box corresponding to one or more field values on which you want to filter the defects.

   Tip: Alternatively, in the **Search** box, enter search text to refine the field values list that match the search criteria. As you enter characters in the **Search** box, the field values list is automatically filtered to display only values that contain the search text. The matched field values are case-sensitive. A message appears if no field value is available corresponding to the entered search text. To select all field values, select the **Select All** check box.
5. Select **Apply**.

   Tip: Select **Cancel** to delete your selections and go back to the earlier page.

Results

The defects based on the applied filter criteria appear in the selected page, and the applied filter indicator appears for the field. You can apply filters on multiple fields in a page to refine the filtered data.

Tip: To clear a filter applied on a field, select for the field on which you want to remove the filter. Then, in the window containing the list of field values, clear the selected check boxes, and then select **Apply**. You can also select to modify the applied filter on a field.

Chapter 4

Order Management

Topics:

About the Order Management Application

Overview

As a supervisor, you can use the Order Management application for managing the work orders in the Plant Applications Universal Client.

Using the Order Management application, you can:

- Access the work orders whose statuses are In Progress, Ready, On Hold, and Completed.
- Prioritize a work order on a Production Line.
- Access the work order status.
- Access the work order history.
- Access the clocked on and clocked off operations.
- Access the NCM defects.

Work Order Components

Each row in the Order Management page represents a work order and displays the work orders of the selected **Line**.

A work order contains the following components:

- Work Order
- Operation
- Lot or Serial Number

Accessing a Work Order

About Work Orders

A work order is a request to manufacture a certain quantity of products in a given time. The work orders are grouped by product and are assigned to a specific Production Line for manufacturing. Depending on the quantity of the product to be manufactured, serial numbers are created in the ERP system.

Each row in the Order Management application represents a work order and are either created in Route Management or imported to the Plant Applications database by using the Plant Applications Enterprise Resource Planning (ERP) scheduler and import services.

Note: For information on the import services, refer to the Plant Applications ERP Integration Guide.

You can use the Order Management application to perform the following tasks.

- Access a Work Order
- Search for a Work Order

The status of a work order indicates the progress of work for the serial number and the operation, respectively. The following table provides a list of status indicators defined for a work order.

Table 1: Work Order Status Indicators

Status	Status Indicator	Description
Ready		Indicate that the work order is ready to be executed.
In Progress		Indicates that the work on a lot associated with a work order is in progress. This status indicator appears when an operation associated with the work order is clocked on when executing the work order.
Completed		Indicates that all the operations associated with all the lots are completed. **Note:** If a lot is scrapped, it is not considered while marking an operation complete.

Access a Work Order

About This Task

As a supervisor, you can access work orders in the Ready, In Progress, On Hold, and Completed statuses associated with a Production Line.

Before You begin

- Using the **Line** drop-down list box, you can access work orders associated with multiple lines.
- If you select a single line, the name of the selected line appears in the **Line** drop-down list box and if you select more than one line, the quantity of the selected lines appears (for example, 2 selected).
- If you access any other application or log out from Plant Applications Universal Client, your line selections are retained.

Procedure

1. In the **Order Management** page, select a line in the **Line** drop-down list box.

   Tip: Enter a value in the **Search** box to search for a line by the line name. As you enter characters in the **Search** box, the field values list is automatically filtered to display only values that contain the search text.

   The **Released** page appears, displaying a list of work orders in the table in the In Progress status with an ascending sort applied in the ACT START field followed by those in the Ready status with an ascending sort applied by priority and then by the date in the PLAN START field (the field values of the oldest work orders appear first in the grid table). The number of work orders that appear in a page depends on the resolution of your computer screen.
2. Refer to each field in the respective application page as described in the following table.

Field	Description
STATUS	The status of the work order.
WORKORDER	The unique identifier of a work order associated with a Production Line.
SERIAL/LOT	The quantity of serial numbers created in a work order. **Note:** If the planned quantity of serial numbers in the COMP QTY field is greater than one, the SERIAL/LOT field displays the quantity of serial numbers associated with the work order. Select *number_of_serials* to access a list of serial numbers and the statuses of each serial number associated with a work order. For more information, refer to the About Lots on page 39 topic.
MATERIAL	The material number associated with the work order.
HOLDQTY	The quantity of parts that are on hold in a work order.
SCRAPQTY	The quantity of parts scrapped in a work order.
COMPQTY	The quantity of parts completed or produced to that of the total quantity of parts planned in a work order. The COMP QTY appear in the format *completed_quantity* of *planned_quantity* (For example, 2 of 5).

Field	Description
PRIORITY	The priority of a work order. You can also prioritize a work order on a Production Line as per your need. For more information, refer to the Prioritize a Work Order on page 37 topic.
PLANSTART	The date and time when the work order was planned to begin. The date and time appear in the format mm/dd hh:mm (for example, 03/27 10:58).
PLANEND	The date and time when the work order was planned to end. The date and time appear in the format mm/dd hh:mm.
ACTSTART	The actual start date and time of the work order. The date and time appear in the format mm/dd hh:mm.
ACTEND	The actual end date and time of the work order. The date and time appear in the format mm/dd hh:mm.

3. Select to show and hide the fields in the table using a drag-and-drop operation.
4. **Optional:** Select in the ACTIONS column in the table to cancel a work order. For more information, refer to the Cancel a Work Order on page 37 topic.

   Note: You cannot cancel a work order in the In Progress status.

5. **Optional:** Select for a field to filter the work orders.

Results

The work orders appear in the respective application page.

Next Steps

Access the Work Order Status

Search for a Work Order

Procedure

1. In the **Order Management** page, select in the main navigation bar.
   A window containing a list of search options appears.
2. Specify the appropriate search options as described in the following table.

Field	Description
SERIAL/LOT	Enter a serial number or lot number to access the associated work orders. You must enter complete serial number in the **SERIAL/LOT** box and the Order Management application displays only the work order that contains the search text. **Tip:** To search for a work order using a barcode, select , and then scan for the barcode of the serial number or lot number associated with the operation. The Order Management application supports the barcodes of standards Code 39 and Code 128 only.
WORK ORDER	Enter a work order number to access the details of the work order. You must enter the complete work order number in the **WORK ORDER** box and the Order Management application displays only the work order that contains the search text. **Tip:** To search for an work order using a barcode, select , and then scan for the barcode of the work order associated with the operation. The Order Management application supports the barcodes of standards Code 39 and Code 128 only.
PRODUCT	Select the drop-down list box, and then search for a product to access the associated work orders.
STATUS	Select the drop-down list box, and then select a work order status to access the associated work orders.

3. **Optional:** Select for a field to filter a work order.

Results

The work orders based on the specified search criteria appear.

Tip: To clear the results and perform new search, select **Clear Results** in the respective application page.

Prioritizing a Work Order

About Prioritizing a Work Order

Priority is the order in which the work order is executed. When you assign a priority to a work order, the work order with the highest priority is executed first on a Production Line where, 1 denotes the highest priority and 0 denotes the lowest priority.

- You can prioritize a work order in the Ready or the In Progress status on the Production Line.
- You cannot prioritize a work order in the Completed status.

Prioritize a Work Order

Procedure

1. In the **Order Management** page, select a line in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the **Released** page, select a work order that you want to prioritize.
3. In the **Priority** box, enter a value for the priority of the work order.

   Note: The quantity must be a positive integer, where 1 denotes the highest priority and 0 denotes the lowest priority. If you do not enter a value in the **PRIORITY** box for a work order, a message appears indicating that you must enter a value.

   Tip: You can also specify the priority by accessing the work order details and selecting  .
4. **Optional:** Select to manually refresh the work orders in the **Released** page after you prioritize a work order. This will sort the list again to display in the order of the updated priority.
   The **Released** page displays a list of work orders in the table in the In Progress status with an ascending sort applied in the ACT START field followed by those in the Ready status with an ascending sort applied by priority and then by the date in the PLAN START field (the field values of the oldest work orders appear first in the grid table).

Results

The selected work order is prioritized.

Cancelling a Work Order

About Cancelling a Work Order

You can cancel a work order when you no longer need it. When you cancel a work order, the work order is removed from the Order Management, Operations, and Work Queue applications. The following conditions apply when you remove operations from the Order Management application.

- You can cancel a work order only in the Ready status.
- You cannot cancel a work order in the In Progress or Completed status.

Cancel a Work Order

Procedure

1. In the **Order Management** page, select a line in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the **Released** page, select a work order in the Ready status that you want to cancel.
3. Select  .
   The **Warning** window appears.
4. Select **Yes** to cancel the work order.
   The selected work order is cancelled.

   Tip: Select **No** to go back to the **Released** page without cancelling the work order.

Results

The selected work order is cancelled and no longer available in the Order Management and Operations applications.

Modifying Planned Dates of a Work Order

About Planned Start and End Dates of a Work Order

A planned start and end date in a work order denotes the date and time when the work order is planned to begin and end, respectively. As a supervisor, you can modify the planned dates when you cannot start the work orders as per the schedule. It provides visibility to the supervisor on the progress of work for the work order.

Modify the Planned Start and End dates of a Work Order

Before You begin

You can modify the planned start and end dates of a work order only if it is in the In Progress or Ready state.

Procedure

1. In the **Order Management** page, select a line in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the **Released** page, select a work order in the table.
   The **Work Order** page appears, displaying the status of the work order.
3. Select  in the navigation bar.
   The **Edit Work Order** window appears, displaying planned start and end dates of the work order.
4. In the box, enter a date and time when the work order is planned to begin.

   Note: You can also select  to select a date and time.
5. As needed, modify values in the **PLANNED END DATE**, **PLANNED START DATE** boxes.

   Note: You can also select  to select a date and time.
6. **Optional:** In the **PRIORITY** box, you can modify the priority of the work order.

   Note: The quantity must be a positive integer, where 1 denotes the highest priority and 0 denotes the lowest priority. If you do not enter a value in the **PRIORITY** box for a work order, a message appears indicating that you must enter a value.
7. Select **Update**.

Results

The changes made to the planned start and end dates of the work order are saved.

Accessing the Work Order Status

About Lot and Operation Status

As a supervisor, you can access the statuses of the lots and operations associated with a work order in the **Current Status** page of the Order Management application. You can also modify the lot number if you want to change the name of the lot.

The progress of work of all the serial numbers and operations indicates the overall status of a work order. In the Order Management application, the **All Serial/Lots** pane displays the statuses of the serial numbers, and the table in the **Current Status** page displays the statuses of the operations.

Note: During production, the status of a lot and an operation may differ as follows:

- When a lot is put on hold, the status of the operation associated with that lot can be In Progress.
- When a lot is scrapped, the operation associated with that lot can be cancelled.

About Lots

Depending on the quantity of the products to be manufactured, serial numbers or lots are created in the ERP system.

The following table describes the color-coded status indicators of a lot that appear in the Order Management application.

Status Indicator	Description
	Indicates that the lot is in the Ready status. This status indicator appears when a lot is ready to be executed.
	Indicates that the lot is in the In Progress status. This status indicator appears when the work on the lot is in progress.
	Indicates that the lot is scrapped. This status indicator appears when you scrap a defective lot.
	Indicates that the lot is in the On Hold status. This status indicator appears when the lot is put on hold.
	Indicates that the lot is in the Complete status. This status indicator appears when all the operations associated with the lot are completed.

About Operations

To manufacture each type of product, a sequence of steps must be performed. Each task or a set of tasks is called an operation.

Operation Status Indicators

The following table describes the color-coded status indicators of a serial number that appear in the Order Management application.

Status Indicator	Description
	Indicates that the operation is in the Ready status. This status indicator appears when a work order is ready to be executed.
	Indicates that the operation is in the In Progress status. This status indicator appears when an operation is clocked off, meaning you must clock on the operation before executing the operation.
	Indicates that the operation is in the On Hold status for the operation. For example, if the disposition method specified for a defect is *continue to process*, and the defect is re-evaluated during a future operation, that future operation is on hold. When the lot is ready for that future operation, the operation status is Ready or In Progress, and the lot status is On Hold.
	Indicates that the operation is in the Cancelled status. This status indicator appears when operation is cancelled on a Production Line.
	Indicates that the operation is in the Not Ready status. This status indicator appears when the work on an operation has not started.
	Indicates that the lot on which the operation must be performed has been scrapped.
	Indicates that the operation is in the Complete status. This status indicator appears when an operation and the quality variables associated with the operation is completed.

Access the Work Order Status

Procedure

1. In the **Order Management** page, select a value in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the respective application page, select a work order in the table.
   The **Current Status** page appears, displaying the status of the lots and operations associated with the work order. Refer to each field in the **Current Status** page as described in the following table.

Field	Description
STATUS	The status of the serial number or lot is indicated with a color-coded indicator. For more information, refer to the About Lots on page 39 topic.
SERIAL/LOT	The unique identifier of the serial number.
SEQUENCE NUMBER	The sequence in which the operation is performed in the lot.
CURRENT OP	The name of the operation that the operator is currently performing.

Field	Description
USER(S)	The name of the user who is currently working on the operation. If multiple users are working on the operation, the number of users appear in the USER(S) field for that operation.
CURRENT UNIT	The name of the unit where the lot is being produced.

3. **Optional:** In the **All Serials/Lots** pane, select a serial to view the status of the selected serial number.
4. **Optional:** Select  to modify the lot identifier.

   Note: You can modify multiple lot identifiers at the same time.

Accessing the Work Order History

About Work Order History

As a supervisor, you can access the events associated with a work order in the **History** page of the Order Management application. An event is created each time that a work order is created, a lot is put on hold, or a serial number is clocked on.

Access the Work Order History

Procedure

1. In the **Order Management** page, select a value in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the respective application page, select a work order.
   The **Current Status** page appears, displaying the status of the lots and operations associated with the work order.
3. Select the **History** tab.
   The **History** page appears, displaying the events associated with the work order in a table where the events appear in descending order of their time stamps based on the TIME STAMP field. Refer to each field in the **History** page as described in the following table.

Field	Description
ACTION	The event associated with the work order.
SERIAL/LOT	The unique identifier of the lot or serial number for which the event was created.
OPERATION	The name of the operation for which the event was created.
USER	The name of the user who worked on the action.
TIME STAMP	The time when the event was created.

Accessing the Work Order Summary

About Work Order Summary

As a supervisor, you can use the **Summary** page of the Order Management application to access the summary of lots and operations associated with a work order in the Ready, In Progress, and Completed

statuses. You can also view the users who worked on the operations and the time taken to complete each operation.

In the Order Management application, the **All Serial/Lots** pane displays the statuses of the serial numbers, and the table in the **Current Status** page displays the statuses of the operations.

Note: During production, the status of a lot and an operation may differ as follows:

- When a lot is put on hold, the status of the operation associated with that lot can be In Progress.
- When a lot is scrapped, the operation associated with that lot can be cancelled.
- When a defect is created in an operation, the lot appears in the In Progress status until that operation, and then the lot is put on hold. For example, if a defect is created in operation 30, the lot appears in the In Progress status until operation 20; the lot is put on hold in operation 30.

Access the Work Order Summary

Procedure

1. In the **Order Management** page, select a value in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the respective application page, select a work order in the table.
   The **Current Status** page appears, displaying the status of the lots and operations associated with the work order.
3. Select the **Summary** tab.
   The **Summary** page appears, displaying the summary of the lots and operations associated with the work order. Refer to each field in the **Summary** page as described in the following table.

Field	Description
STATUS	The status of the operation.
SERIAL/LOT	The unique identifier of the lot or serial number.
OPERATION	The name of the operation.
STARTED TIME	The start date and time of the operation. This value appears in the format mm/dd hh:mm.
COMPLETED TIME	The end date and time of the operation. This value appears in the format mm/dd hh:mm.
COMPLETED BY	The name of the user who worked on the operation.

Accessing the Clocked on and Clocked off Operations

About Clocked on and Clocked off Operations

As a supervisor, you can use the **Clocked on** page of the Order Management application to access the clocked on and clocked off operations in a work order. You can also clock off an operation if an operator has stopped working on the operation.

Using this page, you can:

- Access a list of operations and view the operators working on these operations.
- View the time the operator was clocked on to a lot while performing an operation.
- Clock off an operation for the operator.

Access the Clocked on and Clocked off Operations

Procedure

1. In the **Order Management** page, select a value in the **Line** drop-down list box.
   The **Released** page appears, displaying a list of work orders associated with the selected line.
2. In the respective application page, select a work order.
   The **Current Status** page appears, displaying the status of the lots and operations associated with the work order.
3. Select the **Clocked on** tab.
   The **Clocked on** page appears, displaying the clock on and clock off details of the operations. Refer to each field in the **Clocked on** page as described in the following table.

Field	Description
USER(S)	The name of the user who worked on the operation.
SERIAL/LOT	The unique identifier of the lot or serial number.
OPERATION	The name of the operation in the clocked-on or clocked-off status.
CLOCKED ON	The date and time when the operator clocked on the serial number for that operation. This value appears in the format mm/dd hh:mm.
CLOCKED OFF	The date and time when the operator clocked off the serial number for that operation. This value appears in the format mm/dd hh:mm.

Accessing the NCM Defects

About NCM Defects

As a supervisor, you can access the defects created on the operations when the materials produced do not conform to specifications within the manufacturing process. After an operator creates a defect on an operation in the Operations application or the Work Queues application, the associated serial number and operation are placed on hold, and the operators working on that serial number are clocked off. You can then access the defect details in the **NCM** tab in the Order Management application.

Chapter 5

Route Management

Topics:

Overview

Overview

As a supervisor, you can use Route Management to manage routes in the Plant Applications manufacturing execution system.

A route defines the process and operations required to manufacture a product. It specifies a list of operations you must perform on the components, and the order in which you must perform these operations.

A route contains the following components:

- Operations: An operation is the main work segment in a route. An operation is a sequence of tasks that you must perform to manufacture the product.
- Bill of materials (BOMs): A BOM contains BOM formulations that define a list of items and the quantity of each BOM item needed to produce a product.
- Properties: A property is an additional attribute that is assigned to a route or an operation to produce a product.
- Documents: A document is a reference material used to perform an operation (for example, standard operating procedure, circuit diagram).

Using Route Management, you can:

- Define the end-to-end workflow of using a route, which includes the sequence of operations for manufacturing a product.
- Release the route for use in a work order.
- Maintain the revision history of each released route.
- Define the bill of material (BOM) items that are required for each operation in a route.
- Link reference documents such as standard operating procedures, circuit diagrams, and other documents required to perform each operation.
- Assign properties to a route or an operation, and modify their default values.
- Create, copy, modify, release, archive, revise, and delete a route.

About Routes

A route defines the process and operations to manufacture a product. It also specifies the order in which you must perform these operations.

A route contains the following components:

- Operations: The main work segment in a route. An operation is a sequence of tasks that you must perform to manufacture the product.
- BOM: A list of materials used in an operation, along with the quantity that is required for each item. BOM formulations and BOM items are defined in Plant Applications. Each operation is linked to a BOM item.
- Documents: A document is a reference material used to perform an operation (for example, standard operating procedure, circuit diagram).

> **Routes in a Motor Manufacturing Unit**
>
> Suppose you want to create routes for a motor manufacturing unit. This involves manufacturing the following components and assembling them:
>
> - Shell

- Stator
- Rotor
- Endshields

In this case, you will create the following routes:

- Shell: Includes welding sheets of metal into cylindrical shape. In addition, the route includes reference documents, which contains latest diagrams of the steel rods and information on how to weld them.
- Stator: Includes assembling windings with the shells, and turning them to accommodate endshields.
- Rotor: Includes injecting the shaft, and verifying the load balance of the rotor.
- Endshields: Includes turning and drilling the endshields so that they can be fixed to the stator.
- Assembly: Includes assembling the stator, rotor, and enshields to produce the final product. This route can also include painting, testing, and packaging the product.

About Operations

An operation consists of tasks that you perform while producing a product (for example, drilling, turning, and painting). When you define a route, you define a set of operations that must be performed to complete the route. Each operation is associated with one or more pieces of equipment that are defined in Plant Applications.

Using Route Management, in addition to creating an operation, you can copy, modify, and delete an operation.

Operations in a Motor Assembly Route

Suppose you want to create a route for assembling the parts of a motor. The following tasks are involved in completing the route:

- Shell turning
- Stator and endshield assembling
- Rotor and endshield assembling
- Testing
- Painting
- Packaging

For each of these tasks, you will create an operation and associate it with one or more pieces of equipment as follows.

Operation	Equipment
Shell turning	The lathe machine
Stator and endshield assembling	The pneumatic bolt tightener
Rotor and endshield assembling	The pneumatic bolt tightener
Testing	• The testing workstation • The weighing machine

Operation	Equipment
Painting	The spray paint workstation
Packaging	• The packaging machine • The labelling machine

About Bill of Material (BOM)

A Bill of Material (BOM) contains BOM formulations that define a list of items and the quantity of each BOM item needed to produce a product. BOM items are defined and associated with BOM formulations in Plant Applications.

Using Route Management, you can perform the following tasks:

- Link a BOM formulation to a route.
- Link BOM items to operations in the route.

After the route is released and used in a work order, you can provide details on the actual quantity of BOM items that are consumed, using the Work Queue module. This allows you to keep a track of the quantity of material that is consumed.

About Properties

A property is an additional attribute that is assigned to a route or an operation to produce a product. Properties are defined and grouped under property groups in Plant Applications Administrator.

Using Route Management, you can assign a property group to a route, and provide values for custom properties that are specific to the route. For example, if the route is for assembling a motor, you can provide the material grade, ERP project number, and other details specific to the route.

You can assign a property group to a route or an operation.

About Documents

Using route management, you can add a document that contains reference material to perform an operation (for example, circuit diagram, standard operating procedure). To do so, you must first upload the document, and then attach it to the appropriate route.

Creating a Route

About Creating a Route

A route defines the process and operations required to manufacture a product. It also specifies the order in which you must perform these operations.

A route is used in a work order or a process order in the Plant Applications database. This work order or process order is associated with a purchase order created in the ERP system, and is imported into Plant Applications using the ERP Integration services.

To create a route and make it available for use in a work order or a process order, you must perform the following steps:

1. Add a route.
2. Create operations in the route.

3. Link each operation to one or more pieces of equipment and BOM items.

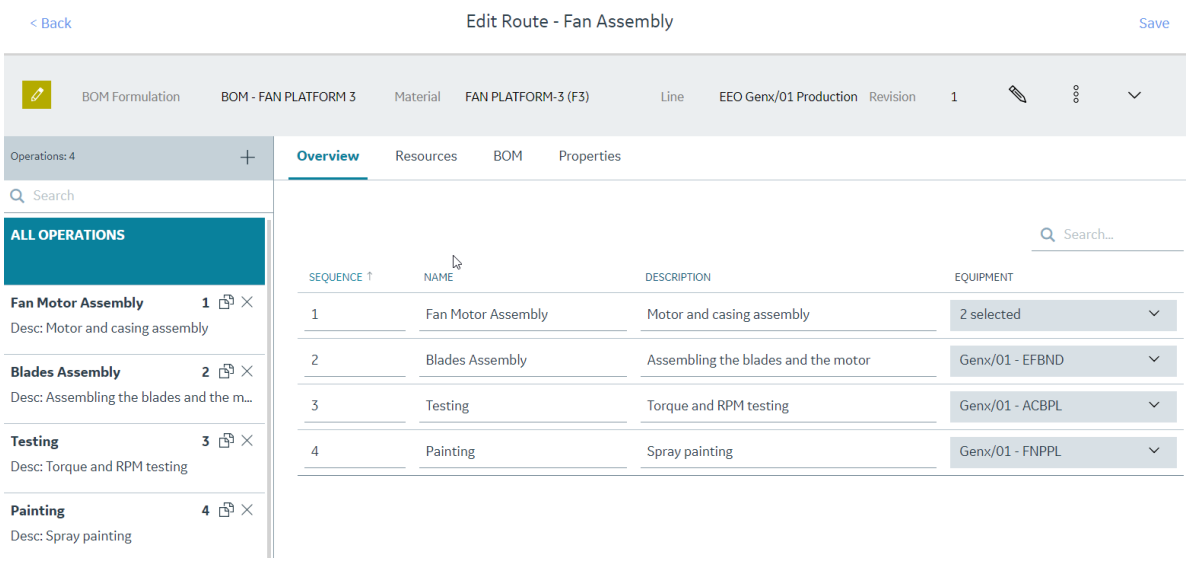
   Note: The equipment and BOM items exist in Plant Applications.
4. Assign property groups and underlying properties to the route or individual operations in the route.

   Note: The property groups are created in the Property Definition module.
5. Provide values to the underlying properties in each property group.

   Note: If a property contains a default value, you can retain it or modify it.
6. Attach a document to the route or individual operations in the route.

   Note: The document must exist in Apache CouchDB. If it does not exist, upload it to Apache CouchDB before attaching it.
7. Release the route.

When you access a draft route, the **Edit Route** page appears, as shown in the following image:



The **Edit Route** page contains the following sections:

- **Faceplate**: Contains details that you have provided while adding the route, such as name, description, product line, and other related information. This section also contains buttons to modify these details, and release, revise, archive, or delete the route. You can expand or collapse this section.
- **Operations**: Contains a list of operations in the route. You can select an operation to access its details and link it to one or more pieces of equipment. You can create, copy, or delete an operation in this section.
- **Resources**: Contains a list of equipment used for each operation. You can also access a list of operations assigned to each piece of equipment, and assign more operations.
- **BOM**: Contains a list of BOM items assigned to each operation, along with details on the quantity of BOM items required for the operation, units of measurement, and whether consuming the BOM items is mandatory to perform the operation. You can also assign a BOM item to each operation.
- **Properties**: Contains a list of property groups and underlying properties linked to the route or individual operations in the route, along with the default values, units of measurement, and data type, as specified in the Property Definition module. You can also assign a property group, and provide values for the underlying properties.
- **Documents**: Contains a list of documents that are attached to the route or individual operations in the route. You can upload a document to Apache CouchDB, attach it to the route or an operation, upload a new version of a document, and remove the document from the route or operation.

Add a Route

About This Task

This topic describes how to create a route. You can also copy an existing one.

Before You begin

The following components must exist in the Plant Applications database before you create a route:

- A production line linked to a single virtual unit
- Material defined for the production line
- BOM formulation defined for the material

If these components do not exist, contact the Plant Applications administrator.

Procedure

1. In the **Route Management** page, select  .
   The **Create Route** window appears. The **REVISION** box is disabled and populated with the value 1 because this is the first draft of the route.
2. Provide values as specified in the following table.

Field	Description
NAME	Enter a unique name for the route that does not exceed 100 characters.
DESCRIPTION	Enter a description for the route that does not exceed 1000 characters.
PRODUCTION LINE	Select a production line to which the route belongs. This box contains a list of production lines defined in Plant Applications Administrator. A value is required in this field.
MATERIAL	Select the material that you want to use in the route. This box is enabled after you select a value in the **PRODUCTION LINE** box. It contains a list of materials defined for the production line in Plant Applications.
BOM FORMULATION	Select the BOM formulation that you want to use in the route. This box is enabled after you select a value in the **MATERIAL** box. It contains a list of BOM formulations configured for the material in Plant Applications.

3. Select **Next**.

Results

The route is created and is in the draft state. The **Edit Route** page appears, allowing you to create an operation.

Next Steps

Add an operation to the route.

Copy a Route

About This Task

A copied route is in the draft state by default, regardless of the state of the original route. When you copy a route, the operations, BOM items, properties, and documents in the route are also copied.

This topic describes how to copy a route. You can also create a new one.

Procedure

1. In the **Route Management** page, perform one of the following tasks:
   - If you want to copy a route in the draft state, select the route that you want to copy.
     The **Edit Route** page appears.
   - If you want to copy a route in the released or archived state, select **Released** or **Archived**, respectively, and then select the route that you want to copy.
     The **View Route** page appears.
2. Select  , and then select **Duplicate**.
   The **Copy Route** window appears.
   - The **NAME** box contains a value in the following format: Copy of <name of the original route>
   - The **REVISION** box is disabled and populated with the value 1, regardless of the value in the **REVISION** box of the original route. This is because this is the first draft of the copied route.
   - The remaining boxes are populated with the corresponding values in the original route.
3. Enter a unique name for the copied route. The name must not exceed 100 characters.
4. As needed, modify values in the remaining boxes, and then select **Copy**.

Results

The route is copied. You can now add or remove operations, property groups, and documents to the copied route. You can also change the BOM items and equipment linked to the operations.

Create an Operation

About This Task

An operation is an activity that consists of steps that you perform while producing a product.

You can create operations in a route that is in the draft state. However, if you want to create an operation in a released or archived route, you must first revise the route.

When you create an operation, you can set the sequence of the operation, and select the equipment used for that operation.

This topic describes how to create an operation. You can also copy an existing one.

Before You begin

Create a route.

Procedure

1. In the **Route Management** page, select the route for which you want to create an operation.

The **Edit Route** page appears, displaying a list of operations in the route.

2. Select  .
   A blank row appears in the **Overview** section.
3. Provide values as specified in the following table.

Column	Description
SEQUENCE	Enter the sequence number of the operation. By default, the value in this column is 1. If you want to perform multiple operations simultaneously (that is, for parallel tasks), provide the same sequence number. **Tip:** When setting the sequence numbers, provide a gap in their values so that you can easily add new operations between other operations. For example, if the sequence number of the first operation is 1, set the sequence number of the second operation to 10. This allows you to add new operations between these two operations without the need to modify the sequence numbers of all the operations.
NAME	Enter a unique name for the operation that does not exceed 100 characters. **Note:** The name must be unique among all operations in the route.
DESCRIPTION	Enter a description for the operation that does not exceed 1000 characters.
EQUIPMENT	Select the equipment that is used to perform the operation. You can select multiple pieces of equipment for the same operation, and you can select the same piece of equipment for multiple operations. When you select multiple pieces of equipment, the selected number appears. You can select the drop-down list box to view the selected pieces of equipment. **Tip:** You can also select the equipment used in an operation from the **Resources** section.

Results

The operation is created and added to the route.

Next Steps

Link a BOM item to the operation.

Link a BOM Item to an Operation

About This Task

A bill of material (BOM) contains BOM formulations that define a list of items and the quantity of each BOM item needed to produce a product. You can link a BOM item to a *single* operation. You can link multiple BOM items to an operation.

Before You begin

- Ensure that the route is linked to the BOM formulation that is associated with the BOM items that you want to link. To do so, in the **Edit Route** window of the route, select the appropriate value in the **BOM Formulation** box.

- Create an operation in the route.

Procedure

1. Access the route that is linked to the operation to which you want to link a BOM item.
   The **Edit Route** page appears, displaying a list of operations linked to the route.
2. Select **BOM**.
   The **BOM** workspace appears, displaying a list of BOM items in the **PRODUCT DESCRIPTION** column. The **SEQUENCE**, **PRODUCT CODE**, **QT PER**, and **UOM** columns are populated with the sequence number of the BOM item, the product code, the quantity needed per operation, and the units of measure of the associated BOM formulation, respectively. You cannot modify these values.
3. For each operation, select a value in each column as described in the following table.

   Note: You can link a BOM item to an operation only if **ALL OPERATONS** is selected in the **Operations** section.

Column	Description
OPERATION	Contains a list of operations that you have added to the route. Select the operation that you want to link to the BOM item. You can select just *one* of the operations. If a BOM item is already assigned to an operation, the operation does not appear in the list.
MANDATORY	Identifies whether the BOM item is required to perform the operation. By default, the value in this box is **No**.

4. Select **Save**.

Results

Each BOM item is linked to the selected operations.

Next Steps

Attach a document to the route.

Upload a Document

About This Task

Using route management, you can add a document that contains reference material to perform an operation (for example, circuit diagram, standard operating procedure). To do so, you must first upload the document, and then attach it to the appropriate route.

When you upload a document, it is stored in a document store application named Apache CouchDB.

Before You begin

Apache CouchDB must be installed, and the credentials must be provided while installing Plant Applications Universal Client. For more information, contact your administrator.

Procedure

1. In the **Route Management** page, select the route for which you want to upload a document.
2. Select **Documents**, and then select  .
   The **Upload document** window appears.

3. Provide values as specified in the following table.

Box	Description
FILE NAME / URL	Identifies the URL or path to the document. The URL must use the HTTPS protocol. **Tip:** If the document is stored in the local machine or in a network location accessible from the local machine, you can select **Browse** to go to the path.
NAME	Identifies the name of the document. Enter a unique value that does not exceed 100 characters. **Important:** If a document with the same name exists, a new version of the same document is created, and is assigned the product line, material, and equipment of the original document. Therefore, you must ensure that the document name is unique among all the documents stored in the Plant Applications file store.
ENGINEERING REVISION #	Identifies the revision number of the document as specified in your organization. For example, if the document that you want to upload is a design document of revision number 15, enter 15. **Note:** The engineering revision number is different from the revision number maintained in the document store.
DESCRIPTION	Identifies the description of the document. You must enter a value.
ASSOCIATION TYPE	Identifies whether the document is associated with the product line, material, or piece of equipment that you select in the **ASSOCIATION VALUE** box.
ASSOCIATION VALUE	Identifies the product line, material, or piece of equipment with which the document is associated. This field contains a list of values of the type that you select in the **ASSOCIATION TYPE** box. For example, if you select **Product Line** in the **ASSOCIATION TYPE** box, the **ASSOCIATION VALUE** box contains a list of product lines in Plant Applications.

4. Select **Upload**.

Results

The document is uploaded to the document store.

Next Steps

Attach the document to a route or an operation.

Attach a Document

About This Task

You can attach a document to an operation or a route so that an operator can refer to it when performing the operation.

Before You begin

Upload the document that you want to attach.

Procedure

1. In the **Route Management** page, select the route to which you want to attach a document.
2. Select **Documents**.
   A list of documents attached to the route or to an individual operation in the route appears.

   Tip: You can access a list of documents attached to each operation by selecting the corresponding operation.
3. If you want to attach the document to the route, select **ALL OPERATIONS**. If you want to attach the document to an operation, select the operation.
   A list of documents attached to the route or operation appears.
4. Select  .
   The **Attach Documents and/or URLs** window appears, displaying a list of documents that are available.

   Tip:

   - You can preview a document by selecting the URL in the **FILE/URL** column.
   - By default, the latest version of each document appears in the list. If you want to attach a previous version of a document, in the row containing the document, select  .
5. In each row containing the document that you want to attach, select the check box.

   Tip: You can select all the documents in the list by selecting the check box in the column heading.
6. Select **Attach**.

Results

The document is attached to the route or operation.

Next Steps

Assign a property group to the route or operation.

Assign a Property Group

About This Task

When you assign a property group to a route, you can provide values for custom properties that are specific to the route. For example, if the route is for assembling a motor, you can provide the assembly line number, types of motors that are normally assembled on the line, and other details specific to the route.

You can assign a property group to a route or an operation.

Before You begin

Ensure that the property group and underlying properties have been defined in the Property Definition module. For more information, refer to Property Definition.

Procedure

1. In the **Route Management** page, select the route to which you want to assign a property group.
2. Select **Properties**.
   A list of property groups assigned to the route appears.
3. If you want to assign a property group to an operation, select the operation. If you want to assign a property group to the route, select **ALL OPERATIONS**.

4. Select  .
   The **Assign Property Group(s)** window appears.
5. Select the check boxes corresponding to the property groups that you want to assign.

   Tip: If you want to assign all the property groups, select the check box in the heading.
6. Select **Assign**.

Results

The selected property groups are assigned to the route or operation.

Tip: By default, the latest version of each property is assigned to the route or operation. If you want to assign an earlier version, select  in the **ACTIONS** column, and then select the version that you want to assign.

Next Steps

Provide values for each property in the group.

Provide Values for Properties

About This Task

When properties are defined in Plant Applications, default value for each property may be provided. Using Route Management, you can provide values for each property (and overwrite default values if they exist).

Before You begin

Assign a property group to the route or operation.

Procedure

1. In the **Route Management** page, select the route for which you want to provide values for properties.
2. Select **Properties**.
   A list of property groups assigned to the route appears.

   Tip: If the property has been assigned to an operation, you can select the operation to access a list of property groups assigned to the operation (instead of accessing property groups assigned to all the operations in the route).
3. Select  corresponding to the property group for which you want to provide values.
   A list of properties in the property group appears. If a default value has been provided for a property in the Property Definition module, it appears in the **VALUE** column.
4. Enter or modify the value in the **VALUE** column for each property for which you want to provide a value. The following conditions apply when you provide a value for a property:
   - If a property has been specified as mandatory in the Property Definition module, you must provide a value for the property.
   - The value must be of the same data type as specified in the **DATA TYPE** column.
5. Select **Save**.

Results

The values for the properties are saved.

Next Steps

Release the route.

Modifying a Route

About Modifying a Route

You can modify a route only if it is in the draft state. You can modify a route to perform one or more of the following tasks:

- Modify the details of a route
- Modify the details of an operation
- Link a different BOM item to an operation
- Create an operation
- Copy an operation
- Delete an operation
- Upload a document
- Attach a document to a route or an operation
- Upload a new version of a document
- Remove a document
- Assign a property group to a route or an operation
- Provide values for properties in a property group
- Remove a property group

Note: By default, the **Route Management** page contains only the latest revision of each route. If you want the list to contain all the revisions of each route, contact your administrator to modify the settings in the Plant Applications Administrator application.

Modify a Route

Procedure

1. In the **Route Management** page, select the route that you want to modify.
   The **Edit Route** page appears.
2. Select  .
3. As needed, modify values as specified in the following table.

Field	Description
NAME	Identifies the name of the route. Enter a unique value that does not exceed 100 characters.
DESCRIPTION	Identifies the description for the route. Enter a value that does not exceed 1000 characters.
BOM FORMULATION	Identifies the BOM formulation that you want to use in the route. This box contains a list of BOM formulations configured for the material in Plant Applications Administrator. You can select a value.

   Note: You cannot modify values in the **REVISION**, **PRODUCTION LINE**, and **MATERIAL** boxes.
4. Select **Update**.

Results

The changes made to the route are saved.

Modify an Operation

You can modify an operation if you want to change the name, description, equipment, or sequence of the operation.

Procedure

1. In the **Route Management** page, select the route containing the operation that you want to modify. The **Edit Route** page appears, displaying a list of operations in the route.
2. As needed, modify values as specified in the following table.

Column	Description
SEQUENCE	Identifies the sequence number of the operation. By default, the value in this column is 1. If multiple operations must be performed simultaneously, provide the same sequence number. **Tip:** When setting the sequence numbers, provide a gap in their values so that you can easily add new operations between other operations. For example, if the sequence number of the first operation is 1, set the sequence number of the second operation to 10. This allows you to add new operations between these two operations without the need to modify the sequence numbers of all the operations.
NAME	Identifies the name for the operation. Enter a unique name for the operation that does not exceed 100 characters. **Note:** The name must unique among all operations in the route.
DESCRIPTION	Identifies the description for the operation. Enter a description that does not exceed 1000 characters.
EQUIPMENT	Identifies the equipment that is used to perform the operation. You can select multiple pieces of equipment for the same operation, and you can select the same piece of equipment for multiple operations. **Tip:** You can also select the equipment used in an operation by accessing the **Resources** section.

3. Select **Save**.

Results

The changes made to the operation are saved.

Copy an Operation

About This Task

This topic describes how to copy an operation. You can also create a new operation.

Procedure

1. In the **Route Management** page, select the route in which you want to copy an operation. The **Edit Route** page appears.

2. In the left pane, in the row containing the operation that you want to copy, select  .
   A new row for the copied operation appears in the **Overview** section.
   - The name of the copied operation is in the following format: Copy <name of the original operation>
   - The remaining columns are populated with the corresponding values in the original operation.
3. Enter a unique name for the operation. The name must not exceed 100 characters.
4. As needed, modify values as specified in the following table.

Column	Description
SEQUENCE	Identifies the sequence number of the operation. If multiple operations must be performed simultaneously, provide the same sequence number. **Tip:** When setting the sequence numbers, provide a gap in their values so that you can easily add new operations between other operations. For example, if the sequence number of the first operation is 1, set the sequence number of the second operation to 10. This allows you to add new operations between these two operations without the need to modify the sequence numbers of all the operations.
NAME	Identifies the name for the operation. Enter a unique name that does not exceed 100 characters.
DESCRIPTION	Identifies the description for the operation. Enter a description that does not exceed 1000 characters.
EQUIPMENT	Identifies the equipment that is used to perform the operation. You can select multiple pieces of equipment for the same operation, and you can select the same piece of equipment for multiple operations. **Tip:** You can also select the equipment used in an operation from the **Resources** section.

5. Select **Save**.

Results

The operation is copied.

Next Steps

Link a BOM item to the operation.

Delete an Operation

You can delete an operation if it is no longer needed to produce the product using the route.

Before You begin

- If you have made any changes to the route, save the changes.

Procedure

1. In the **Route Management** page, select the route for which you want to delete an operation.
   The **Edit Route** page appears.
2. In the left pane, select  in the row containing the operation that you want to delete.
   A message appears, asking you to confirm that you want to delete the operation.

3. Select **Yes**, and then select **Save**.

Results

The operation is deleted.

Note: The equipment linked to the operation is not deleted.

Upload a New Version of a Document

About This Task

Using Route Management, you can maintain the revision history of documents that you upload to the document store.

You can upload a new version of a document whether or not it is attached to a route or an operation. If the document has already been attached to a route or an operation, after you upload the new version, this newer version is used in the route or the operation. You can, however, use an earlier version of the document if needed.

Procedure

1. If the document has been attached to a route or an operation, perform the following steps:
   a) In the **Route Management** page, select the route to which you have attached the document.
   b) Select **Documents**.
   A list of documents attached to the route or to an individual operation in the route appears.

   Tip: You can access a list of documents attached to each operation by selecting the corresponding operation.

   c) In the row containing the document for which you want to upload a new version, select  .
   The **Upload document** window appears. With the exception of the **FILE NAME / URL** box, all the boxes are disabled and populated with values from the previous version of the document.
   d) In the **FILE NAME / URL** box, enter the URL or path to the version of the document that you want to upload.

   Tip: If the document is stored in the local machine, you can select **Browse** to go to the path.
   e) Select **Upload**.
   The new version of the document is uploaded. All the routes and operations to which the document has been attached now use the version that you have uploaded.

   Note: You can access each version of the document by selecting  in the row that contains the document.
2. If the document has not been attached to a route or an operation, perform the following steps:
   a) In the **Route Management** page, select a route.
   b) Select **Documents**.
   c) In the upper-right corner of the **Documents** section, select  .
   The **Upload Document** window appears.
   d) Provide the same values as those provided for the previous version of the document, and then select **Upload**.
   The new version of the document is uploaded.

Note: You can access each version of the document by selecting  , and then selecting  in the window that appears.

Releasing a Route

About Releasing a Route

A route must be released for it to be available in a work order or a process order. The following conditions apply when you release a route:

- You can release a route only if it is in the draft state.
- You cannot release a route that is archived.
- You cannot modify a route that is released. However, you can revise or copy the route after it is released.
- After you release a route, you cannot reverse the action.

Release a Route

Before You begin

- The route that you want to release must contain at least one operation.
- Each operation in the route must be associated with at least one piece of equipment and a BOM item.

Procedure

1. In the **Route Management** page, select the route that you want to release.
   The **Edit Route** page appears.
2. Select  , and then select **Release**.
   A message appears, specifying that the action cannot be reversed, and asking you to confirm that you want to release the route.
3. Select **Release**.

Results

The route is released. This route is now available to be linked to a work order or a process order.

Next Steps

Use the route in a work order or a process order.

Note: A work order or process order is created in an Enterprise Resource Planning (ERP) application and imported into Plant Applications Universal Client using the Plant Applications Enterprise Resource Planning (ERP) scheduler and import services. For more information, refer to the Plant Applications ERP Integration Guide. The work order or process order is then consumed in the Order Management, Operations, Work Queue, and other modules. For more information, refer to corresponding sections of the documentation.

Archiving a Route

About Archiving a Route

If you no longer want to use a route, you can archive it. The following conditions apply when you archive a route:

- You can archive a route that is in the released state.
- You cannot archive a route that is in the draft state.
- You cannot modify an archived route. However, if you want to use an archived route in future, you can revise or copy the route.
- An archived route is not available for use in a work order or a process order.
- After you archive a route, you cannot reverse the action.

Archive a Route

Procedure

1. In the **Route Management** page, select **Released**, and then select the route that you want to archive. The **View Route** page appears.
2. Select  , and then select **Archive**.
   A message appears, specifying that the action cannot be reversed, and asking you to confirm that you want to archive the route.
3. Select **Archive**.

Results

The route is archived.

Revising a Route

About Revising a Route

After you release or archive a route, you cannot modify it. However, if you want to update the route (for example, remove an operation or change the BOM formulation), you can revise it. The following conditions apply when you revise a route:

- You can revise a route that is in the released or archived state.
- You cannot revise a route in the draft state.
- You can revise only the latest version of a route.

Revise a Route

Procedure

1. In the **Route Management** page, perform one of the following tasks:
   - If you want to revise a released route, select **Released**.

- If you want to revise an archived route, select **Archived**.

2. Select the route that you want to revise.
   The **View Route** page appears.
3. Select  , and then select **Revision**.
   The **Revise Route** window appears, displaying the route details.

   Note: The name, description, production line, material, and BOM formulation are copied from the latest revision of the route. You cannot modify these details. You can add, modify, or remove an operation. You can also assign a different BOM item, equipment, property group, or document.
4. Select **Next**.
   The **Edit Route** page appears. The operations, resources, BOM items, properties, and documents linked to the route are the same as that of the previous version of the route.
5. As needed, add, modify, or remove operations, or assign a different BOM item, property, or document.
6. Select **Save**.

Results

The route is revised and is in the draft state. The value in the **REVISION** box is incremented by 1.

Tip: To access the revision history of the route, in the **Released** or **Archived** section, select  in the row containing the route.

Deleting a Route

About Deleting a Route

If you no longer want to work with a draft route, you can delete it. The following conditions apply when you delete a route:

- You cannot delete a route that is released or archived.
- You can only delete a route that is in the draft state.
- The operations in the route are deleted.
- The BOM items, properties, and documents used in the route are not deleted from the Plant Applications database.

Delete a Route

Procedure

1. In the **Route Management** page, select the route that you want to delete.
   The **Edit Route** page appears.
2. Select  , and then select **Delete**.
   A message appears, asking you to confirm that you want to delete the route.
3. Select **Delete**.

Results

The route and the operations linked to it are deleted.

Creating a Work Order

About Creating a Work Order

A work order is a request to manufacture certain quantity of a product in a given time. It contains information about the product, the quantity to be manufactured, the planned start time and end time, a serial number, and the route that must be used to manufacture the product.

Work orders are created in Plant Applications from the following sources:

- ERP System: You can import work orders from an ERP system to Plant Applications using the import services.
- Route Management: You can create work orders manually using Route Management.

These work orders then appear in Order Management, where you can manage them.

When you create a work order in Route Management, the following conditions apply:

- You can create a work order only for the latest version of a released route.
- You cannot create a work order for a draft or an archived route.
- A work order belongs to a single route. You can, however, create multiple work orders for a route.

Create a Work Order

Procedure

1. In the **Route Management** page, select **Released**.
   A list of released routes appears.
2. Select the route for which you want to create a work order.
   The **View Route** page appears.
3. Select  , and then select **Create Work Order**.
   The **Create Work Order** window appears.
4. Provide values as specified in the following table.

Box	Description
WORK ORDER	You must enter a value in this box. Enter a unique name for the work order that does not exceed 100 characters. If a work order with the same name exists: • If the work order is ready, it is deleted and replaced with the one that you are creating. • If the work order is in progress, you cannot create this work order.
ORDER QUANTITY	Enter the quantity of the product that must be manufactured as part of the work order. The value in this box must not exceed 100. The value in this box determines the number of rows that appear in the **ENTER SERIAL/LOT#** section.

Box	Description
PRIORITY	Enter the priority in which the work order must be completed. • If you want to assign the highest priority for the work order, enter 1. • If you want to assign the lowest priority for the work order, enter 0 or leave the box blank.
SERIAL/LOT# PREFIX	Enter the prefix for each serial number in the lot. The value in this box helps identify the serial numbers that belong to the same work order.
PLAN START	Enter the planned date and time to begin work on the work order.
PLAN END	Enter the planned date and time to complete the work on the work order. By default, this box is populated with the date and time that is 24 hours from the current date and time.
SERIAL/LOT#	You must enter a value in all the rows. Enter a unique serial number for each lot.
GENERATED SERIAL/LOT#	Identifies the serial number that will be assigned to each lot in the work order. This box is disabled and populated with a combination of the values in the **SERIAL/LOT# PREFIX** and **SERIAL/LOT#** boxes.

5. Select **Create**.

   Tip: If you want to create another work order for the same route, select **Create and Add Another**.

Results

The work order is created, and it appears in Order Management.

Chapter 6

Work Queue

Topics:

Overview

Overview

As an operator, you can use the Work Queue module for maintaining a list of operations that you must perform, and report the status of completion of each operation.

Each row in the work queue represents an operation to be performed. By default, the work queue contains the operations in which at least one serial number is currently clocked on by you. You can add additional operations that are ready or in progress to the work queue.

Using the Work Queue module, you can perform the following tasks:

- Add a list of operations to the work queue.
- View a list of operations that are available.
- Clock on and off a serial number.
- Specify the number of BOM items consumed for each serial number.
- View the status of an operation.
- View a list of documents related to an operation.
- Provide quality variables data for each serial number.
- Specify whether you have completed working on a serial number.

About Work Orders, Operations, and Serial Numbers

A work order is a request to manufacture a certain quantity of products in a given time. It contains information on the model, route, and quantity of a product that must be manufactured. Work orders are either created in Route Management or imported into Plant Applications using the Enterprise Resource Planning (ERP) scheduler and import services.

To manufacture each type of product, a sequence of activities must be performed. Each task or a set of tasks is called an operation. Operations can be defined either in the route using the Route Management module or in the work order that you import from an ERP system.

The quantity of the product to be manufactured determines the number of serial numbers that are created.

Work Orders, Operations, and Sequence Numbers in a Motor Manufacturing Unit

Suppose you want to manufacture the following motors:

- 3 motors of model A
- 2 motors of model B

The following table provides the work orders, operations, and serial numbers for the plan.

Work Order Number	Work Order Description	Operations	Serial Numbers
W.O 1	To manufacture motors of model A	• Shell turning • Rotor assembling • End shield assembling • Painting	• W.O. 1_S1 • W.O. 1_S2 • W.O. 1_S3
W.O 2	To manufacture motors of model B	• Shell turning • Rotor assembling • End shield assembling	• W.O. 2_S1 • W.O. 2_S2

Suppose Operator 1 wants to work on the shell turning operation for the two types of motors. Operator 1 can clock on the following serial numbers.

Work Order Number	Operation	Serial Number
W.O 1	Shell turning	W.O.1_S1
W.O 1	Shell turning	W.O.1_S2
W.O 1	Shell turning	W.O.1_S3
W.O 2	Shell turning	W.O.2_S1
W.O 2	Shell turning	W.O.2_S2

Suppose Operator 2 wants to work on the rotor assembling operation. When Operator 2 logs in to the application, the work queue displays the rotor assembling

operation only after the shell turning operation has been completed for at least one serial number.

About the Status of a Serial Number and an Operation

The status of an operation indicates the progress of work for the operation.

The status of a serial number indicates the progress of work on the serial number *for that specific operation*. For example, suppose a work order includes performing operations 1 and 2. If operation 1 has been completed for a serial number, the status of the serial number for operation 1 is *complete*. If operation 2 is yet to begin on the same serial number, the status of the serial number for operation 2 is *ready*.

In the Work Queue module, the status of a serial number or an operation is automatically determined and displayed with a color-coded indicator. The following table provides a list of status indicators defined for a serial number and an operation.

Status	Status Indicator	Description for a Serial Number	Description for an Operation
Not ready		Indicates that the serial number is not available for you to clock on (for example, the job is still undergoing the previous operation).	Indicates that none of the serial numbers is available for you to perform the operation.
Cancelled		Indicates that the work for the serial number has been cancelled. This happens if a defect has been created for the serial number, and the disposition provided in NCR Management is Scrapped.	Not applicable
Ready		Indicates that the serial number is available for you to perform the operation.	Indicates that at least one serial number in the operation is available for you to perform the operation, and the operation is not in progress for any of the serial numbers.
Clocked on by you		Indicates that the serial number is currently clocked on only by you.	Indicates that at least one serial number in the operation is currently clocked on by you, and none of the serial numbers in the operation are clocked on by others.
Clocked on by another user		Indicates that you have clocked off the serial number.	Indicates that you have clocked off the serial numbers in the operation.
Clocked on by other users		Indicates that you have clocked off the serial number, and other users have either clocked on or clocked off the serial number.	Indicates that multiple other users have clocked on or clocked off the serial numbers in the operation, and you have not clocked on any of the serial numbers in the operation.
Clocked on by you and other users		Indicates that the serial number is currently clocked on by you and other users.	Indicates that the serial numbers in the operation are currently clocked on by you and other users.

Status	Status Indicator	Description for a Serial Number	Description for an Operation
Clocked on by other users in the past		Indicates that the serial number was clocked on in the past, but is now clocked off.	Indicates that at least one serial number in the operation was clocked on in the past by others, but is now clocked off, and, currently, no serial number in the operation is clocked on.
On hold		Indicates that the serial number is on hold. This status indicator appears if a defect has been created for the serial number. After the defect is closed, the status is changed to in progress.	Not applicable
Complete		Indicates that the serial number is complete.	Indicates that the operation is complete (that is, all the serial numbers in the operation are either complete or scrapped). **Note:** When an operation is complete, it no longer appears in the work queue.

About BOM Items

The bill of materials (BOM) is a list of formulation items required to manufacture a product. In the Work Queue module, you can access a list of BOM parts or items associated with an operation within a Production Unit and consume them during production. A BOM item is represented by the BOM part number.

The color of a row in the list of BOM items indicates the requirement type and the consumption status of a BOM item as described in the following table.

Color	Description
Pink	Indicates that the BOM item is mandatory to complete an operation. When you select a mandatory BOM item, the page containing the item details and consumption history displays the **MANDATORY** label. To complete an operation, you must consume all the mandatory BOM items in the operation. The **BOM** section displays the quantity of mandatory BOM items required to complete an operation when the following conditions are true: • The required BOM items are not consumed for an operation. • The quantity of BOM items consumed is less than the required quantity of the BOM items.
White	Indicates that the BOM item is not mandatory to complete an operation (that is, BOM items are supplementary for an operation).
Blue	Indicates that consuming the BOM item is mandatory and the BOM item is consumed while executing an operation during production. The BOM item row turns blue when the consumed quantity of the BOM item is greater than or equal to the required quantity of the BOM items for that operation.

Adding Operations to the Work Queue

About Adding Operations to the Work Queue

Each row in the work queue represents an operation to be performed. By default, the work queue contains the operations that meet at least one of the following criteria:

- Operations in which at least one serial number has been clocked on
- Operations that you previously added to the work queue, but not completed

In addition, you can add an operation or all the available operations in a work order to the work queue. You can add an operation if at least one serial number is available for you to begin work.

Adding operations to the work queue has the following advantages:

- Extends the list of operations that you want to perform
- Provides visibility on the progress of work that you plan to complete.

To add operations, you can enter the serial number (on which you want to perform an operation) manually or scan the bar code. You can also enter the name of the operation or work order.

Note: If you add operations by entering operation names, all the operations with that name are added to the work queue, regardless of the work order associated with each of them. Therefore, we recommend that you add operations by entering the serial numbers or work order names instead of entering operation names.

Add Operations to the Work Queue

Before You begin

If you want to add operations by scanning the bar code of a serial number, ensure that the camera has been enabled.

Procedure

1. In the **Work Queue** page, in the **Enter a serial/lot no. or work order or operation to add to queue** box, enter the name of the operation or work order that you want to add to the work queue. You can also enter a serial number on which you want to perform an operation.
2. Select  .

   Tip: You can also scan the bar code of the serial number by selecting  .

Results

- If you entered (or scanned) a serial number, the operations that you can perform on the serial number are added to the work queue.
- If you entered the name of an operation, all the operations that contain the name and are ready are added to the work queue.
- If you entered the name of a work order, all the operations in the work order are added to the work queue.

Next Steps

Complete the operation.

Completing an Operation

About Completing an Operation

Completing an operation involves performing the operation on all the parts (that is, jobs) as specified in the work order. To complete an operation on a part, you must perform the following tasks:

1. Clock on the serial number associated with each part on which you want to perform the operation. You can refer to the documents that appear in the **Documents** section for instructions or any other reference material.
2. Specify the consumption of BOM items for each serial number. Only if all the mandatory BOM items have been consumed for all the serial numbers, you can mark the operation complete.
3. Provide data for quality variables that have been defined for the operation in Plant Application Administrator.
4. If needed, create a defect for the serial number.
5. Mark the operation complete for each serial number on which you have performed the operation.

After all the operations in a work order are completed, the work order is marked complete in Plant Applications. You can view the completion status of the work order in Order Management.

Clock On a Serial Number

About This Task

Before you work on an operation, you must clock on the serial numbers on which you want to work. It provides visibility to the supervisor on the progress of work for the operation in Order Management.

You can clock on multiple serial numbers at the same time. In addition, multiple users can clock on a single serial number.

Before You begin

You can clock on a serial number only if it is ready or in progress (that is, already clocked on by other users).

Procedure

1. In the **Work Queue** page, in the row containing the operation on which you want to begin work, select the **ON** button.

   Note: If the serial number has not been assigned to you or has not been clocked on by other users, the operation will not appear in the work queue. In that case, add the operation to the work queue.

   The **Select Serial Number(s) to Clock On** window appears, displaying a list of serial numbers in the operation that are available.
2. In the **EQUIPMENT** box, select the piece of equipment that you will use to perform the operation.
3. If you want to clock on all the available serial numbers, select the check box in the heading row of the table.
4. If you want to clock on selected serial numbers, perform one of the following steps:
   - Select the check box for each serial number that you want to clock on.

- Search for a serial number by entering the value in the **Search in available serial numbers** box, and then select the check boxes from the filtered list that appears.
- Scan the bar code of the serial number by selecting .

5. Select **Clock On**.

Results

The selected serial numbers are clocked on. In the **Work Queue** page, the number of serial numbers that are clocked on is updated in the **OFF/ON** column.

Next Steps

Access documents related to the operation.

Access Documents

About This Task

You can access the documents that are related to an operation. The documents can be instruction manuals or technical publications associated with the operation. They have been added to the corresponding product line, equipment, or material using the Route Management module or the ERP system.

Procedure

1. In the **Work Queue** page, select the operation on which you want to work.
   The **Documents** section appears, providing a list of documents associated with the operation.
2. Select the document that you want to access.

Results

The document appears in the workspace.

Tip: You can rotate the document.

Next Steps

Perform the operation, and specify the consumption of BOM items for the operation.

Specify Consumption of BOM Items for an Operation

About This Task

Consuming a BOM item represents the process of utilizing a BOM item within an operation. The BOM items required to complete an operation are defined in the Route Management module or in the ERP system, along with details on whether using a BOM item is mandatory to complete the operation.

Using the Work Queue module, you can specify the quantity of BOM items that have been consumed for each serial number. You can complete an operation only if all the required BOM items for each serial number in the operation are consumed.

Before You begin

Clock on the serial numbers for which you want to specify BOM consumption.

Procedure

1. In the **Work Queue** page, select the operation for which you want to specify the consumption of BOM items.
2. Select **BOM**.
   A list of serial numbers appears in the **SERIAL NUMBERS** subsection.
3. Select the serial number for which you want to specify the consumption of BOM items.
   A list of BOM items for the selected serial number appears in the workspace.
4. Select the BOM item whose consumption you want to specify.
   A window appears, providing information on the required quantity of the BOM item, whether consuming the BOM item is mandatory to complete the operation, and the quantity that has been already consumed for the serial number.
5. In the **SERIAL/LOT#** box, enter the serial number or lot number of the BOM item that you want to consume in the operation. Alternatively, to search for a lot by using a barcode, select  , and then scan for the barcode of the lot associated with the BOM item. Only the barcodes of standards Code 39 and Code 128 are supported.

   Note: The **SERIAL/LOT#** box and the  button are available only when the operation associated with the BOM item is clocked on. Else, you can access only the consumed history for that BOM item. The search result of the **SERIAL/LOT#** box is not case-sensitive.

   The Available: <*quantity_of_items*> message displays the quantity of BOM items available in the lot for consumption. If the required quantity of the BOM items specified in the **REQUIRED QTY** box is less than or equal to the quantity available in the lot, the Available: <*quantity_of_items*> message appears in grey, else the message appears in red. In the **REQUIRED QTY** box, if you enter a lot number of a lot that is unavailable in the Plant Applications database or enter a value more than the available quantity in the lot, an informational message appears in red as described in the following table.

Informational Message Name	Message Condition	Corrective Actions
Available: <*quantity_of_items*>	The available quantity in the lot is less than the required quantity specified in the **REQUIRED QTY** box.	Do one of the following tasks: • Consume the available quantity of the BOM item from the existing lot, and then consume the remaining quantity from another lot. • Search for another lot that contains the total required quantity of the BOM item, and then consume the BOM item.
Serial/Lot Not Found	The lot number or serial number is invalid.	Ensure that the lot is available in the database. You can create a lot on a machine and then consume the BOM items from the lot.
This serial/lot is currently not available. Production status = consumed,Current quantity = <*value*>.	The lot is not available in the database for consumption.	Search for another lot that contains BOM items, and then consume the BOM item.
Lot identifier is found but not available for consumption	The selected lot does not contain BOM items to consume.	Search for another lot that contains BOM items, and then consume the BOM item.
Serial/lot does not match the material being consumed	The BOM item material differs from the material in the lot being consumed.	Ensure that the material in the BOM item and lot are identical.
Duplicate record found. Unable to consume.	More than one record or duplicate records are available for the same lot in the Production Unit. You cannot	Ensure that there are no duplicate records in the selected lot.

Informational Message Name	Message Condition	Corrective Actions
	consume a BOM item from a lot with duplicate records in an operation.	
Unit of measure of the serial/lot does not match unit of measure for required quantity.	The unit of measure (UOM) of the BOM item and the lot is different.	Ensure that the UOM of the BOM item and the lot is same.

6. In the **QTY TO CONSUME** box, enter the quantity of consumption of the BOM item.
   - If each BOM item has a separate lot number, enter the lot number of each BOM item in the **SERIAL/LOT#** box, and then enter 1 in the **QTY TO CONSUME** box. For example, suppose you have been assigned the motor assembling operation. For the endshields BOM item, since the required quantity is two, you must enter the lot numbers of the two endshields used in the motor. In this case, in the **QTY TO CONSUME** box, enter the value 1 for each wheel.
   - If the BOM items have a combined lot number, enter the lot number, and then enter the number of BOM items consumed in the **QTY TO CONSUME** box. For example, suppose you have been assigned the motor assembling operation for a motor. If the operation requires four nuts and bolts, enter the lot number for the nuts and bolts BOM item, and then enter 4 in the **QTY TO CONSUME** box.

   Note: If the lot number that you have entered does not exist in Plant Applications, a window appears, asking you whether you want to create the lot number. If that happens, enter the quantity to create and consume, and then select **Yes**.
7. Select **Consume**.
   The details of the BOM item consumption are saved, and appear in the **Consumed History** section.

   Tip: You can navigate to the next BOM item by selecting the corresponding link. Or, you can skip to any BOM item by entering the serial number of the BOM item or scanning the bar code of the BOM item.
8. Repeat steps 3 through 6 for each serial number on which you have performed the operation.

Next Steps

Provide data for quality variables for each serial number in the operation.

Provide Data for Quality Variables

About This Task

Quality variables include details about the data that you must collect while performing an operation. These variables are defined in Plant Applications Administrator. The values that you provide for these variables help verify that the parameters that are critical to the quality and manufacturing processes are within the acceptable limits. You can use this data to review the performance of a production line and production unit and compare the quality of the products produced in each unit with projections for an operation.

For example, suppose you have been assigned the testing operation in a motor manufacturing unit. Quality variables can include the torque and rpm of the motor shaft. When you test each motor, you must enter the torque and rpm values for the corresponding serial number. A quality supervisor can then verify that the torque and rpm fall within the acceptable range.

You can provide data for quality variables only for serial numbers that are in progress.

Before You begin

Clock on the serial numbers for which you want to provide data for quality variables.

Procedure

1. In the **Work Queue** page, select the operation for which you want to provide data for the quality variables.
2. Select **Quality**.
   A list of serial numbers in the operation appear in the left section.
3. Select the serial number whose data you want to provide.
   A list of quality variables defined for the operation appear in the workspace.

   Tip:

   - By default, only the mandatory quality variables appear. If you want to access all the quality variables, switch the **Dynamic Rows** toggle.
   - If you want to view the lowest, highest, lower quartile, upper quartile, and median values for each variable, select  . If you want to view the same values plotted on a chart, select  .
   - If you want to add a comment, select  .
4. For each variable, enter data in the **SPEC** column.

   Tip: If you want to plot the value on a chart, select  .

   If acceptable limits have been specified for the variable, the box in the **SPEC** column displays a color, indicating whether the value that you have entered is within the acceptable range.
5. Repeat steps 3 and 4 for each serial number in the operation.

Results

The data for the quality variables is saved.

Next Steps

If a part contains a defect, create a defect. Otherwise, mark the operation complete for the serial number.

Create a Defect

About This Task

If a job is defective, you must create a defect for the serial number. A quality supervisor uses this data to inspect the job, and dispose it using NCR Management.

The following conditions apply when you create a defect:

- You can create a defect only for serial numbers that are clocked on.
- You can create a defect for serial numbers that are clocked on by you.
- You can create a defect for multiple serial numbers at the same time.

Procedure

1. In the **Work Queue** page, select the operation for which you want to create a defect.
2. Select **NCR**.
   In the left section, a list of serial numbers in the operation appears. In the workspace, a list of defects that have been created for the first serial number in the list appears.
3. Select **Create Non Conformance**.

   Note: The **Create Non Conformance** button does not appear for completed serial numbers.

The **Select Serial/Lot** window appears, displaying the serial numbers in the operation that are in progress.

4. If you want to create a defect for all the serial numbers in the operation, select the check box in the heading row of the table.
5. If you want to create a defect for selected serial numbers, perform one of the following steps:
   - Select the check box for each serial number for which you want to create a defect.
   - Search for a serial number by entering a value in the **Search** box, and then select the check boxes from the filtered list that appears.
6. Select **Next**.
   The **Summary** section appears.
7. Provide values as specified in the following table.

Box	Description
SUMMARY	Enter a summary for the defect. A value is required in this field.
NON CONFORMANCE TYPE	This field is disabled and populated with the value **ManufacturingDefect**.
DEFECT TYPE	Select the defect type. A value is required in this field.
DEFECT REASON	Select **Select Reason**, and then provide values for each level of reasons for the defect. This helps identify the root cause of the defect.
FULL DESCRIPTION	Enter a description for the defect that does not exceed 1000 characters.

8. Select **Submit**.

Results

- A defect is created.
- The status of the selected serial numbers changes to On Hold (indicated by ).
- In the **ON HOLD** column in the **Work Queue** page, the value is updated for the corresponding operation, and appears as a link. When you select the link, a list of the serial numbers in the operation for which you created a defect appears.
- The defect appears in the NCR Management application for a quality supervisor to dispose the defective job.

Next Steps

After you finish working on all the serial numbers assigned to you for the operation, mark the operation complete.

Note: If a defect has been created for a serial number in the operation, you can mark the operation complete only after the defect has been disposed.

Mark an Operation Complete

About This Task

After you perform an operation on a part, you must mark the operation complete for the corresponding serial number.

After all the serial numbers for the operation are marked complete, the operation is marked complete. It is then removed from the list in the **Work Queue** page. After all the operations for a work order are

marked complete, the work order is marked complete in Plant Applications. You can view the completion status of the work order in Order Management.

The following conditions apply when you mark a serial number complete:

- You can mark a serial number complete only if you have specified the BOM consumption for all the mandatory BOM items for the operation. The quantity of the consumed BOM items must be greater than or equal to the required quantity to perform the operation.
- You can mark a serial number complete only if you have provided data for all the mandatory quality variables for the operation.
- You can mark a serial number complete only if it is clocked on by you.
- You can mark multiple serial numbers complete at the same time.

Before You begin

- Specify BOM consumption for all the required BOM items for all the serial numbers that you want to mark complete.
- Provide data for quality variables for all the serial numbers that you want to mark complete.

Procedure

1. In the **Work Queue** page, in the column containing the operation that you want to mark complete, select  .

   Note: The  button appears only if there is at least one serial number that you can mark complete.

   The **Select Serial number(s) to complete** window appears, displaying a list of serial numbers that you can mark complete.
2. If you want to mark all the serial numbers complete, select the check box in the heading row of the table.
3. If you want to mark selected serial numbers complete, perform one of the following steps:
   - Select the check box next to each serial number that you want to mark complete.
   - Search for a serial number by entering a value in the **Search in clocked on serial numbers** box, and then select the check boxes from the filtered list that appears.
4. Select **Complete**.

Results

- The selected serial numbers are marked complete.
- The value in the **COMPLETED** column for the operation is updated.
- If all the serial numbers in the operation are marked complete, the operation no longer appears in the **Queue** page. It appears in the By Work Order page until all the operations in the work order are complete.

Clocking Off a Serial Number

About Clocking Off a Serial Number

If you want to stop working on a serial number for some time, you can clock off the serial number, and then clock on again when you resume working on it. It provides visibility to the supervisor on the progress of work for an operation.

The following conditions apply when you clock off a serial number:

- You can clock off only the serial numbers that you have clocked on.
- You can clock off multiple serial numbers in an operation at the same time.

Clock Off a Serial Number

Procedure

1. In the **Work Queue** page, in the row containing the operation on which you want to stop working, select the **OFF** button.

   Note: The **OFF** button is enabled only if you have clocked on at least one serial number in the operation.

   The **Select Serial number(s) to clock off** window appears, displaying a list of serial numbers in the operation that you have clocked on.
2. If you want to clock off all the available serial numbers, select the check box in the heading column of the table.
3. If you want to clock off selected serial numbers, perform one of the following steps:
   - Select the check box for each serial number that you want to clock off.
   - Search for a serial number by entering the value in the **Search in available serial numbers** box, and then select the check boxes from the filtered list that appears.
   - Scan the bar code of the serial number by selecting  .
4. Select **Clock off**.

Results

The selected serial numbers are clocked off. In the **Work Queue** page, the number of serial numbers that are clocked on is updated in the **OFF/ON** column.

Removing Operations from the Work Queue

About Removing Operations from the Work Queue

If you no longer want to work on operations in the work queue, you can remove them from the work queue.

You can only remove the operations that you have added manually to the work queue. If you attempt to remove an operation that has been assigned to you or clocked on by you, the operation appears again when you refresh the page.

Remove Operations from the Work Queue

Procedure

In the **Work Queue** page, in the row containing the operation that you want to remove, select  . The operation is removed from the work queue.

Tip: To remove all the operations in the work queue that you have manually added, in the upper-right corner of the page, select  .

Chapter 7

Property Definition

Topics:

About the Property Definition Application

Overview

As a supervisor, you can access the Property Definition application to manage custom properties tailored to the requirements of your business. For example, you can define properties to capture additional business data related to ERP inbound messages.

Using this application, you can:

- Access the existing property definitions.
- Create a property definition.
- Link properties to a group.

After you define the properties in the Property Definition application, the same properties are configured in the other applications such as ERP, Route Management, and NCR Management for you to use them.

About Property Definitions

Properties are custom fields defined to capture the business data that the standard properties cannot. Each property is associated with a group, and, in turn, each group is mapped to a category.

Note: Both property groups and categories are defined in the Plant Applications database.

A property definition contains the following components:

- **Property Category:** A property category is a parent object that denotes the area of application to which the property group belongs. You can use it to organize the property groups and definitions associated with the application.
- **Property Group:** A property group is a collection of properties. You can use it to group fields that are commonly used so that the individual fields are automatically added in the configured applications. You can also use it to read from or write to the properties of the application. A property group does not contain links to actual property definitions; it only contains property names stored as strings unless the properties are used in the applications.
- **Property Definition:** A property definition denotes a field or variable name that you want to add in addition to the standard properties in the application.

Property definitions in the ERP and NCR Management applications

The following table contains an example of the properties defined in the ERP and NCR Management applications.

Category	Group	Property
ERP	Material Download	• Material Name • Is Serialized • Code • Storage
NCR Management	Disposition	• Comment • Features • Report

Creating a Property Definition

About Creating a Property Definition

As a supervisor, you can create a custom property for an application if it contains data that does not match any of the standard properties. Each property is associated with a group, and, in turn, each group is mapped to a category.

Using the Property Definition application, in addition to creating a property, you can copy, modify, and delete a property.

Create a Property Definition

Before You begin

- Based on the type of the property definition field, you must select the data type in the **DATA TYPES** box. For example, use the string data type for text and the integer data type for a whole number.
- Ensure that a group is assigned to a category in the Plant Applications database.

Procedure

1. Select .
   The **Property Definition** page appears, displaying a list of properties available in the Plant Applications Universal Client.
2. Enter the values as specified in the following table.

Box	Description
PROPERTY NAME	Denotes the name for the property. You must enter a value that is unique to a group.
ALIAS NAME	Enter an alias for the property.
DATA TYPES	Select a data type for the property. **Note:** A data type defines the format in which the data is stored and displayed in the application.
DEFAULT VALUE	Enter a default value for the property based on the data type.
REQUIRED VALUE	Select this check box only if you want the property to be a required value.
PROPERTY GROUP	This drop-down list box contains a list of groups defined in the Plant Applications database. You must select the group to which you want to assign the property.
UOM	This box contains a list of UOMs defined in the Plant Applications database. Select a unit of measurement (UOM) for the property.

3. Select **Save**.
   A property definition is created. This property definition is integrated with the Route Management application.

   Note: To modify the property definition details, select **Edit**. To create another property definition with the details of the current property definition, select **Copy**.

Next Steps

Assign a property group to a route in the Route Management application, and then provide values for the property definition.

Chapter 8

Security Management

Topics:

About the Security Management Application

Overview

As an Administrator, you can use the Security Management application to provide access privileges to the users and assign them to various applications in the Plant Applications Universal Client. For example, users assigned to the Operations privilege set can work with the Operations module.

Using this application, you can:

- Add a group to the privilege set.
- Remove a group from the privilege set.

About Privilege Sets

A privilege set or scope specifies the access for users to the applications in the Plant Applications Universal Client. For each privilege set, a UAA group is created. Using Security Management, you must add your UAA groups to the privilege set. The members of the group will then get access to the associated application in Plant Applications Universal Client.

A privilege set contains the following components:

- **Privilege Set:** A parent object which denotes a specific application in the Plant Applications Universal Client. You can use it to add groups to a privilege set. The members of the group will then get access to the associated application in Plant Applications Universal Client.
- **Group:** A collection of users and groups. Using Security Management, you can create groups in UAA, and add or remove groups defined in UAA to a privilege set.

> **User allocation in the Security Management application**
>
> Suppose a user, TherouC, is assigned to two groups, a_PPC_EPI_PA_SIS_AUG_SAPDeliv and a_PPC_EPI_PA_SIS_AUG_SAPPrOrd, in an identity provider application. If a_PPC_EPI_PA_SIS_AUG_SAPDeliv is added to the NCM Management privilege set and a_PPC_EPI_PA_SIS_AUG_SAPPrOrd is added to the Route Management privilege set, TherouC will have access to both NCM Management and Route Management applications.

Adding a Group to the Privilege Set

About Adding a Group to the Privilege Set

As an Administrator, you can add a group to the privilege set to manage privilege access for multiple users conveniently and easily. When a group is added to a privilege set, all the users associated with the group can access the application associated with the privilege set.

Add a Group

Procedure

1. Select **Security Management**.
   The **Privilege Sets** page appears, displaying a list of privilege sets.

2. Select a privilege set.
   The **Privilege Details** page appears, displaying a list of groups associated with the selected privilege set.
3. Select **Add Group**.
   The **GROUP NAME** window appears.
4. In the **Enter a Group Name** box, specify a group name that you want to add to the privilege set, and then select **Add**.

   Tip: When you enter three or more characters, a list of group names that contain the characters appear. If the group does not exist, you can enter the full name of the group to create a new one in UAA. To add users to this group or edit the group membership, refer to the UAA documentation.

Results

The group is added to the privilege set. The users associated with the group in the identity provider application are added to this privilege set.

Removing a Group from the Privilege Set

About Removing a Group from the Privilege Set

As an Administrator, you can remove a group from the privilege set if you no longer need it. The following conditions apply when you remove a group in the Security Management application:

- The users associated with the group are no longer members of the privilege set. Therefore, they can no longer access the application associated with the privilege set.
- The groups and the users in the respective Identity Provider applications are not deleted.
- The group is not deleted in User Account and Authentication (UAA).

Remove a group

Procedure

1. To remove a group from the privilege set, select ✕ in the row containing the group.
   A message appears, asking you to confirm that you want to remove the group.
2. Select **Delete**.

Results

The group is removed from the privilege set.

Chapter 9

Downtime Displays

Topics:

Use the Downtime Displays app to access the downtime overview and downtime events list for the equipment assigned to you. You can also view the list of KPIs and add non-productive time events and downtime events for the machines assigned to you. Learn more...

About Downtime Displays

As an operator, you can use the Downtime Displays application in the Plant Applications Universal Client enables you to access the downtime overview and downtime events list for the equipment assigned to you.

You can access the following pages in the Downtime Displays application:

- **Events**: A list of downtime events and their statuses corresponding to the equipment selected in the **My Machines** page appears. Only the machines that you as an operator can access appear in this page. In this page, you can perform the following actions:
  - Add a downtime event
  - Add a non-productive time (NPT) event
  - Modify existing downtime events
  - Split events
  - Merge events

  As a supervisor, you can use the Downtime Displays application to perform the following actions.
  - Access KPIs
  - Access downtime events
  - Add a downtime event
  - Add a non-productive time (NPT) event
  - Modify existing downtime events
  - Split events
  - Merge events
  - Delete events
- **KPIs**: An overview of key performance indicators (KPIs) such as overall equipment effectiveness (OEE), availability, mean time between failures (MTBF), and mean time to repair (MTTR) appears for all the equipment that you as an operator can access. The line charts for downtime breakdown and downtime by category also appear in this page.

  Note: If no data is available for a KPI or chart, a message indicating the non-availability of data for the corresponding KPI or chart appears in the **KPIs** page.

About Non-Productive Time in Downtime Calculations

When accessing the KPIs in Downtime Displays, Equipment, and Reports, you can include or exclude non-productive time (NPT) in the downtime calculation of KPIs.

The following sections describe various scenarios of downtime calculations.

Scenario 1: Downtime Duration is Within NPT Duration

The following table describes the scenario when the NPT event starts before the start time of the downtime event and ends after the end time of the downtime event. The table further includes the downtime calculation in this scenario.

Time Entry Type	Start Time (mm/dd/yy hh:mm)	End Time (mm/dd/yy hh:mm)	Duration (mins)	Downtime Calculation (mins)	
				Include NPT	Exclude NPT
Downtime	5/10/18 5:08	5/10/18 5:10	2	0	2
NPT	5/10/18 5:05	5/10/18 5:15	10		

The downtime duration is calculated as follows:

- When NPT is included: The downtime duration is ignored by the application. In this scenario, the downtime duration appears as 0 mins.
- When NPT is excluded: The actual downtime duration appears. In this scenario, the downtime duration appears as 2 mins.

Scenario 2: Downtime Starts Before NPT Starts and Ends Before NPT Ends

The following table describes the scenario when the downtime event starts after the start time of the NPT event and ends before the end time of the NPT event. The table further includes the downtime calculation in this scenario.

Time Entry Type	Start Time (mm/dd/yy hh:mm)	End Time (mm/dd/yy hh:mm)	Duration (mins)	Downtime Calculation (mins)	
				Include NPT	Exclude NPT
Downtime	5/10/18 5:17	5/10/18 5:25	8	3	8
NPT	5/10/18 5:20	5/10/18 5:30	10		

The downtime is calculated as follows:

- When NPT is included: Only the downtime duration before the NPT event starts appears as the downtime duration. In this scenario, the downtime duration appears as 3 mins.
- When NPT is excluded: The actual downtime duration appears. In this scenario, the downtime duration appears as 8 mins.

Scenario 3: Downtime Starts and Ends After NPT Starts and Ends

The following table describes the scenario when the downtime event starts after the start time of the NPT event and ends after the end time of the NPT event. The table further includes the downtime calculation in this scenario.

Time Entry Type	Start Time (mm/dd/yy hh:mm)	End Time (mm/dd/yy hh:mm)	Duration (mins)	Downtime Calculation (mins)	
				Include NPT	Exclude NPT
Downtime	5/10/18 5:47	5/10/18 5:52	5	2	5
NPT	5/10/18 5:40	5/10/18 5:50	10		

The downtime is calculated as follows:

- When NPT is included: Only the downtime duration after the NPT event ends appears as the downtime duration. In this scenario, the downtime duration appears as 2 mins.
- When NPT is excluded: The actual downtime duration appears. In this scenario, the downtime duration appears as 5 mins.

Scenario 4: Downtime Starts Before NPT Starts and Ends After NPT Ends

The following table describes the scenario when the downtime event starts before the start time of the NPT event and ends after the end time of the NPT event. The table further includes the downtime calculation in this scenario.

Time Entry Type	Start Time (mm/dd/yy hh:mm)	End Time (mm/dd/yy hh:mm)	Duration (mins)	Downtime Calculation (mins)	
				Include NPT	Exclude NPT
Downtime	5/10/18 5:34	5/10/18 5:41	7	2	7
NPT	5/10/18 5:35	5/10/18 5:40	5		

The downtime is calculated as follows:

- When NPT is included: The sum of downtime durations before the NPT event starts and after the NPT event ends appears as the downtime duration. In this scenario, the downtime duration appears as 2 mins.
- When NPT is excluded: The actual downtime duration appears. In this scenario, the downtime duration appears as 7 mins.

Access KPIs

About This Task

The Downtime Displays application enables you to access key performance indicators (KPIs) and a summary of downtime events for the equipment assigned to you. In the **KPIs** page, you can review the overall equipment effectiveness (OEE), availability, mean time between failures (MTBF), and mean time to repair (MTTR) values. You can use the charts for Downtime Breakdown and Downtime by Category to review the durations of different downtime events and their reasons.

Procedure

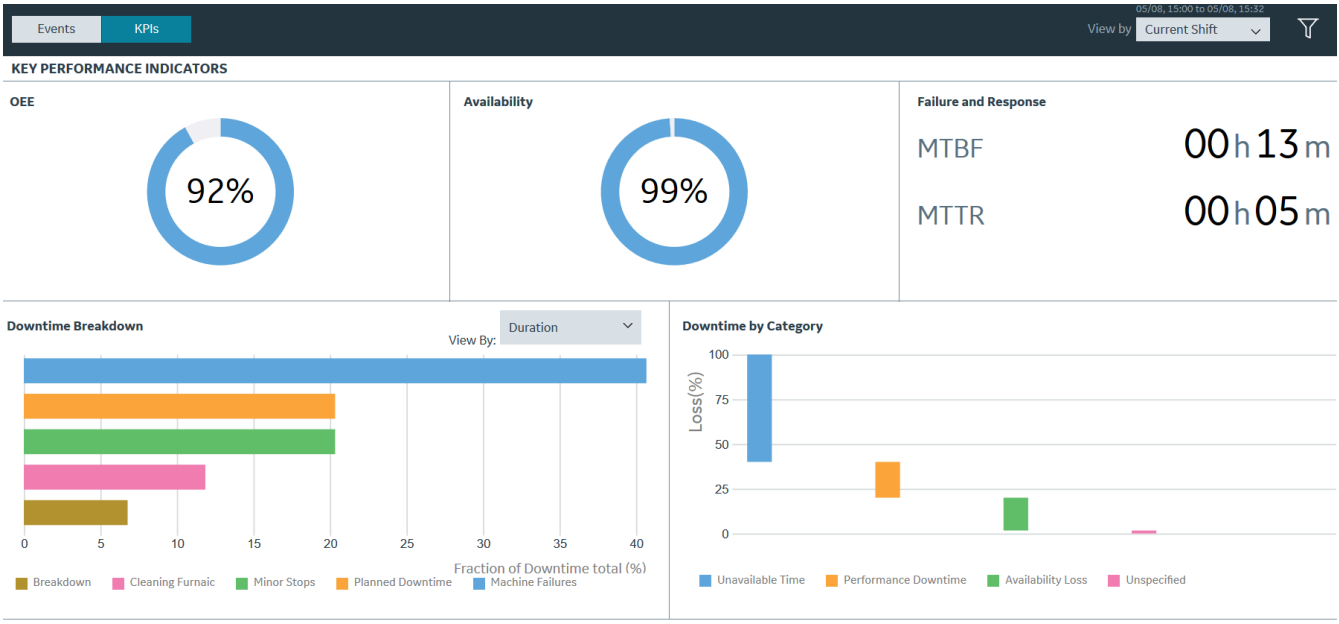
1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Events** page appears.
3. Select the **KPIs** tab.

   The Donut chart appears in the dashboard summarizing the OEE and availability of the equipment. Each KPI shows the following status information.

Status	Colors	Range
Good	Blue	> 85 percent
Moderate	Yellow	> 50 percent and <= 85 percent
Low	Red	<= 50 percent

   Note: The maximum value for the KPIs are set to 100% by default. However, you can override this by setting **OEE Max Limit Override** to true. The OEE Max Limit Override flag allows the OEE cap beyond 100%. When this flag is set to false and the KPI actual value is more than 100%, the value is defaulted to 100% in the chart.

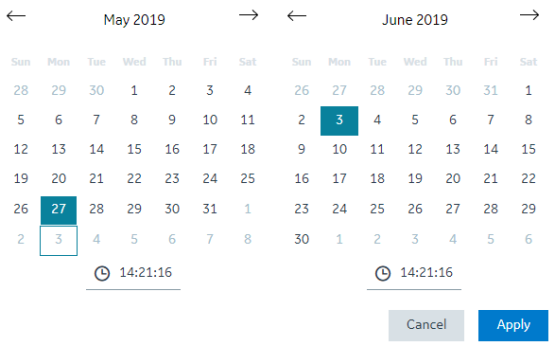
   The time duration for MTBF and MTTR values appears in hours and minutes.



Note: These KPI metrics are based on the **OEE Aggregation Store** setting. If **OEE Aggregation Store** is set to False, the values are calculated on the fly every time the chart is opened or refreshed. If it is set to True, the values are populated from the OEE Aggregation tables. For more information, refer to the OEE Aggregation Store topic.

4. In the drop-down list box containing the time range options, select a time range as described in the following table.

Time Range	Description
Previous Day	Select to access all KPIs from the day prior to the current Production Day.
Current Day	Select to access all KPIs from the start time of the current Production Day until the current time. If there are no shifts configured for the plant, this option is selected by default.
Current Shift	Select to access all KPIs from the start time of the ongoing shift until the current time. If shifts are configured for the plant, this option is selected by default.
Previous Shift	Select to access all KPIs from the shift prior to the current shift.

Time Range	Description
Last 7 days	Select to access all KPIs within seven days prior to the current Production Day.
Custom	Select to access all KPIs within a date and time range that you specify by using a calendar window. The following calendar window appears when you select the **Custom** option.  To specify a custom date and time range in the calendar window: a. In the **START DATETIME** section, select a date and enter a time in the format hh:mm:ss. b. In the **END DATETIME** section, select a date and enter a time in the format hh:mm:ss. c. Select **Apply**.

5. **Optional:** Select  , then select the **NPT** check box, and then select **Apply** to include any non-productive time (NPT) in the results. For more information, refer to the About Non-Productive Time in Downtime Calculations on page 88 topic.
6. In the **Downtime Breakdown** section, in the **View By** box, select **Duration** or **Count** to access downtime events.

   You can access the loss percentage and reasons for the downtime events in the **Downtime by Category** chart.

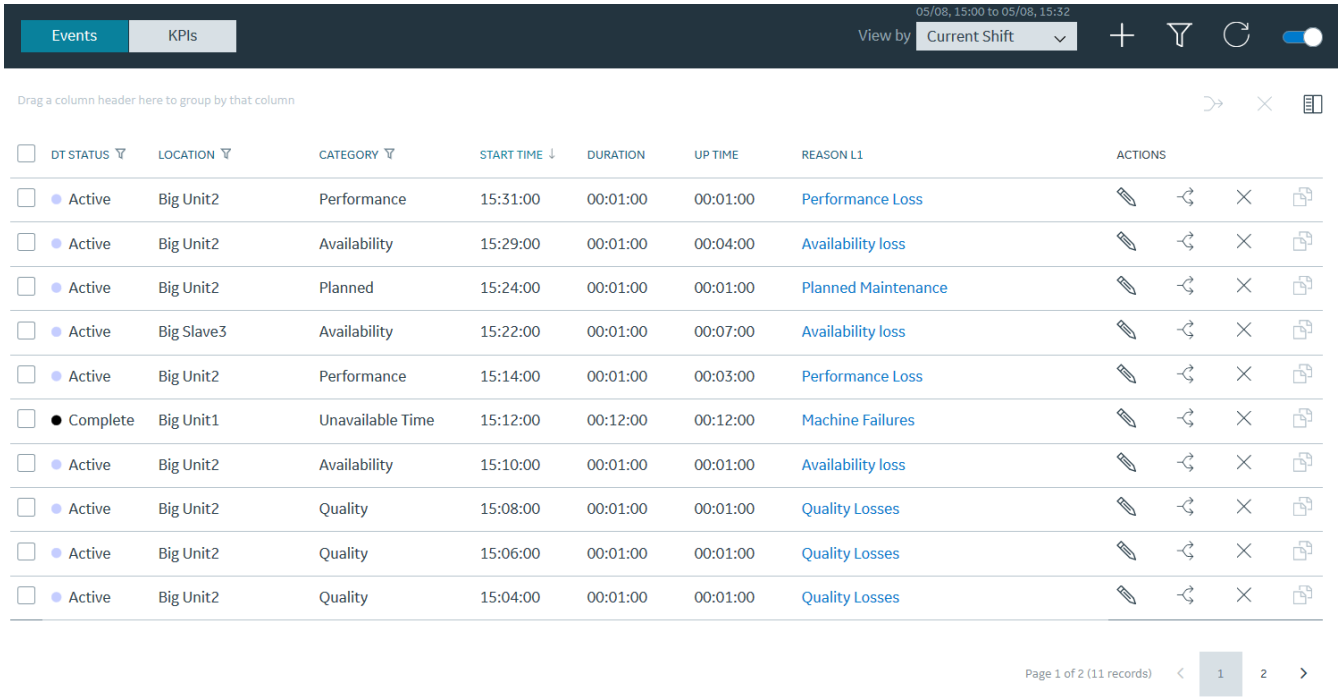
Access a Downtime Events List

About This Task

You can access the list of downtime events for the selected time range to review the status and details for the downtime events.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format. In the table displaying the list of downtime events and their details, you can resize a column or drag and drop a column to a new position. The column settings you select in the table are retained when you access the **Events** page later.



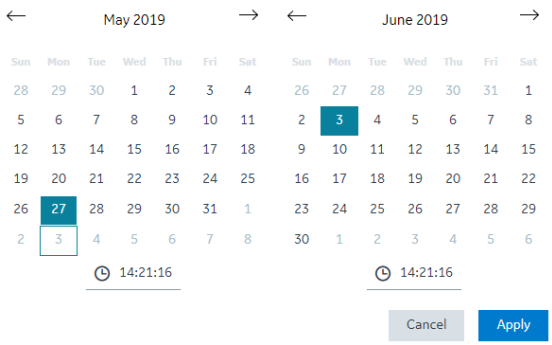
A summary of unplanned, planned, external, and NPT downtime events within a time range appears in the page. In addition, the following information appears in a tabular format for each downtime event.

Column	Description
DT Status	The downtime status for a downtime event along with the corresponding color. • **Green**: Active • **Blue**: Open • **Black**: Complete **Note:** The color scheme is based on the default color scheme setting in the Plant Applications Administrator.
Category	The downtime category for a downtime event.
Location	The location of an equipment experiencing downtime.
Start Time	The start time for the downtime event.
Duration	The downtime duration for the downtime event. **Note:** The value in this field is blank for open downtime events.
Reason	The downtime reason for the downtime event.
Actions	The actions that you can perform on a downtime event. You can select one of the following action items: • : Select to modify a downtime event. • : Select to split a downtime event. • : Select to delete a downtime event. • : Select to copy faults and reasons from a downtime event to the required selected downtime events.

Note: You can filter the downtime events based on filters applied to the selected columns. Select  appearing next to the column name and then select required filters from the menu to include in the list. You also can drag a column to the column header to group the downtime events based on the column selected.

Tip: The downtime events are listed in multiple pages. One page contains maximum of seven downtime events. If you access a different page in the downtime events list, you can select **TOP** to return to the first page.

3. In the drop-down list box containing the time range options, select a time range as described in the following table. The range that you select appears in the form of date and time interval next to the drop-down list box containing the time range options.

Time Range	Description
Previous Day	Select to access all downtime events from the day prior to the current Production Day.
Current Day	Select to access all downtime events from the start time of the current Production Day until the current time. If there are no shifts configured for the plant, this option is selected by default.
Current Shift	Select to access all downtime events from the start time of the ongoing shift until the current time. If shifts are configured for the plant, this option is selected by default.
Previous Shift	Select to access all downtime events from the shift prior to the current shift.
Last 7 days	Select to access all downtime events within seven days prior to the current Production Day.
Custom	Select to access all downtime events within a date and time range that you specify by using a calendar window. The following calendar window appears when you select the **Custom** option.  To specify a custom date and time range in the calendar window: a. In the **START DATETIME** section, select a date and enter a time in the format hh:mm:ss b. In the **END DATETIME** section, select a date and enter a time in the format hh:mm:ss c. Select **Apply**.

Note: The shift values for current and previous shifts are determined by the settings selected in the Plant Applications Department level. The time-interval that you select appears in the form of date and time next to the time-interval drop-down list box.

4. **Optional:** Select a downtime event to access the **Quick Edit** page and perform the following tasks:
   a) In the **FAULT CODE** section, select the box for the Fault Code, and then select a Fault Code associated with the downtime event.

      Tip: Alternatively, within the **FAULT CODE** section, you can enter the text to search for and select a Fault Code.
   b) In the **REASONS** section, select **Top <number>** to access the **Top <number> Reasons** menu, and then select a reason associated with the Fault Code.

      The <number> represents a numeric value ranging from 0 to 5, indicating the top downtime reasons most frequently selected by the operator. You can configure reasons in the Plant Applications Administrator.

      Note: The values that appear in the **L1**, **L2**, **L3**, and **L4** boxes for the levels of reasons are configured in the Plant Applications Administrator and are automatically populated, if available, based on the reason you select in the **Top <number> Reasons** menu.
   c) In the **ADD COMMENTS** section, select **Click to add/edit comment**.
   The **Comment** window appears.
   d) In the **ADD COMMENT** box, enter a comment for the changes you made, and select **Add Comment**.
   e) Select **Save** to apply your changes.
5. **Optional:** In the table displaying the list of downtime events and their details, select an option to perform an action as described in the following table.

Option	Description
	Select to filter the downtime events based on the specified duration. You can also select the **NPT** check box, and then select **Apply** to include any non-productive time (NPT) in the results.
	Select to update the downtime events list with the latest information available for your equipment. **Note:** This icon is enabled only when there are updates to the downtime events list. Else, one of the following icon appears: •  Indicates that there are no updates to the downtime events list. •  Indicates that the RabbitMQ service is down.
	Select either to add a downtime event or add a non-productive time (NPT) downtime event.
	Select to merge downtime events for the equipment from the same location. **Note:** This icon is enabled only when you select for more than one downtime event in the table.

Option	Description
	Select to delete multiple downtime events. **Note:** This icon is enabled only when you select for more than one downtime event in the table.
	Select to add or remove columns from the table displaying the downtime events list. The added columns are retrieved when you access the **Events** page later. By default, the following columns appear in the specified order when you access the **Events** page: a. DT STATUS b. CATEGORY c. LOCATION d. START TIME e. DURATION f. REASON g. PRODUCT **Tip:** You can use the horizontal scroll bar in the table to drag the scroll box and access the data from all the added columns.
	Select to automatically update the downtime events based on the selected time duration. You can disable this, if you do not want to update only the newly added downtime events.

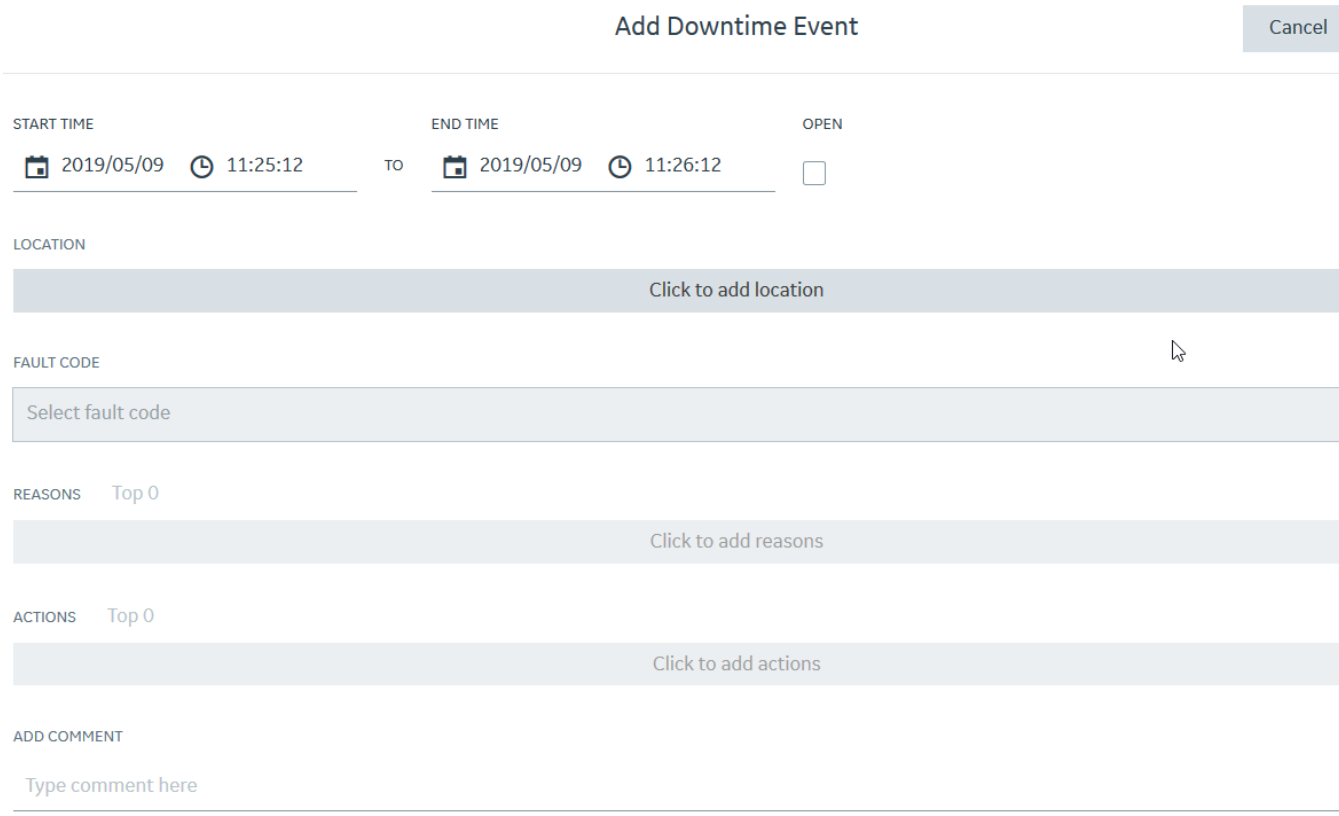
Add a Downtime Event

About This Task

You can add a downtime event for the equipment that you are authorized to access.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format.
3. In the **Events** page, select  and then select **Add Downtime Event** from the menu to add a downtime event.
   The **Add Downtime Event** page appears.



4. In the **START TIME** and **END TIME** box, enter a duration for the downtime event.
5. In the **LOCATION** section, select **Click to add location**. The Select location windows appears. Select a department, line, and machine in the **DEPARTMENT**, **LINE**, and **MACHINE** sections, respectively, where you plan to add the downtime event. Select **Apply**.

   Tip: Alternatively, within the **DEPARTMENT**, **LINE**, and **MACHINE** sections, in the search box displaying , you can enter the text to search for and select the required item.
6. In the **FAULT CODE** box, select a Fault Code to describe the downtime event.

   Tip: Alternatively, within the **FAULT CODE** box, enter the text to search for and select a Fault Code.
7. In the **REASONS** section, select **Top <number>** to access the **Top <number> Reasons** menu, and then select a reason associated with the Fault Code.

   The <number> represents a numeric value ranging from 0 to 5, indicating the top downtime reasons most frequently selected by the operator. You can configure reasons in the Plant Applications Administrator.

   Note: The values that appear in the **L1**, **L2**, **L3**, and **L4** boxes for the levels of reasons are configured in the Plant Applications Administrator and are automatically populated, if available, based on the reason you select in the **Top <number> Reasons** menu.
8. In the **ACTIONS** section, select **Top <number>** to access the **Top <number> Actions** menu, and then select an action taken by the operator for the downtime event.

   The <number> represents a numeric value ranging from 0 to 5, indicating the top actions most frequently performed by the operator. You can configure actions in the Plant Applications Administrator.

Note: The values that appear in the **L1**, **L2**, **L3**, and **L4** boxes for the levels of actions are configured in the Plant Applications Administrator and are automatically populated, if available, based on the action you select in the **Top <number> Actions** menu.

9. **Optional:** In the **ADD COMMENT** box, enter a comment for the downtime event.
10. Select **Save** to add the downtime event for the selected machine.

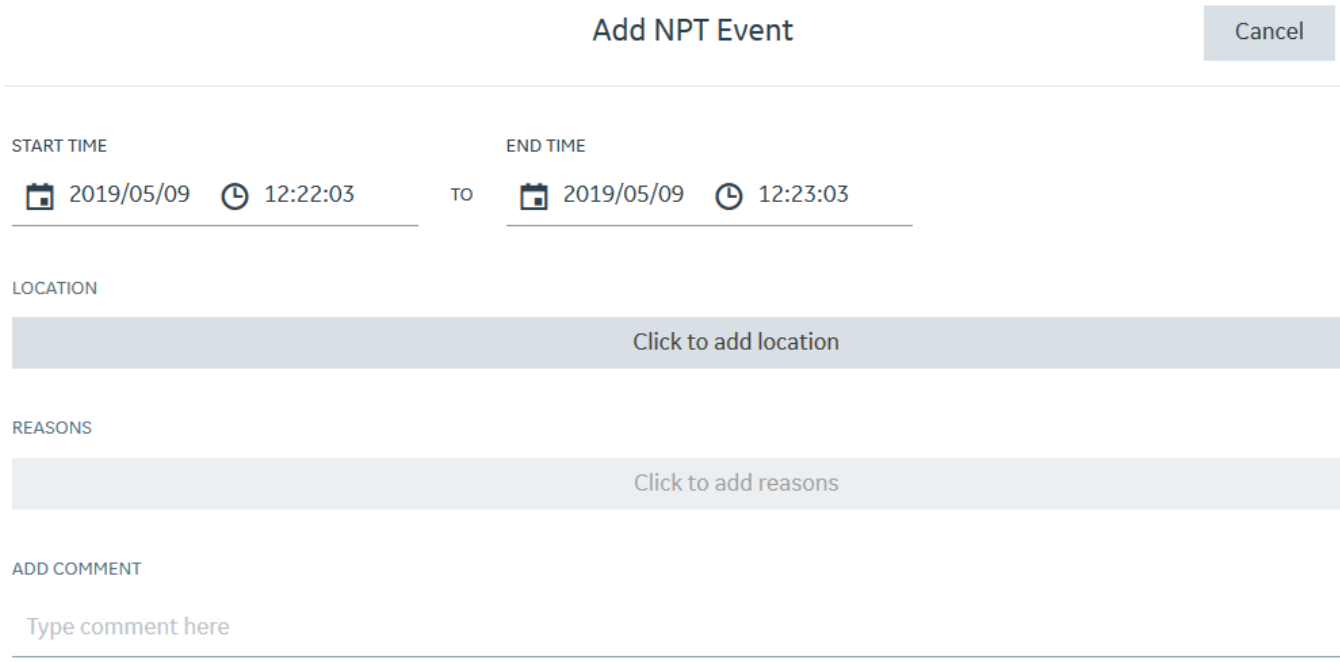
Results

The newly added downtime event appears in the table displaying the list of downtime events and their details in the **Events** page.

Add an NPT Downtime Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format.
3. In the **Events** page, select and then select **Add NPT** to add a non-productive time (NPT) downtime event.
   The **Add NPT Event** page appears.



4. In the **START TIME** and **END TIME** box, enter a duration for the NPT downtime event.
5. In the **LOCATION** section, select **Click to add location**. The **Select location** window appears. Select a department, line, and machine in the **DEPARTMENT**, **LINE**, and **MACHINE** sections, respectively, where you plan to add the NPT downtime event. Select **Apply**.

   Tip: Alternatively, within the **DEPARTMENT**, **LINE**, and **MACHINE** boxes, in the search box displaying , you can enter the text to search for and select the required item.

6. In the **REASONS** section, select **Click to add reasons**. The **Select Reasons** window appears. Select the levels of reasons from the available reasons and then select **Apply**.

   Note: The **Click to add reasons** is enabled only when you configure the reasons for the selected machines in the Plant Applications Administrator.
7. **Optional:** In the **ADD COMMENT** section, in the box for the comment, enter a comment for the event.
8. Select **Save** to add the NPT downtime event in the downtime events list.

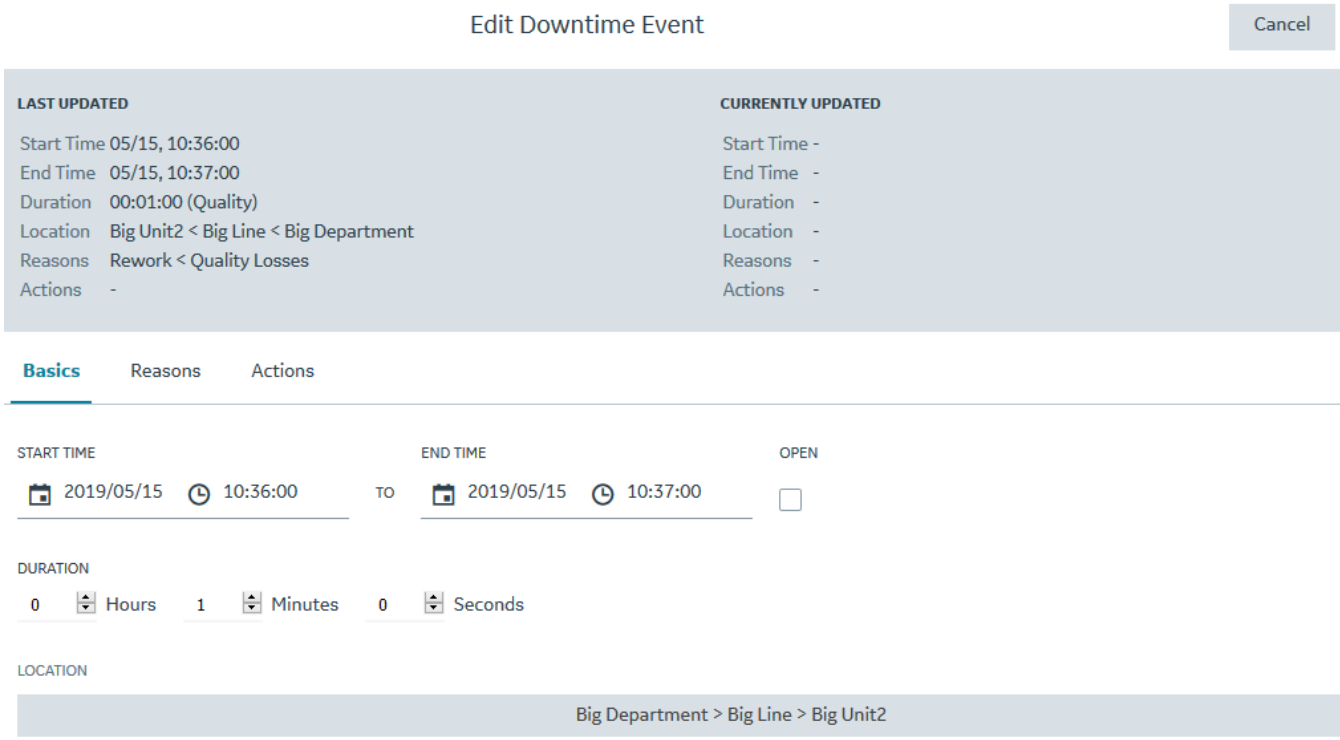
Results

The newly added NPT downtime event appears in the table displaying the list of downtime events and their details in the **Events** page.

Modify Downtime Events

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Events** page appears.
3. Access the required downtime events list.
4. In the row containing the downtime event whose detail you want to modify, select .
   The **Edit Downtime Event** page displaying the **Basics** section appears.



5. In the **Basics** section, modify the duration, status, and machine for the downtime event.
   a) Enter a date and time in the **Start time** and **End time** boxes to update the duration of the downtime event.

Note: The **End time** box is enabled only when the **Open** check box is cleared.

b) Select the **Open** check box to mark the event status as open.

c) In the **LOCATION** section, select an existing location. The **Select location** window appears. In the **Machine** section, select a machine to modify the machine selected initially for the downtime event and then select **Apply**.

Tip: The modified downtime event details appear in the **CURRENTLY UPDATED** section.

6. Select the **Reasons** tab, and then modify the Fault Code and reasons for the downtime event.

   a) In the **FAULT CODE** section, select the required Fault Code.

   Tip: Alternatively, within the **FAULT CODE** section, enter the text to search for and select a Fault Code.

   b) In the **REASONS** section, select reasons corresponding to the Fault Code for the downtime event.

   Note: Select **Top <number>** to access the **Top <number> Reasons** menu, and then modify the action taken by the operator for the downtime event. The <number> represents a numeric value ranging from 0 to 5, indicating the top downtime reasons most frequently selected by the operator. You can configure reasons in the Plant Applications Administrator.

   The values that appear in the **L1**, **L2**, **L3**, and **L4** boxes for the levels of reasons are configured in the Plant Applications Administrator and are automatically populated, if available, based on the reason you select in the **Top <number> Reasons** menu.

   c) In the **ADD/EDIT COMMENTS** section, select **Click to add/edit comment**. The Comment window appears. In the **ADD COMMENT** box, enter a comment or modify the comment for the changes you made and select **Add Comment**

7. Select the **Actions** tab, and then, in the **ACTIONS** section, modify the level of reasons for an event.

   Note: Select **Top <number>** to access the **Top <number> Actions** menu, and then modify the action taken by the operator for the downtime event. The <number> represents a numeric value ranging from 0 to 5, indicating the top actions most frequently performed by the operator. You can configure actions in the Plant Applications Administrator.

   The values that appear in the **L1**, **L2**, **L3**, and **L4** boxes for the levels of actions are configured in the Plant Applications Administrator and are automatically populated, if available, based on the action you select in the **Top <number> Actions** menu.

   a) In the **ADD/EDIT COMMENTS** section, select **Click to add/edit comment**. The **Comment** window appears. In the **ADD COMMENT** box, enter a comment or modify the comment for the changes you made and select **Add Comment**

8. **Optional:** Select the **NPT** tab, and then modify the event details for an NPT.

   a) In the **End Time** box, modify the duration for the non-productive time (NPT) downtime event.

   b) In the **ADD/EDIT COMMENTS** section, select **Click to add/edit comment**. The Comment window appears. In the **ADD COMMENT** box, enter a comment or modify the comments entered for the NPT downtime event and select **Add Comment**.

   Note: The **NPT** section appears based on the selected Fault Code and downtime reasons.

9. Select **Save** to save the modified details of the downtime event.

Results

The modified details appear for the downtime event.

Copy Faults and Reasons to the Selected Downtime Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format.
3. Access the required downtime events list.
4. In the table displaying the list of downtime events and their details, select for the target downtime events from which you want to copy the faults and reasons.

   Note: The selected downtime events must be associated with the equipment from the same location.

   The action for the deselected rows is enabled.
5. Select for the source downtime event row from which you want to copy the faults and reasons.
6. Select **OK** to confirm that you want to copy the faults and reasons for the selected downtime events.

Results

The target downtime events now have the same faults and reasons as the source downtime event.

Split a Downtime Event

About This Task

You can split an existing downtime event into multiple downtime events of equal or customized duration so that you can accommodate correct reasons to downtime events that happened during the overall downtime duration.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format.
3. Access the required downtime events list.
4. Select corresponding to a downtime event to split the downtime event.
   The **Split** page appears.
5. In the **Split** page, enter the number of target downtime events and the option to split the duration.
   a) In the **SPLIT DURATIONS** section, select one of the following options:
      - **Equally**: The total duration of the selected source downtime event is equally divided into the duration of target downtime events.

        Note: If you select this option, you cannot modify the duration for downtime events later.
      - **Manually**: The total duration of the selected source downtime event is manually divided into the duration of new target downtime events.

   b) In the **Number of Events** box, select a value corresponding to the downtime events into which you want to split the selected downtime event. Select **Next**.

Note: You can split a downtime event into a minimum of two and a maximum of six further equal or customized duration downtime events.

The **Split Event** page appears.

6. In the **Split Event** page, enter the duration and downtime reason.
   a) In the **Duration** column for a downtime event, enter a valid duration in the boxes corresponding to the time format hh:mm:ss.

      Note: You can enter a duration for target downtime events only when you selected the option to manually enter the duration.
   b) In the **Quick Pick** column for a downtime event, you can select **Top <number>** to access the **Top <number> Reasons** menu, and then select a reason associated with a Fault Code.

      The <number> represents a numeric value ranging from 0 to 5, indicating the top downtime reasons most frequently selected by the operator. You can configure reasons in the Plant Applications Administrator.

      Note: The values that appear in the **L1**, **L2**, **L3**, and **L4** boxes for the levels of reasons are configured in the Plant Applications Administrator and are automatically populated, if available, based on the reason you select in the **Top <number> Reasons** menu.

      Tip: Alternatively, you can select a downtime reason in the **L1** box, and then select the associated reason levels, if available, in the **L2**, **L3**, and **L4** boxes.
7. Select **Save** to split the downtime event in the required number of target downtime events.

Results

The target downtime events appear in the table displaying the list of downtime events and their details in the **Events** page.

Merge Downtime Events

About This Task

You can merge multiple downtime events into one event.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format.
3. Access the required downtime events list.
4. In the **Events** page, select  for each source downtime event that you want to merge into a single downtime event.

   Note: You can merge downtime events associated with the equipment from the same location only.
5. Select  to merge the selected events.

Results

The merged downtime event appears in the table displaying the list of downtime events and their details in the **Events** page.

Note:

- When you merge downtime events, the time interval between the source downtime events is also added to the downtime duration of the merged downtime event.
- If the reasons for downtime differ between the source downtime events, the new merged downtime event uses the reason associated with the oldest source downtime event.

Delete a Downtime Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Events** page appears, displaying a list of downtime events and their details in a tabular format.
3. In the table displaying the list of downtime events and their details, select  to delete a single or multiple downtime events.

   Note:

   - To delete a downtime event, select  for the downtime event in the table displaying the list of downtime events and their details.
   - To delete multiple downtime events, select  for each of them in the table displaying the list of downtime events and their details, and then select  to delete the selected downtime events.

Results

The selected downtime events are deleted and no longer appear in the table displaying the list of downtime events and their details in the **Events** page.

Chapter 10

Equipment

Topics:

About Equipment

As a supervisor, you can use the Equipment application to review summary and status information for plant lines and units. Here, you can identify production inefficiencies contributing to lower OEE.

Note: To access information about a Production Unit in the Equipment application, you must specify Production Rate Specification for the Production Unit in the Plant Applications Administrator. Else, the Production Unit does not appear in the Equipment application. For more information, refer to the OEE: Production Metrics topic in the Proficy Plant Applications Help.

The following donut charts display line and machine metrics:

- OEE: Overall equipment effectiveness (OEE) is a measure of production health or status. By comparing OEE between machines or group of machines, you can identify lines or machines with production inefficiencies like waste, downtime, speed/performance loss, and production throughput that contribute to lower OEE.
- Performance: You can review line and unit performance rates to compare how much each line or unit produced against projections.
- Quality: You can review the quality rate to identify lines with high waste counts, which reduces quality and contributes to a lower OEE.
- Availability: You can review the Availability rate for a Machine or group of Machines for a selected time range (for example, Current Shift, Yesterday).

The following Equipment dashboard displays information for the selected department HISTCENT, viewed by Lines in that department. It contains KPI information for each of the lines collected over the past week.

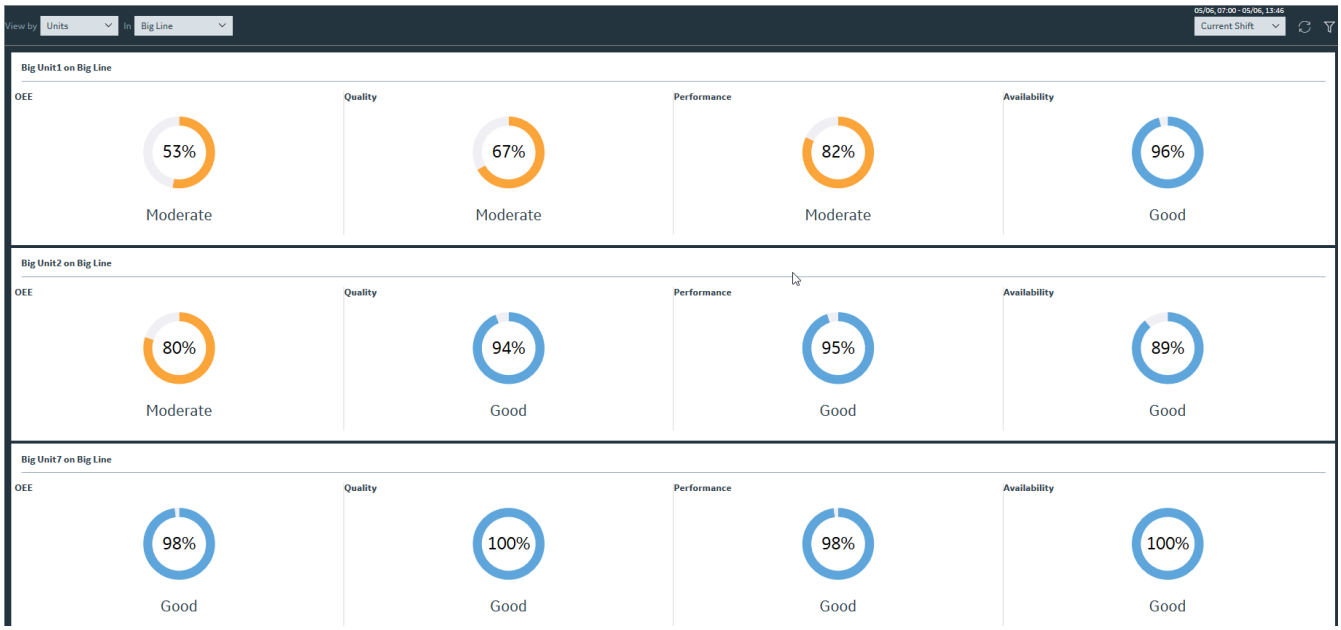


Figure 1: Equipment Dashboard

When you expand a KPI card, you can review detailed information such as downtime reasons, downtime by category, scrap breakdown, and loss by category as Pareto and waterfall charts.

The following example expands the view of the Availability KPI.

- In the **Downtime Breakdown** section, a Pareto chart displays the downtime breakdown by reasons, while in the **Downtime by Category** section, a waterfall chart displays the downtime by category.

- In the **Downtime Breakdown** or **Downtime by Category** section, select an option in the **View by** drop-down list box to view the chart by Duration or Count.
- You can access a similar expanded view for Quality and Performance KPIs.

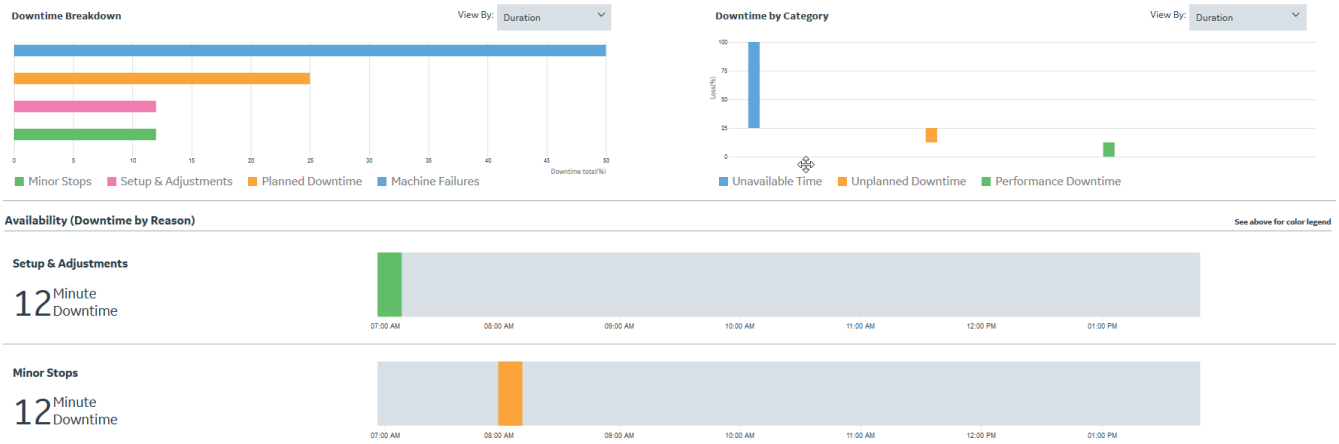


Figure 2: Availability: Expanded View

A Gantt chart displays the up and downtime on the time axis. The grey colored vertical strips represent the up-time, and the other colored strips display the downtime events for different categories.

If you select the Line level, the Gantt chart displays the downtime events for individual Units. If you select the Unit level, the Gantt chart displays the individual downtime reasons. In both the cases, colors displayed for the downtime events are based on the categories, and they are inconsistent with the Waterfall and Pareto charts.

When you pause on a chart, a tooltip displays the following details:

- Fraction: Corresponding percentage of the total downtime
- Count: Number of events
- Duration: Downtime duration

You can use the Equipment application to perform the following tasks.

- Access the Equipment Summary on page 106

Access the Equipment Summary

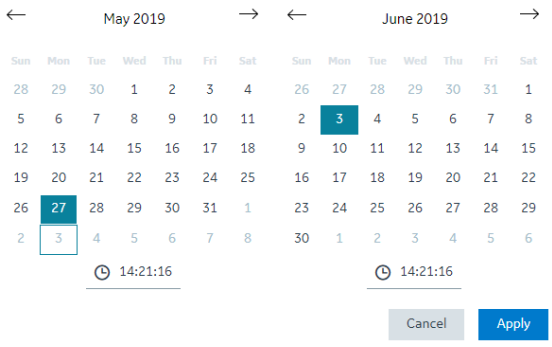
The Equipment application in Plant Applications enables you to access the summary of Equipment for the Production Lines in a Department or Production Site or Production Units in a Production Line. The Equipment summary appears as a series of Donut charts for KPIs such as OEE, Performance, Quality, and Availability.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   A page displaying the Equipment summary appears.
3. Select an option in the **View by** box as described in the following table.

Option	Description
Summary	When you select this option, a summary for all the Production Lines with Low OEE across departments appears in the page. This option is selected by default.
Lines	When you select this option, an **In** box appears, in which you can select a Department. After you select a Department, the page displays the Equipment summary for the Production Lines within the selected Department.
Units	When you select this option, an **In** box appears, in which you can select a Production Line. After you select a Production Line, the page displays the Equipment summary for the Production Units within the selected Production Line.

4. In the drop-down list box next to the **View by** box, select a time range as described in the following table.

Option	Description
Current Shift	Select to access the summary of the Equipment in the ongoing shift. By default, this option is selected.
Last Shift	Select to access the summary of the Equipment in the shift prior to the current shift.
Today	Select to access the summary of the Equipment on the current Production Day.
Yesterday	Select to access the summary of the Equipment from the day prior to the current Production Day.
Current Week	Select to access the summary of the Equipment within the ongoing Production Week.
Last Week	Select to access the summary of the Equipment within the Production Week prior to the current Production Week.
Custom	Select to access the summary of the Equipment within a date and time range that you specify by using a calendar window. The following calendar window appears when you select the **Custom** option.  To specify a custom date and time range in the calendar window: a. In the **START DATETIME** section, select a date and enter a time in the format hh:mm:ss. b. In the **END DATETIME** section, select a date and enter a time in the format hh:mm:ss. c. Select **Apply**.

Note: If there are no shifts configured for the plant, the **Current Shift** and **Last Shift** options do not appear.

The time range calculations for the **Current Shift** and **Last Shift** time range options are based on the `Site_Parameters` table rather than the `Crew_Schedule` table.

In the page displaying the Equipment summary:

- The time range that you select appears.
- The Donut charts summarizing OEE, Quality, Performance, and Availability for each KPI appear

Note: These KPI metrics are based on the **OEE Aggregation Store** setting. If **OEE Aggregation Store** is set to False, the values are calculated on the fly every time the chart is opened or refreshed. If it is set to True, the values are populated from the OEE Aggregation tables. For more information, refer to the About OEE Aggregation Store on page 140 topic.

Each KPI card displays the following status information.

Status	Colors	Range
Good	Blue	> 85 percent
Moderate	Yellow	> 50 percent and <= 85 percent
Low	Red	<= 50 percent

Note: The maximum value for the KPIs are set to 100% by default. However, you can override this by setting **OEE Max Limit Override** to true. The OEE Max Limit Override flag allows the OEE cap beyond 100%. When this flag is set to false and the KPI actual value is more than 100%, the value is defaulted to 100% in the chart.

5. To access the detailed KPI information, select **+** in the KPI card. The Availability KPI card with the detailed KPI information also includes summary statistics.

   Note: The detailed KPI information is not available for the OEE KPI card.

   The Pareto and Waterfall charts that show the detailed information for the selected KPI appear in the page displaying the Equipment summary. When you select **+** for a KPI card, the charts appear, displaying information about the KPI as described in the following table.

KPIs	Description
Quality	Displays the following details about the calculated Quality by product: • **Scrap Breakdown**: A Pareto chart displaying the top five reasons for the scrap breakdown. Select **Get By Duration** to access the breakdown information by duration. • **Loss By Product**: A Waterfall chart displaying losses by product. **Note:** In the **View by** box for a chart, select **Quantity** or **Count** to access the data according to the selected option in the chart.
Performance	Displays the following details about the calculated Performance by product: • **Speed Loss Breakdown**: A Pareto chart displaying the top five reasons for the speed loss breakdown. • **Speed Loss By Category**: A Waterfall chart displaying speed losses by category. **Note:** In the **View by** box for a chart, select **Duration** or **Count** to access the data according to the selected option in the chart.
Availability	Displays the following details about the calculated Availability related to the uptime of the machine: • **Summary Statistics**: A list of the number of events, total downtime, mean time to repair (MTTR), and mean time between failures (MTBF) values. By knowing MTBF and MTTR values, you can schedule around the availability of the Equipment while informed of the time between failures and the time it takes to resolve issues, thus enhancing OEE. • **Downtime Breakdown**: A Pareto chart displaying the top five reasons for the downtime breakdown. • **Downtime by Category**: A Waterfall chart displaying downtime by category. • A list of reasons for the downtime and color-coded charts that display uptime and downtime for the selected time range. **Note:** In the **View by** box for a chart, select **Duration** or **Count** to access the data according to the selected option in the chart.

When you hover over any bars in the charts, the tooltip displays the information about the attributes described in the following table.

Attribute	Description
Fraction	Corresponding percentage of the total downtime
Count	Number of events
Duration	Downtime duration

6. **Optional:** Select  , then select the **NPT** check box, and then select **Apply** to include any non-productive time (NPT) in the results. For more information, refer to the About Non-Productive Time in Downtime Calculations on page 88 topic.

Chapter 11

Reports

Topics:

About Reports

As a supervisor, you can generate OEE and production status reports for selected assets, displayed as a series of cards.

The Reports application enables you to generate OEE and production status reports for selected assets, displayed as a series of cards. You can access the KPI reports and production status of the plant by Department, Production Line, and Production Unit. The application also provides information about Planned vs. Actuals for each KPI.

The OEE reports track production conditions and events that contribute to manufacturing inefficiencies related to downtime, waste, and production throughput. The application automatically tracks OEE by product and order.

Note: To access information about a Production Unit in the Reports application, you must specify the **Production Rate Specification** attribute for the Production Unit in the Plant Applications Administrator. Else, a message indicating the non-availability of data for the corresponding unit appears in the Reports application. For more information, refer to the OEE: Production Metrics topic in the Proficy Plant Applications Help.

OEE is derived as a product of the following metrics:

OEE = Availability x Performance x Quality

Note: For information about the calculation of OEE parameters for time-based units, refer to the OEE Parameters Calculation for Time-Based Units on page 115 topic.

When reporting OEE statistics, the following thresholds apply:

Good	> 85 percent
Moderate	> 50 percent and <= 85 percent
Low	<= 50 percent

Note: The maximum value for the KPIs are set to 100% by default. However, you can override this by setting **OEE Max Limit Override** to true. The OEE Max Limit Override flag allows the OEE cap beyond 100%. When this flag is set to false and the KPI actual value is more than 100%, the value is defaulted to 100% in the chart.

The production status report provides data related to tracking of products and order-completion status (scheduled for production, in progress, or completed).

In the Reports application, in the **Show** list, you can select one of the following options to generate the corresponding report type:

- **Product OEE**: Displays the OEE report for a product. You can expand a row in the search results to compare planned versus actual KPI data for the product as shown in the following image.

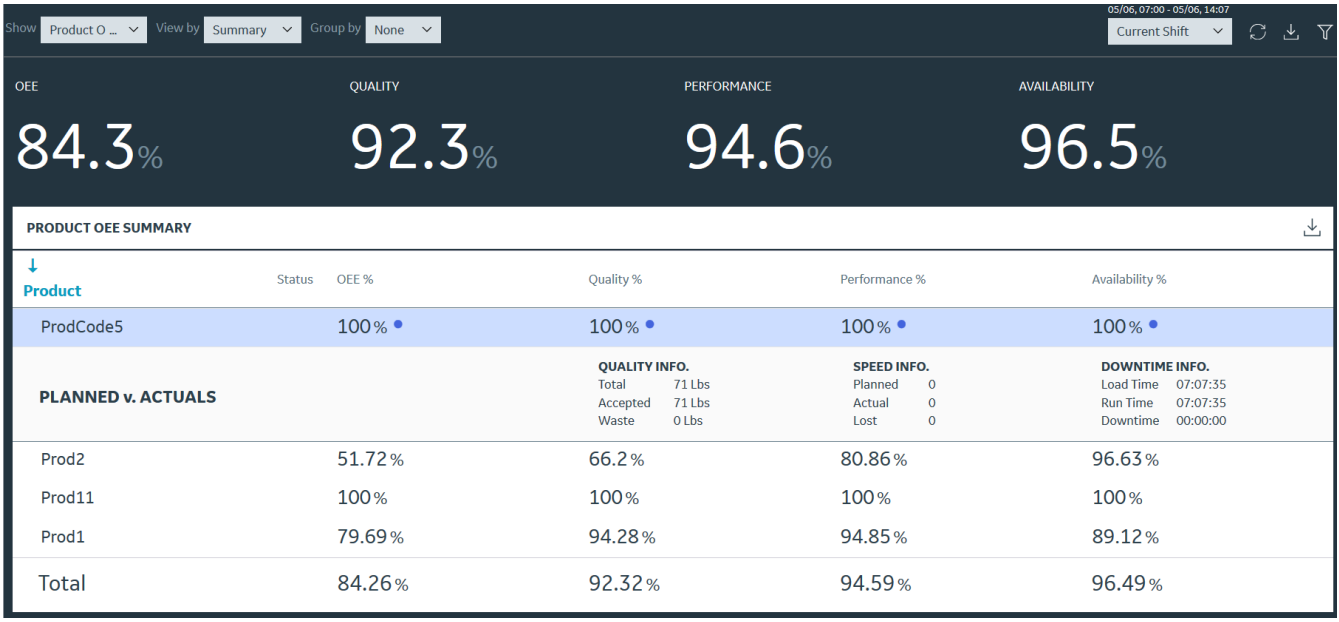


Figure 3: Product OEE Report

- **Order OEE**: Displays the OEE report for an order. You can expand a row in the search results to compare planned versus actual KPI data for the order as shown in the following image.

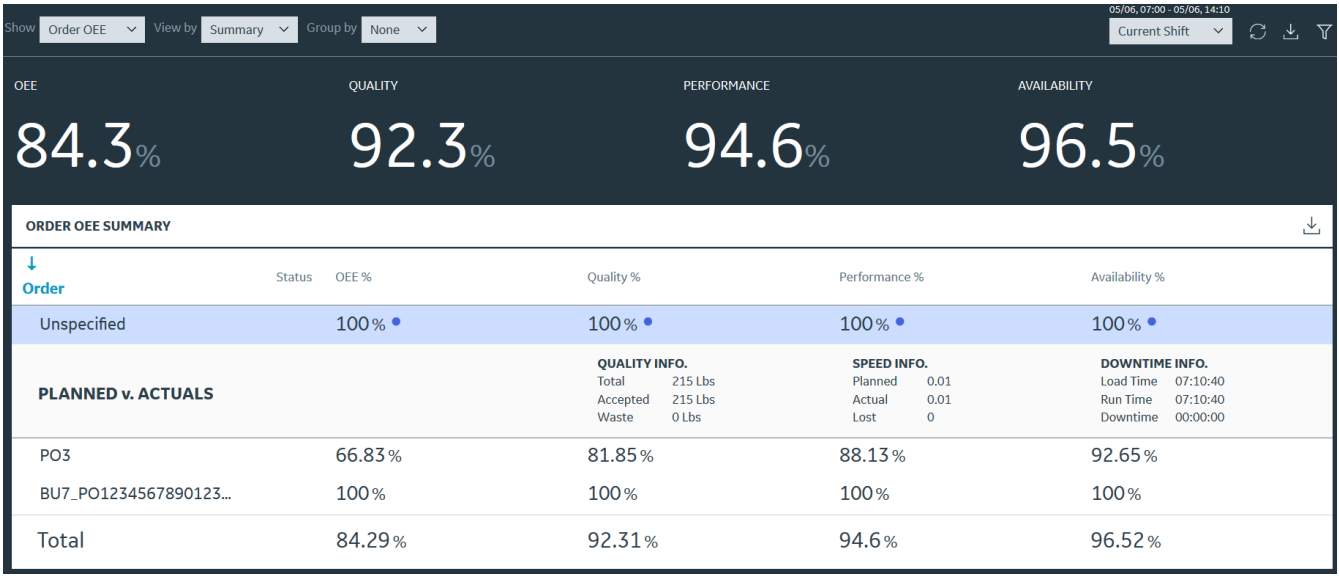


Figure 4: Order OEE Report

- **Production Status**: Displays the status of an order in a shift. You can expand a row in the search results to access more information about the order as shown in the following image.

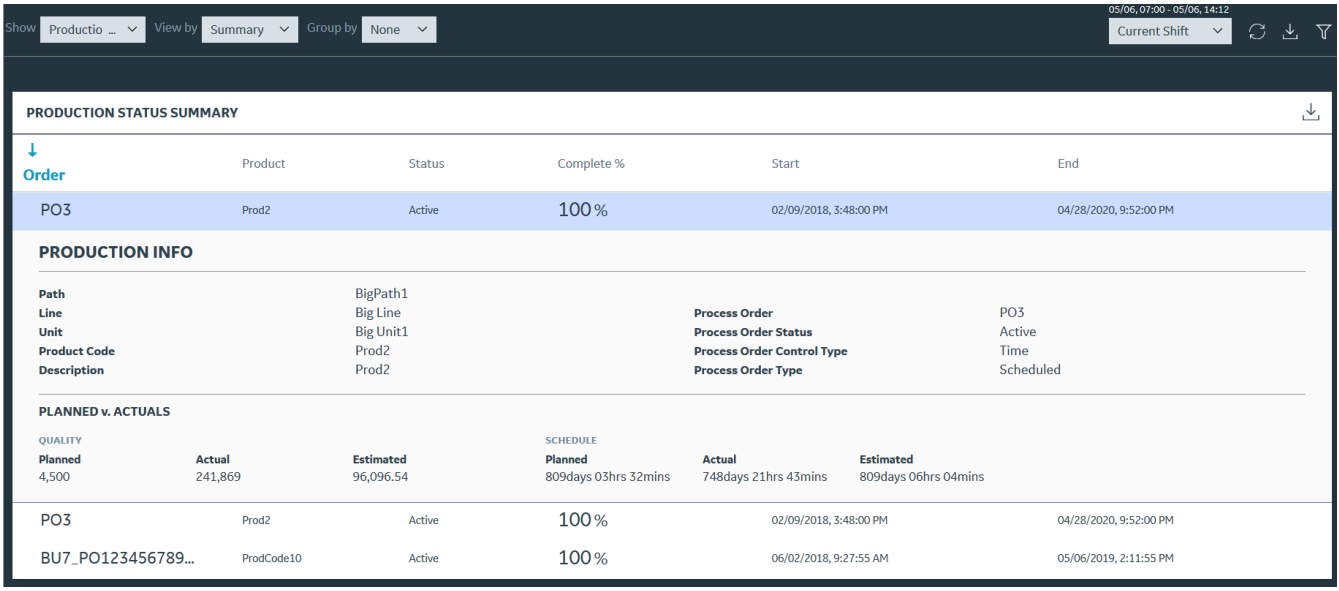


Figure 5: Production Status Report

Tip:

You can select  , select the **NPT** check box, and then select **Apply** to include any non-productive time (NPT) in these reports. For more information, refer to the About Non-Productive Time in Downtime Calculations on page 88 topic.

OEE Parameters Calculation for Production Lines

To calculate an OEE parameter (Availability, Performance, or Quality) value for a Production Line, the corresponding OEE parameter for each Production Unit within the Production Line are summed up based on the OEE mode selected for the Production Unit. For more information, refer to the following topics:

- OEE Parameters Calculation for Standard Units on page 113
- OEE Parameters Calculation for Time-Based Units on page 115

Note: These KPI metrics are based on the **OEE Aggregation Store** setting. If **OEE Aggregation Store** is set to False, the values are calculated on the fly every time the chart is opened or refreshed. If it is set to True, the values are populated from the OEE Aggregation tables. For more information, refer to the About OEE Aggregation Store on page 140 topic.

OEE Parameters Calculation for Standard Units

The classic OEE mode approach to the OEE calculation for standard units measures the performance and quality losses in terms of loss of production availability or productivity that are attributed to the performance and quality, respectively.

The classic OEE modes are Standard, None, Long Running 840D, and Long Running EDM are defined for a Production Unit in the Plant Applications Administrator. The OEE calculation formula for all these modes are same.

The OEE parameters Availability, Performance, and Quality for the standard Production Units are calculated based on the formula described in the following table.

OEE Parameter	Calculation Formula
Availability	Availability = Net availability run time/Planned production time Where, Net availability run time = Planned production time - Availability downtime
Performance	Performance = Actual production/Target production Where, • Actual production is the actual productivity of the Unit • Target production is the potential productivity of the Unit
Quality	Quality = Net production/Actual production Where, • Net production = Actual production - Waste • Actual production is the actual productivity of the Unit • Waste is the amount of rejected products

Classic-Mode OEE Parameters Calculation

In this example, the value for each OEE parameter per day for a bottle manufacturing plant is as shown in the following table.

Inputs	Value
Planned production time	24 hr
Availability downtime	1 hr
Actual production	900 bottles
Target production	1000 bottles
Waste	100 bottles

The following table provides the value of each OEE parameter calculated based on the formula described in the earlier section.

OEE parameter	Parameter value	Formula used	Explanation
Availability	23/24 = 0.125	Availability = Net availability run time/ Planned production time.	Planned production time = 24 hr Availability downtime = 1 hr Net availability run time = 24 - 1 = 23 hr
Performance	900/1000 = 0.9	Performance = Actual production/ Target production	Actual production = 900 bottles Target production = 1000 bottles
Quality	800/900 = 0.8889	Quality = Net production/ Actual production	Actual production = 900 bottles Waste = 100 bottles Net production = 900 - 100 = 800 bottles

OEE Parameters Calculation for Time-Based Units

The time-based approach to the OEE calculation measures the performance and quality losses in terms of loss of production time or downtimes that are attributed to the performance and quality, respectively.

The OEE parameters Availability, Performance, and Quality for the time-based units are calculated based on the formula described in the following table.

OEE Parameter	Calculation Formula
Availability	Availability = Net availability run time/Planned production time Where, Net availability run time = Planned production time - Availability downtime
Performance	Performance = Net performance run time/Net production time Where, • Net production time = Planned production time - Availability downtime • Net performance run time = Net production time - Performance downtime
Quality	Quality = Net quality run time/Net production time Where, • Net production time = Planned production time - Availability downtime - Performance downtime • Net quality run time = Net production time - Quality downtime

Time-Based OEE Parameters Calculation

In this example, the value for the production time and downtime for each OEE parameter is as shown in the following table.

Inputs	Value
Planned production time	60 minutes
Availability downtime	10 minutes
Performance downtime	10 minutes
Quality downtime	10 minutes

The following table provides the value of each OEE parameter calculated based on the formula described in the earlier section.

OEE parameter	Parameter value	Formula used	Explanation
Availability	50/60 = 0.8333	Availability = Net availability run time/ Planned production time.	Planned production time = 60 minutes Availability downtime = 10 minutes Net availability run time = 60 - 10 = 50 minutes
Performance	40/50 = 0.8	Performance = Net performance run time/Net production time	Planned production time = 60 minutes Availability downtime = 10 minutes Performance downtime = 10 minutes Net performance run time = 50 - 10 = 40 minutes Net production time = 60 - 10 = 50

OEE parameter	Parameter value	Formula used	Explanation
Quality	30/40 = 0.75	Quality = Net quality run time/Net production time	Planned production time = 60 minutes Availability downtime = 10 minutes Performance downtime = 10 minutes Quality downtime = 10 minutes Net quality run time = 50 - 10 = 40 minutes Net production time = 60 - 10 - 10 = 40 minutes

Viewing Reports

You can view the **Reports** summary for Product OEE, Order OEE, and Production status as a series of cards based on selected assets.

Procedure

1. On the **Reports** screen, select an option from the **Show** drop-down list.
   - Product OEE
   - Order OEE
   - Production Status

   Show determines the data to be displayed on the cards, such as OEE data or Production Status tracking data.

2. Select one of the following from the **View by** drop-down list:
   - Summary (Default option)
   - Department
   - Line
   - Unit

   View by determines the physical assets upon which the display is based, such as Departments, Lines, and Units, with an additional summary view.
3. You can group the information as per your requirement

View by option	Grouping options
Summary (default option) or Department	**Group by** drop-down-list contains the following options: • None (default option) • Shift • Crew
Line	**In** drop-down list contains a full list of department names. Example: • *Department 1* • *Department 2* • *Department 3* You can also group results by none, shift, or crew.
Unit	**In** drop-down list contains a full list of line names. Example: • *Line 1* • *Line 2* • *Line 3* You can also group results by none, shift, crew, or path.

4. Select the required time range and click the refresh button next to the drop-down to view and update the results.
   - Current Shift (Default)
   - Last Shift
   - Today
   - Yesterday
   - Current week
   - Last week
   - Custom
   - Tomorrow (for Production Status only)
   - Next Week (for Production Status only)
   - Next Shift (for Production Status only)

   The time range that you select will be displayed in the form of date and time next to the time-interval drop-down list. The **Reports** screen generates the report for the selected options. For example, if you select **Product OEE** by **Line** in *department 1* grouped by **Shift** for the current shift, the application generates a list with the following information:

   - A summary of KPIs is displayed at the top: OEE, Quality, Performance, and Availability

     Note: The KPI values are based on the selected time range and not on the Product or Order time durations.
   - For each line, grouped by shift, following columns are displayed:
     - `Product` – Products produced on the Machine or Machine group. If the report selected is **Product OEE**, this column shows the Product information. If the report selected is **Order OEE**, this column shows the Order information.

    - Status – When an OEE exceeds an established threshold, the Status column displays a red dot.
    - Separate columns display each KPI for the listed products: OEE %, Performance %, Availability %, and Quality %.
    - The last row for each shift displays the Total value rolled up for each KPI card.

  If you select **Production Status** in the **Show** drop-down list, you see the production status report for the model context selected through **View By** and **In** drop-down list and grouped by the **Group by** category. The report view includes the following information:

  - Order (sortable) – The list of Orders in the Machine or Machine Group, or as a Summary, as per the orders configured in the Plant during the time range selection made.
  - Product – Name of the Product associated with the Order in the row.
  - Status – the status of the Order (for example: Completed, Active, Pending).
  - Complete % – completion percentage at the time the Report is displayed.
  - Start – start time of the Order. If the Order has already started or completed, this time shows the actual time, else it displays the planned time.
  - End – End time of the Order. If the Order is already completed, this time shows the actual time, else it displays the planned time. If the order is in process, it displays the estimated time.
  - In-line View – If you select a row, an in-line view opens, displaying Production Information along with the Planned vs. Actual values of Quality and Schedule.
5. **Optional:** Click a row to see the color chips for all the three KPIs. The colors of these chips indicate the ranges of the KPI values which are static and are not based on Product or plant model context.
6. **Optional:** Click a row to see the details of the KPIs of that particular row.
   The row expands to display Planned vs. Actual raw values of the KPIs for the corresponding row.
7. **Optional:** For any combination of the Options selected, once the data is retrieved and displayed they can be exported to a csv file by clicking the export icon on the right top corner of the cards.

Chapter 12

My Machines

Topics:

Select Machines

About This Task

As an Operator, you can use the My Machines application to select machines from the list of machines accessible to you across a plant model. The selected machines are set as your user preferences in the Plant Applications Universal Client. The other applications in the Plant Applications Universal Client, such as Downtime Displays and Reports, display their application-specific data for only those machines that were set as your user preferences.

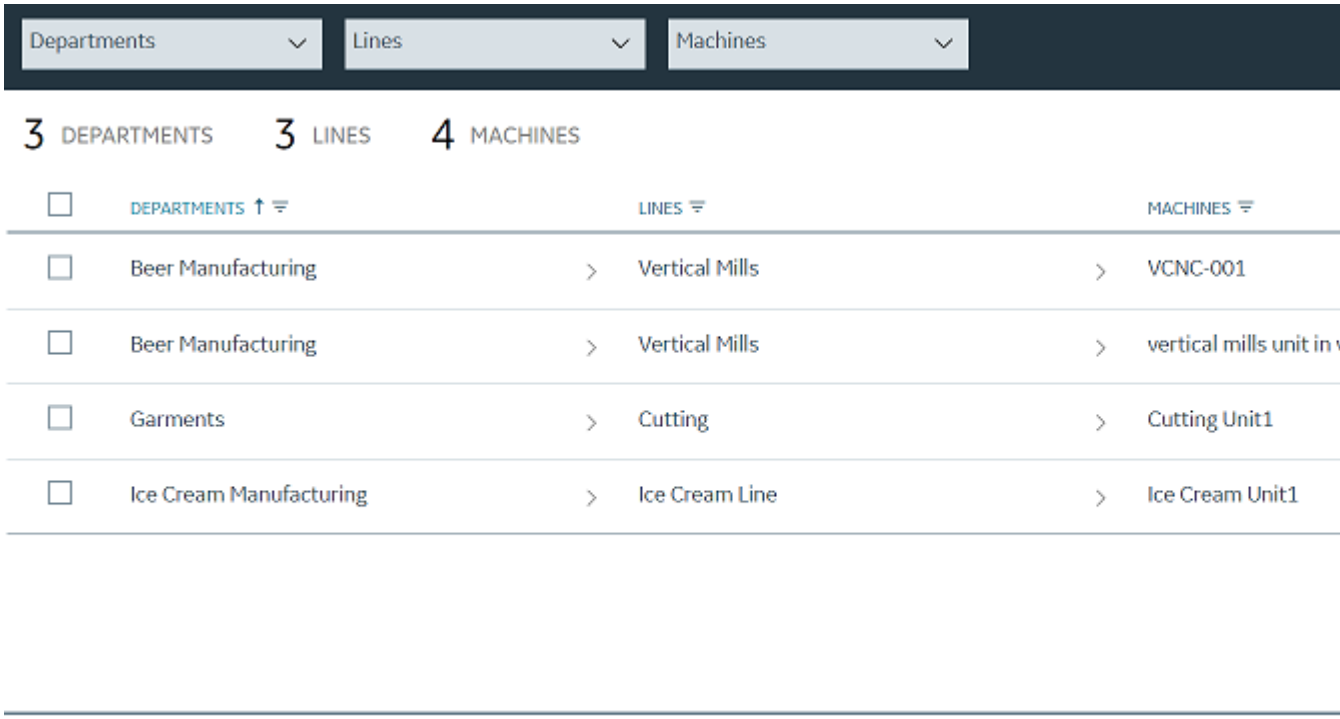
Note: Two user preferences are stored for a user. You can switch back to previous user preference using the Restore Previous Profile button.

When you load the My Machines application for the first time or if no machines are selected, in the **Selected Machines** section, the machines for which you have write access appear.

Procedure

1. Select the relevant departments, lines and machines from the **Departments**, **Lines** and **Machines** boxes, respectively. The list of machines appears.
2. Select the machines you want to set as your user preferences.

   Note: The values that appear in the **Department**, **Line**, and **Machine** boxes are based on the Production Units associated with an active Display for which you have write access. You can configure Production Units for a Display in the Plant Applications Administrator.



3. Select **Save**.

Based on machines selected in the My Machines application, application-specific data appears in the other applications. For example, in the **Events** page in the Downtime Displays application, the downtime records for the machines selected in the My Machines application appear.

Chapter 13

Analysis

Topics:

About Analysis

As a supervisor, you can use the Analysis application to plot historical and live charts to visualize time series data available in Plant Applications and Historian.

Analysis application displays information for production batches in the form of a Gantt chart.

It enables operators, supervisors, and process engineers to analyze time series data and live issues, and to quickly troubleshoot issues and make improvements. Process engineers can also analyze the production batches and golden batches information.

Analyze a Process Order

About This Task

You can use the Analysis application to analyze one or more Process Orders when Plant Applications is configured to use process orders instead of batches. In some organizations, a batch is identified as a process order number. In this scenario, the process order quantity is the batch quantity produced in a production run.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Chart Configuration** page appears.
3. In the **Plant Model** list, select a plant model associated with the process order.
4. In the **Data type** list, select **Process Orders**.

   Note: The **Process Orders** option appears only when the Plant Applications universal client is configured to use process orders instead of batches.
5. Search for the process order that you want to analyze, and then, in the **Process Orders** section, select **Add Process Orders**.

   Tip: You can add multiple process orders to compare their details.
6. Select **Plot** to access the **CHART CONTROLS** page, and then analyze the process order.

   Tip: Alternatively, you can select  to access the **CHART CONTROLS** page.

   By default, the **CHART CONTROLS** page appears in Normal View and a Gantt chart appears for the selected process order.

   If you selected only one process order, the process order available in the five days before and after the selected process order also appears in the chart. You can hover over a process order to view its details. For more information about trend charts, refer to the Types of Trend Charts on page 134 topic.

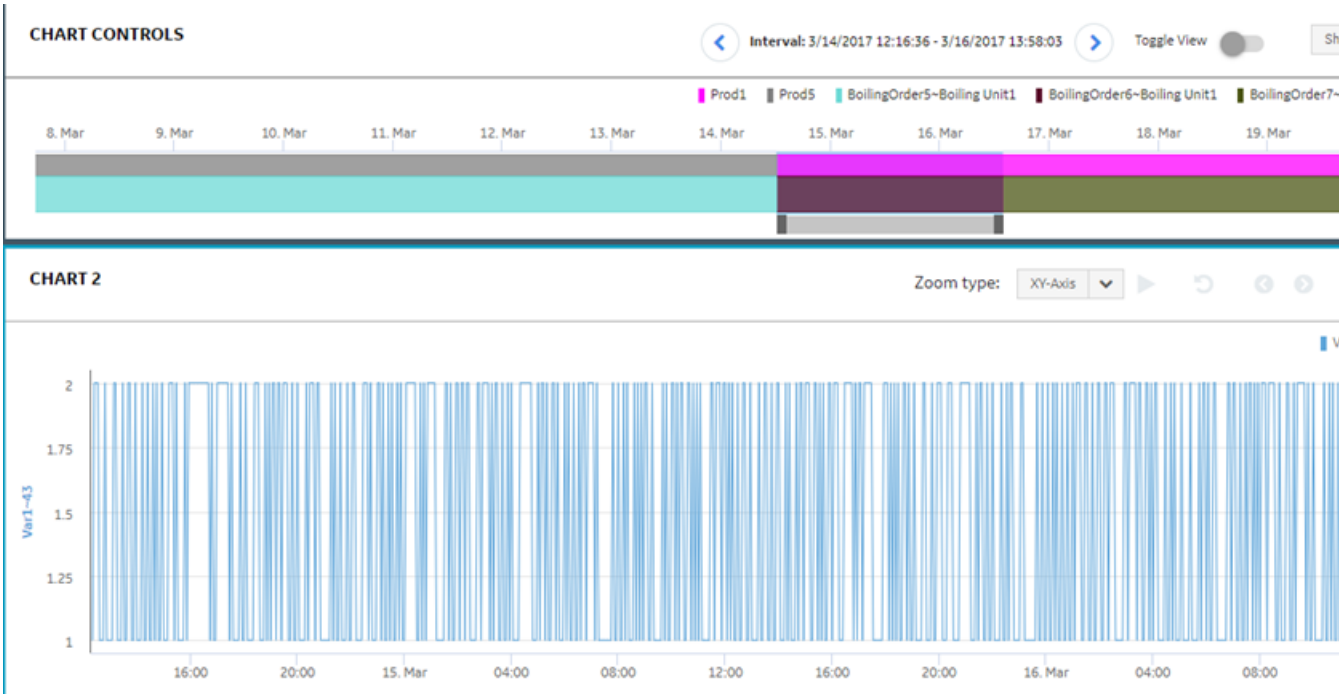
   In the **CHART CONTROLS** page, you can use the **Toggle View** option to toggle between the interval and duration modes.

   If you selected multiple process orders, then the Gantt chart appears in the duration mode only.
7. Analyze the selected process order with respect to variables in a Line chart by following these steps:

a. Select to go back to the **Chart Configuration** page.
b. In the **Data type** list, select **Variables**.
c. Search for the variables you want to plot in the Line chart, then select **Add Chart**, and then select **Plot** to plot the selected variables for the selected process order in a single Line chart.

   Tip: Select **Add Chart** to add more charts and plot a single variable or a combination of variables in different charts.

In the **CHART CONTROLS** page, the Line chart appears in the **CHART 2** section after the Gantt chart as shown in the following image.



You can set the time slider bar for the required time duration for the process order. When you update the time duration for the process order in the Gantt chart, the application updates the corresponding Line chart displaying the time series data. In addition, the application synchronizes the horizontal axis for the Gantt and Line charts.

Analyze a Batch

You can use the Analysis application to analyze a batch, compare the batch with the other batches, navigate to previous and next batches, and compare how the variables associated with the batch produced trend over the batch duration. The ANSI/ISA–88.01–1995 documentation defines a batch as the material that is being produced or that has been produced by a single execution of a batch process or an entity that represents the production of a material at any point in the process. Batches are produced on a single equipment or a process cell. A golden batch is a batch that is identified to be used as a reference batch for a few specific KPIs such as the best yield, lowest waste, best quality, and higher productivity.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .

The **Chart Configuration** page appears.

3. In the **Plant Model** list, select a plant model associated with the batch.
4. In the **Data type** list, select **Batches**.

   Note: The **Batches** and **Golden Batches** options appear only when the Plant Applications universal client is configured to use batches instead of process orders.
5. Search for the batch that you want to analyze, and then, in the **Batches** section, select **Add Batches**.

   Tip: You can add multiple normal batches or golden batches to compare their details. For more information, refer to the Add Tags, Variables, KPIs, Process Orders, and Batches on page 128 topic.
6. Select **Plot** to access the **CHART CONTROLS** page, and then analyze the batch.

   Tip: Alternatively, you can select  to access the **CHART CONTROLS** page.

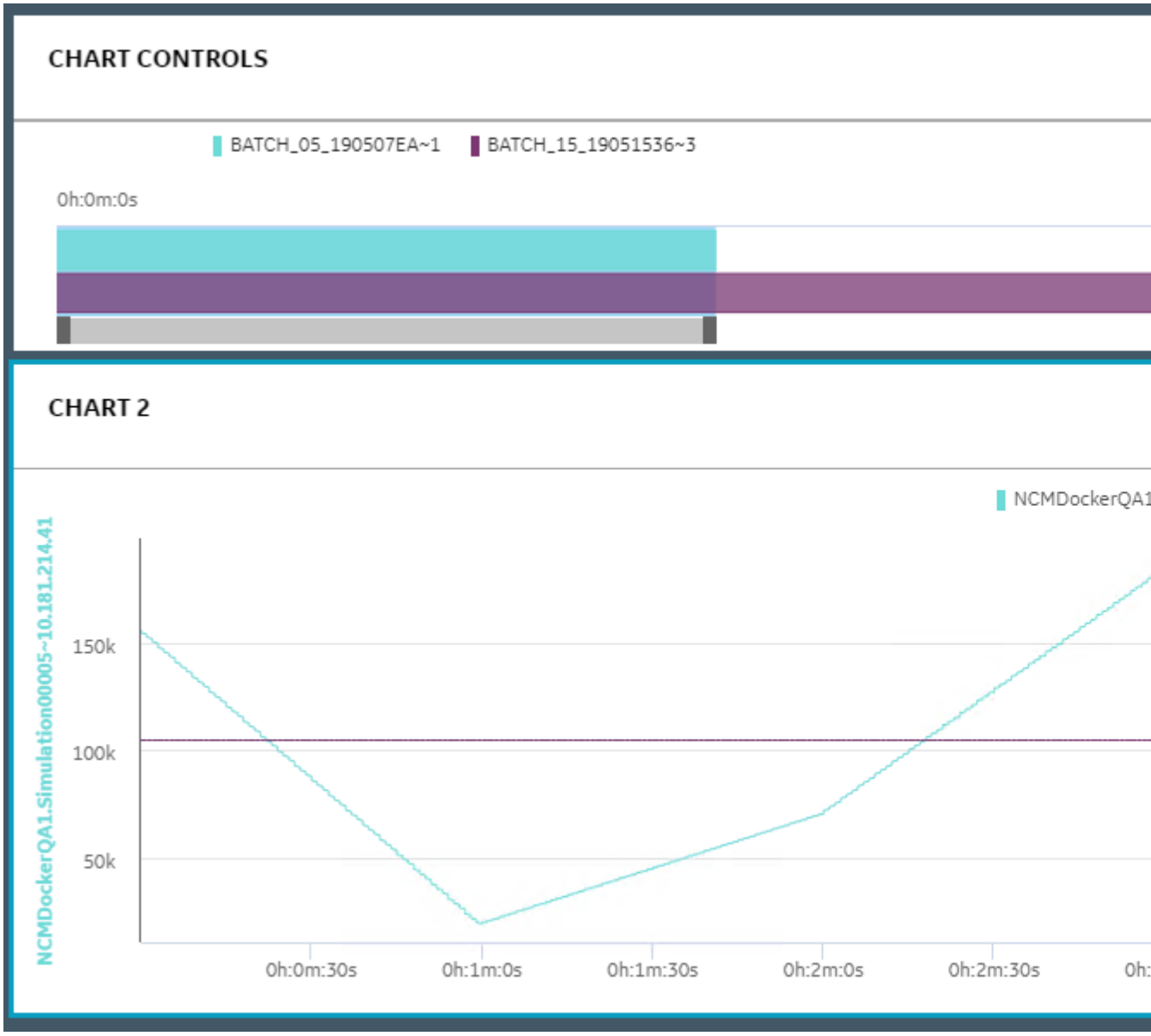
   By default, the **CHART CONTROLS** page appears in **Normal View**, displaying a Gantt chart for the selected batch. If you selected only one batch, the batches available within the five days before and after the selected batch also appears in the chart. You can hover over a batch to view its details. For more information about trend charts, refer to the Types of Trend Charts on page 134 topic.

   In the **CHART CONTROLS** page, you can use the **Toggle View** option to toggle between the interval and duration modes.
7. Analyze the selected batch with respect to variables in a Line chart by following these steps:

   a. Select  to return to the **Chart Configuration** page.
   b. In the **Data type** list, select **Variables**.
   c. Search for the variables you want to plot in the Line chart, then select **Add Chart**, and then select **Plot** to plot the selected variables for the selected batch in a single Line chart.

      Tip: Select **Add Chart** to add more charts and plot a single variable or a combination of variables in different charts.

   In the **CHART CONTROLS** page, the Line chart appears in the **CHART 2** section after the Gantt chart as shown in the following image.



You can set the time slider bar for the required time duration for the process order. When you update the time duration for the process order in the Gantt chart, the application updates the corresponding Line chart displaying the time series data. In addition, the application synchronizes the horizontal axis for the Gantt and Line charts.

Add Tags, Variables, KPIs, Process Orders, and Batches

You can add Historian tags, Plant Applications variables, KPIs, process orders, batches, and golden batches to the **Analysis** page to trend required charts and display tables for analyzing information.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .

The **Chart Configuration** page appears. By default, the **Tags** option appears in the **Data type** list.

3. Select a context in the **Plant Model** list.

   Note: You must expand the plant name to navigate and select the required department, line, or unit of your plant. The selected department, line, or unit appears for the plant model in the **Plant Model** list.

4. Select the required Historian server in the **Historians** list.

   Note: The **Historians** list appears only when you select **Tags** in the **Data type** list. You can plot the Historian tags belonging to multiple Historian servers, limited to 10 servers only. The Historian server can be local or remote. A local Historian server is installed on the same node as the Process Analyzer. The remote Historian server is installed on a node different than that of the Process Analyzer. The minimum supported version is Historian 7.0 SP5 or later.

5. In the **Data type** list, select one of the following options:

   - **Tags**
   - **Variables**
   - **KPI** (available for lines and units only)
   - **Process Orders** (available only if the Plant Applications universal client is configured to use process orders)
   - **Batches** (available only if the Plant Applications universal client is configured to use batches)
   - **Golden Batches** (available only if the Plant Applications universal client is configured to use batches)

   Tip: To sort the search results, select a column name. To filter the data, select . For more information, refer to the topic Filter Tags, Variables, KPIs, Process Orders, and Batches on page 130.

6. Depending on the data type, select one of the following options as shown in the following table.

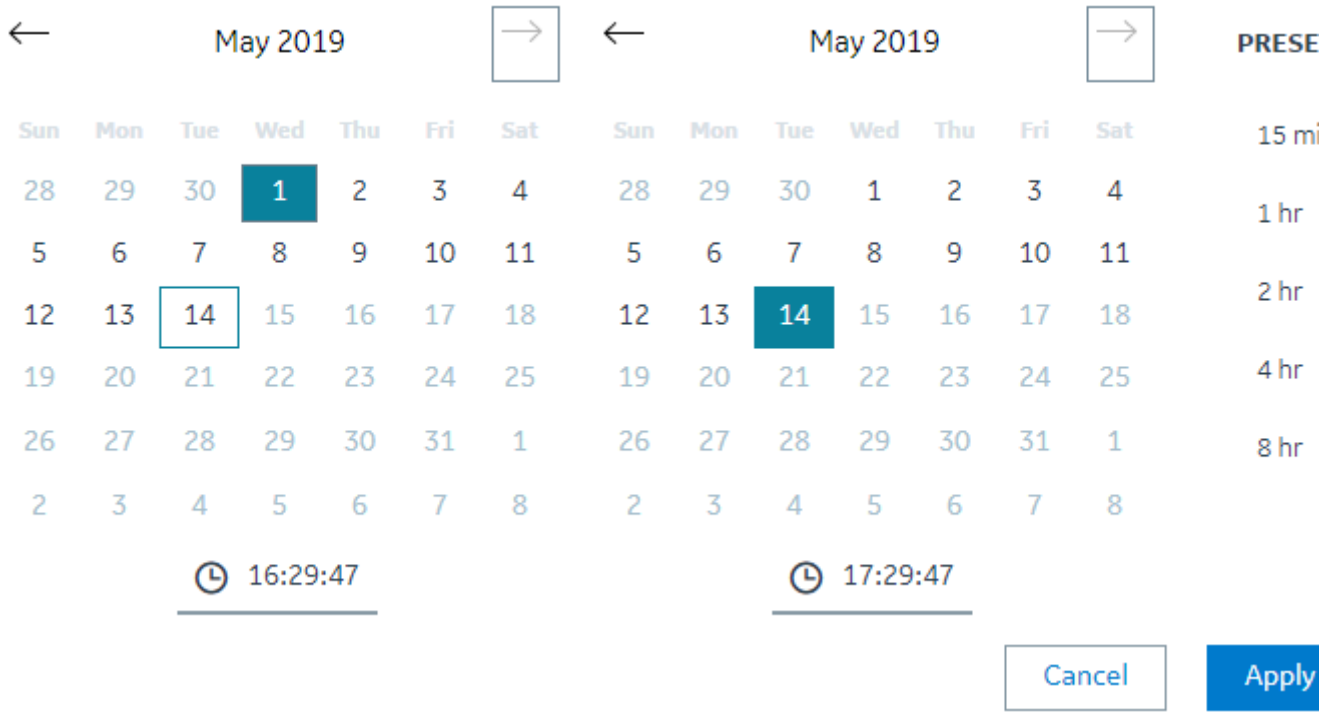
Data Type	Option
Variables	**Add Chart**
KPIs	**Add Chart**
Variables	**Add Chart**
Batches	**Add Batches**
Golden Batches	**Add Batches**
Process Orders	**Add Process Orders**

   You can select multiple items.

   Note: To add multiple items to an existing chart, select **Add Data** for the chart. Alternatively, to add a new chart, drag the required items to the **Add Chart** button. GE recommends that you should restrict the total count of tags or variables for Live charts to five to optimize the trend chart output.

7. Select to select an interval from the available Presets or to select a custom time interval by selecting the required dates and time, and then select **Apply**.

   The default time duration selected is the current time minus one hour. If you select an interval from the calendar, the chart is enabled to be plotted as the Historical chart instead of the Live chart.



8. After you add the required items to the charts, select **Plot**.
   With larger data samples the loading time of the analysis session may increase.
   A live chart is plotted on the screen as Chart 1.

Results

The **Analysis** page appears, displaying the required trend charts and information.

Tip: You can select to open the **Chart Configuration** page to search and add more tags, variables, KPIs, batches, or process orders for analysis. In the **Chart Configuration** page, you can select to open the **Analysis** page.

You can further save an analysis trend to restore the analysis view. The trends you save are accessible by all users. For more information, refer to the Save an Analysis Trend on page 137 topic.

Filter Tags, Variables, KPIs, Process Orders, and Batches

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Chart Configuration** page appears as shown in the following image. By default, the **Tags** option appears in the **Data type** list.
3. Select a context in the **Plant Model** list.

Note: You must expand the plant name to navigate and select the required department, line, or unit of your plant. The selected department, line, or unit appears for the plant model in the **Plant Model** list.

4. Select the required Historian server in the **Historians** list.
5. In the **Data type** list, select one of the following options:
   - **Tags**
   - **Variables**
   - **KPI** (available for lines and units only)
   - **Process Orders** (available only if the Plant Applications universal client is configured to use process orders)
   - **Batches** (available only if the Plant Applications universal client is configured to use batches)
   - **Golden Batches** (available only if the Plant Applications universal client is configured to use batches)
6. Select to filter the required data.
   The filter window appears based on the selected Data type.

Results

The data is filtered per your selections.

Access Trend Charts

About This Task

When you select tags, variables, or KPIs and add the data for analysis, your selections are added to a Live chart instance in the Analysis application.

Note: The following features are currently not available for live charts:

- Print preview and print
- Export
- Filter
- Zoom
- Range for y-axis
- Multifield and string tags

You cannot modify the live charts. The chart is autorefreshed with the x-axis duration set to 60 minutes.

Note: You can change the Sampling Mode of Trend Charts by changing the value of samplinMode property in **app.properties.json** file at **C:\Program Files\GE Digital\PlantApplicationsUniversalClient \NodeUIApp\process-analyzer-app\assets**. By default, the value is set to **Interpolated**. The interpolated values are displayed on the chart. Another permissible value of samplingMode property is **Trend**,in that selection all the sample count values are displayed.

Procedure

1. In the **Analysis** page, select to access the historical chart for a live chart.

   Note: Live mode is not supported when the batches with specific times are displayed along with Tags, Variables, and KPIs. You must edit the chart and select **Use Time** to reset before you switch to Live mode. For more information, refer to the Modify Charts on page 133 topic.
2. Select for a chart to access a menu containing **Chart Info** and to **Show Statistics** options.

- Select **Chart Info** to access the Chart Type, Start and End date and time, and Tags information.
- Select **Show Statistics** to access the Name of the trended tags, First Raw Value, Last Raw Value, Minimum Value, Maximum Value, Count, Raw Total, Raw Average, and Raw Standard Deviation.
- Select **Remove Chart** or select ✕ to delete the respective chart.

If you add more than two tags, variables, or KPIs to a chart for analysis, a common y-axis appears in the chart. The y-axis is automatically scaled based on the minimum and maximum values of all the individual y-axes.

3. **Optional:** To rename a chart, select the title, and then enter the new name.
4. **Optional:** Select to zoom backwards, or select to zoom forward for the saved zooms in a session.

   In a Historical chart, you can drag and select a time frame to analyze. You can zoom forward multiple times. The forward and backward zooms are saved for a session or until the zoom is reset. For example, if the trend chart represents a longer time frame of one month, you can zoom in to a shorter time frame for a week, and further zoom in to specific hours or minutes of a day to analyze the trend data.

   Note: When no data is available for a time window, or if the time window spans less than one second, you may not see any information.

   Select to reset the zoom to default.

   You can also select one of the following options in the **Zoom type** list to refine your selection:

   - **XY-Axis**: To zoom both x- and y-axes in the Historical chart.
   - **X-Axis**: To zoom only x-axis in the Historical chart.
   - **Y-Axis**: To zoom only y-axis in the Historical chart.
5. **Optional:** Use one of the following layout options.

Layout Options	Description
Multi-select mode	Selects multiple trend charts or events from the session. After selecting the required trend charts and events you can perform the following actions: • After you select multi-select mode, you can select to view one or two trend charts in full-screen mode. You can select to exit full-screen mode. • You can clear the **Multi-select mode** check box to return to the default mode. You cannot modify the charts in multi-select mode.
Normal View	Displays the default view.
Column View	Displays the trend charts and batches information in two columns.
Stacked View	Displays the trend charts and batches information as stacked rows.
(Show / Hide Chart controls)	Enables the following behaviors: • When the chart controls for the batches are not available, the chart controls are disabled. • When the chart controls for the batches appear, you can select the icon to hide chart controls. • When the chart controls for the batches are hidden, you can select the icon to show chart controls.

Layout Options	Description
 **(Export Trended Data)**	Downloads trended data (both good and bad qualities data) as a .csv file. **Note:** When the chart appears blank; that is, the plotted variable has no data, if you export trended data, dummy data of the type bad quality appears in the .csv file.
 **(Export Raw Data)**	Downloads raw data (only good quality data) as a .csv file. **Note:** When the chart appears blank; that is, the plotted variable has no data, if you export raw data, dummy data of the type bad quality appears in the .csv file.
 **(Preview Page)**	Previews available trend charts for printing. You can select the **Print Page** button to print the charts.
 **(Full screen)**	Displays the selected charts in full-screen mode. Select  to exit full-screen mode. **Note:** You cannot use the keyboard shortcuts like F11 (to run in full-screen mode) or Esc (to exist full-screen mode).
 **(Clear Analysis)**	Deletes the trend charts and event information from the current session.

Modify Charts

You can modify the type, color, and scale of a displayed chart.

Procedure

1. Select next to the tag name to access the editing menu for the respective trend.

   Note: You can enable or disable a trend on a chart by clicking on the respective tag name.
2. **Optional:** Select **Edit** to modify the following chart elements, and then select **OK** to apply the changes.

Select	Options
Type	• Line • Line Smoothed • Area • Area Smoothed • Scatter For more information about chart types, refer to the Types of Trend Charts on page 134 topic.
Color	Select a color for the trend chart.
Auto Scale	By default, Auto Scale is enabled. You can disable the default settings and provide your own range for the scale by providing Min and Max values.
Use Time	By default, Use Time is enabled, which means that the tag or variable uses the current time. You can disable the time and select the required date and time interval you want to analyze for the corresponding tag or variable.

3. **Optional:** Select the **Switch Y-Axis** option to switch the y-axis for the corresponding tag or variable.

4. **Optional:** You can show and hide rejection limits for the Plant Applications variables by using Show Spec Limits and Hide Spec Limits respectively. If the variable exceeds the rejection limits (L Rej, U Rej), the product is rejected.

   Note: You can only display specification limits for Plant Applications variables. By default, the variable specifications limits do not appear in the chart.
5. Select **Remove** to remove a chart or variable from a trend chart.

Types of Trend Charts

Trend charts are graphical representations for showing how the value of one or more items changes over time.

Trend charts can display information as Line, Area, and Scatter charts.

Line is the default type of chart.

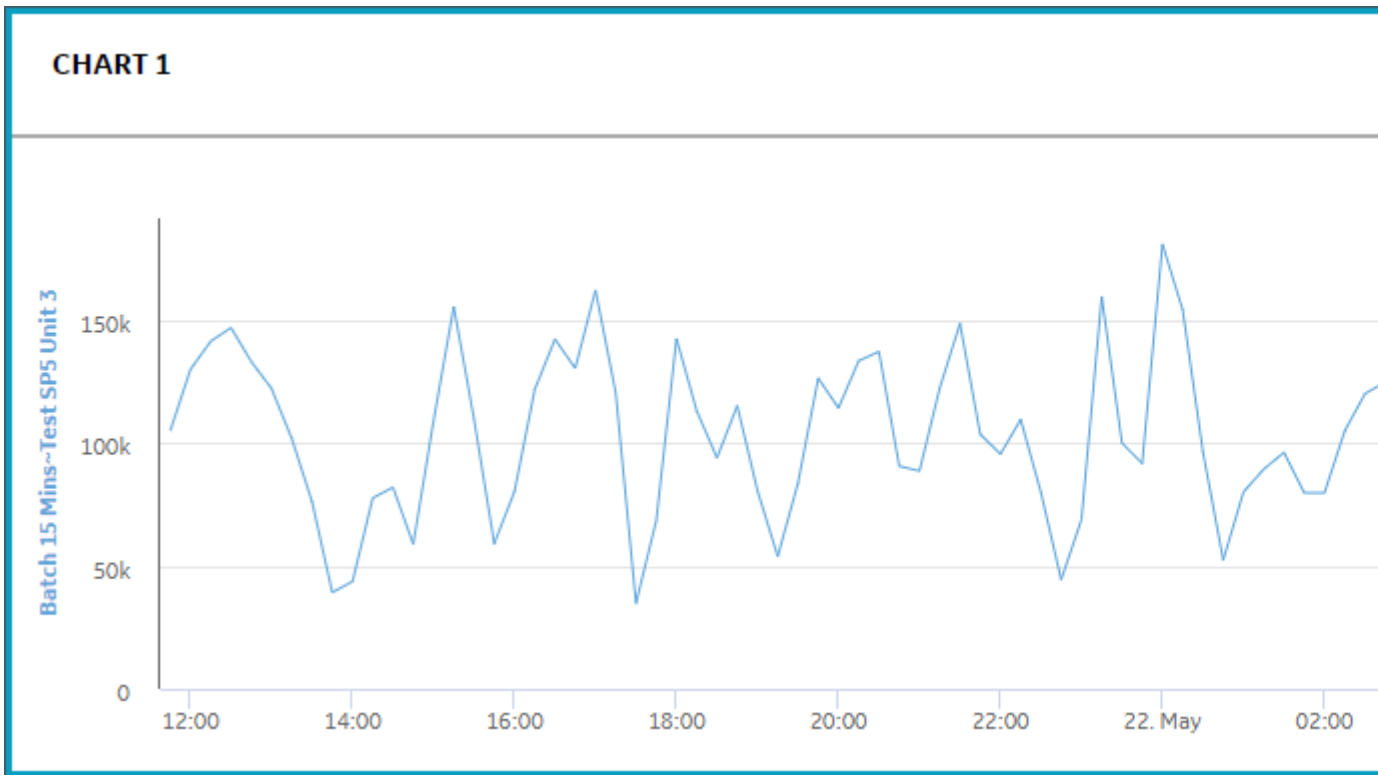


Figure 6: Line Chart

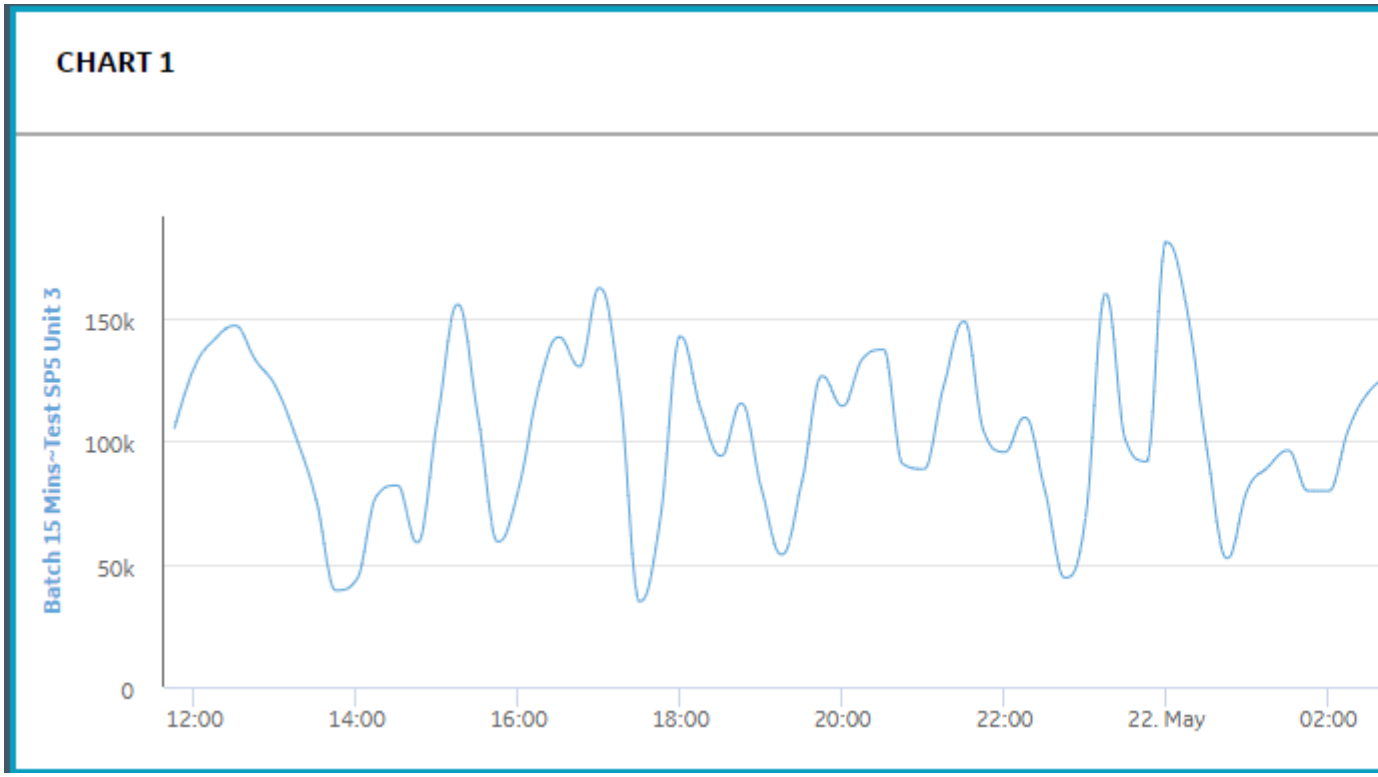


Figure 7: Line Smoothed Chart

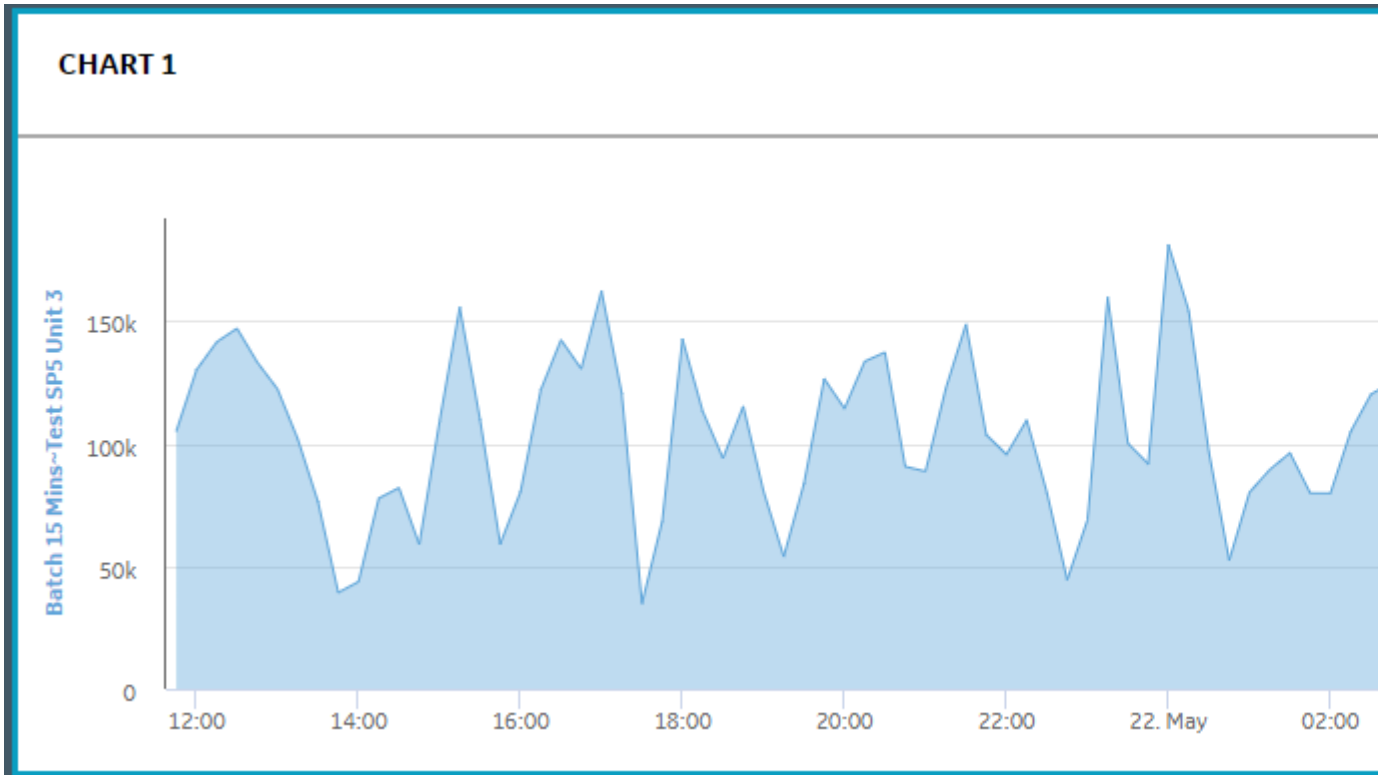


Figure 8: Area Chart

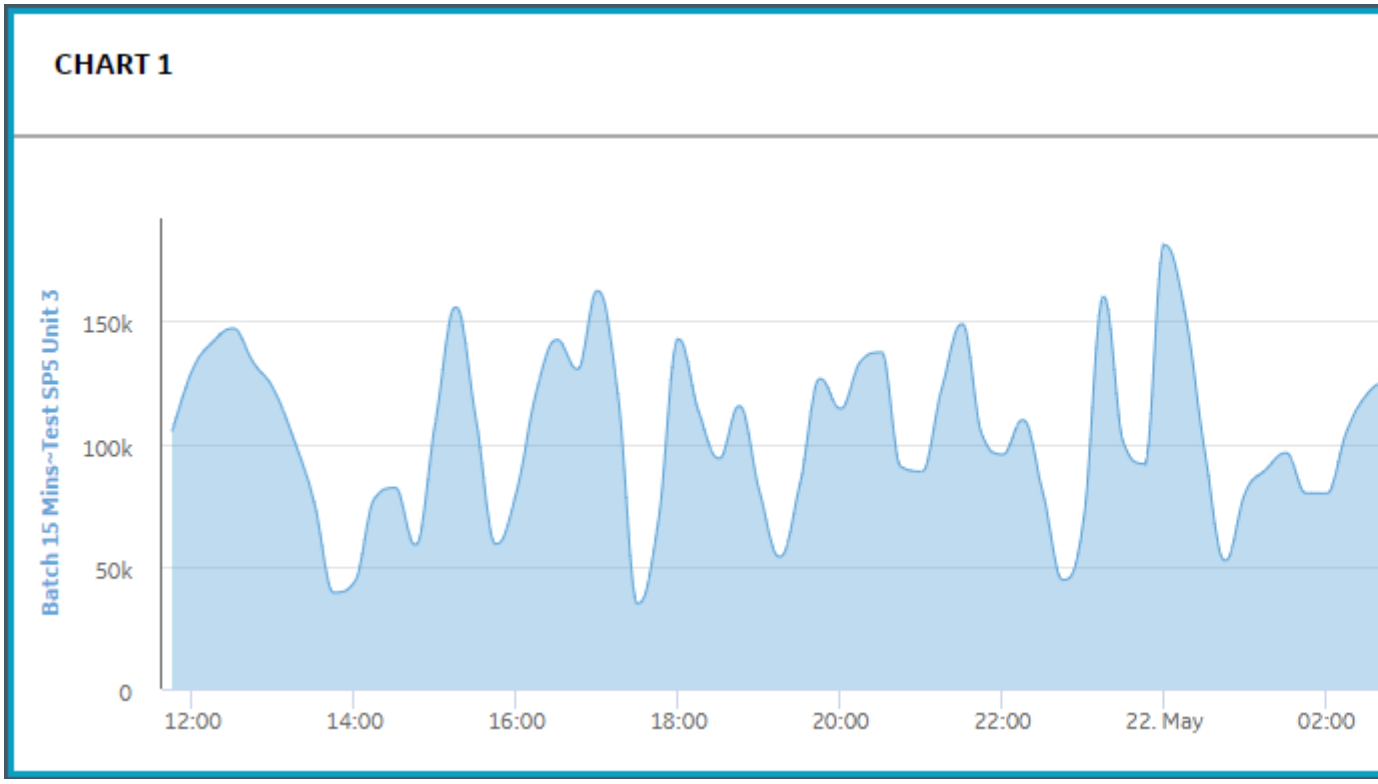


Figure 9: Area Smoothed Chart

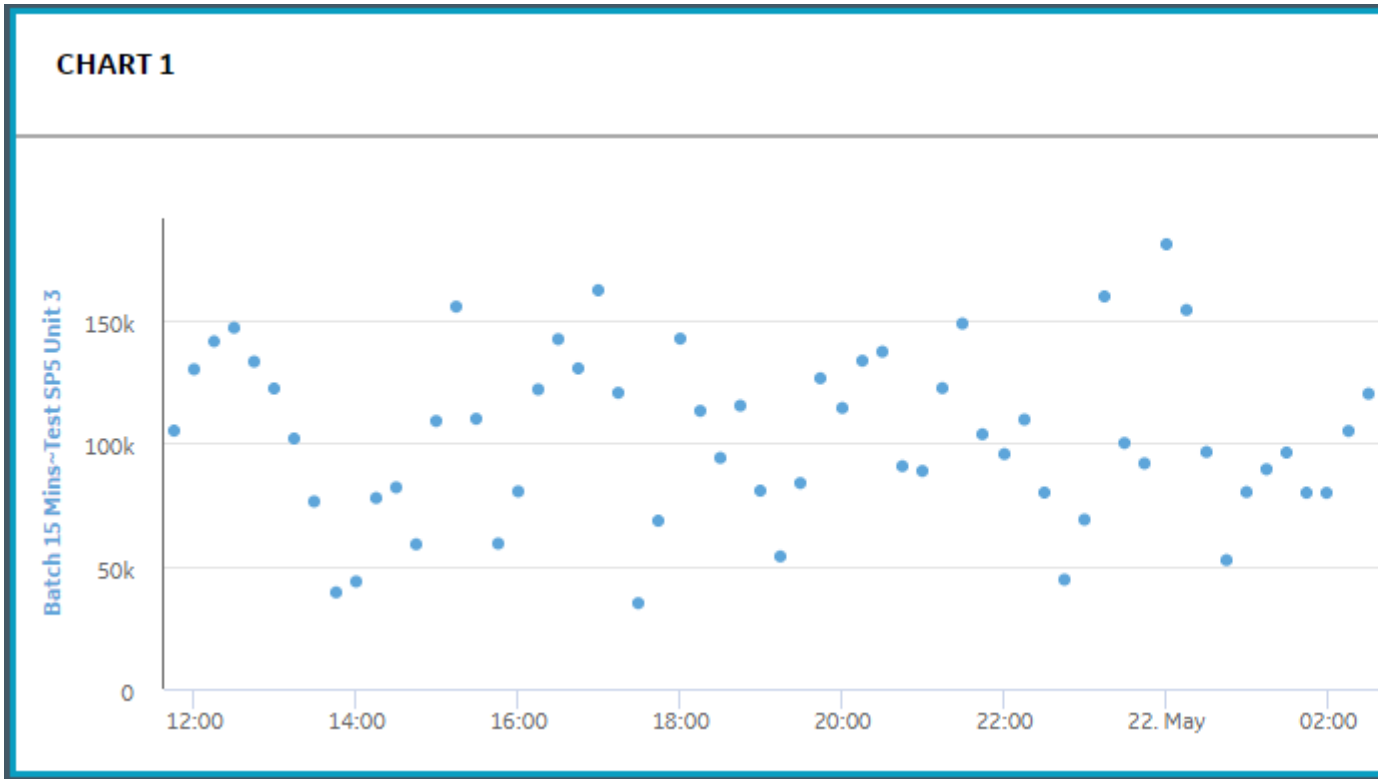


Figure 10: Scatter Chart

Save an Analysis Trend

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Chart Configuration** page appears.
3. Select a plant model and data type for which you want to view the trend chart.
4. Depending on the data type, select **Add Chart** or **Add Batches**, and then select **Plot**.
5. Select  .
   The **Save Trends** window appears.
6. In the **Title** box, enter a descriptive name for the chart.
7. Select **Save**.
   The current analysis view is saved as an analysis trend and is accessible by all users.

   Tip: To restore or delete the saved trend, select  in the **Chart Configuration** page. For more information, refer to the Restore a Saved Trend on page 137 and Delete a Saved Trend on page 137 topics.

Restore a Saved Trend

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Chart Configuration** page appears.
3. Select  .
   The **Restore Trends** window appears.
4. In the saved trends list, select the trend that you want to restore.
5. Select **Restore**.
   The saved trend is restored as an analysis view.

Delete a Saved Trend

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Chart Configuration** page appears.
3. Select  .

The **Restore Trends** window appears.

4. In the saved trends list, select the trend that you want to delete.
5. Select **Delete**.
   The **Delete Trend** window appears, asking you to confirm that you want to delete the selected trend.
6. Select **Yes**.
   The saved trend is deleted and is no longer accessible to any users.

Chapter 14

OEE Aggregation Store

Topics:

About OEE Aggregation Store

The OEE Aggregation Store is designed to improve the performance of the Downtime Supervisor Screens.

The OEE Aggregation Store calculates the OEE values every 60 minutes for production units and then having those values available in the database. This way OEE values do not have to be calculated on the fly every time a Downtime Supervisor screen is opened or refreshed.

The values are populated within the OEE Aggregation Store database table. The OEE Aggregation Store is managed by the following parameters:

Table 2: Populate

Value	Result
True	Enables the population of the OEE Aggregation tables and use of the tables on the Downtime Supervisor screens.
False	Disables the population of the OEE Aggregation tables and use of the tables on the Downtime Supervisor screens.

Table 3: OEE Refresh Intervals

Value	Result
1-24	Defines the number of hours worth of data to refresh. For example: The OEE Refresh Intervals value is set to 5. At 2 PM the OEE Aggregation store table is updated to show values for 2 PM, 1 PM, 12 PM, 11 AM, and 10 AM.

Note: The OEE Aggregation Store functionality only applies to the new Downtime Supervisor screens. It will not be leveraged in our existing Plant Applications Client or Plant Applications Web.

Chapter 15

Activities

Topics:

- Delete an Existing Comment for a Variable
- About Accessing a Custom Form
- About Custom Forms

About an Activity

As a supervisor or an operator, you can use the Activities application in the Plant Applications Universal Client to add and perform activities associated with an event in the specified duration of a shift. For each activity, you can add values for only the supported Autolog variables available in the Plant Applications Administrator. The Autolog variables are measurements or calculations attached to a given production line and product values based on an event or time. Each Autolog variable is associated with an event.

The data type defines the value entered for the Autolog variable in the Autolog sheet. When you perform an activity, you can analyze the data entered for a variable in the Quartile view or in a Whisker chart. The Activities application supports Autolog variables of the following data types.

Data type	Description
Integer	An array of integer numbers.
Float	An array of floating-point numbers.
Boolean	A logical entity that can have two values: true and false.
String	A sequence of up to 25 characters.
Comment	A comment variable.
Custom	A user-defined data type.

You can perform an activity for the following types of events:

- Time-based: A time-based event is a generic term for an event that occurs at the scheduled time.
- Production-based: A production-based event is a generic term for a lot or batch. It represents the output of a given production line.
- User-defined: A user-defined event (UDE) is a generic, manually recorded event used to document important occurrences related to process operations.
- Product change: A product change event occurs when there is a product change on a Production Unit.
- Process order change: A process order change event occurs when the process order for the associated Production Unit is set to Complete in the Plant Applications Administrator.

  Note: You cannot add a process order change event in the Activities application. You can only filter the activities associated with this event type.

For more information about the events and Autolog variables, refer to the Proficy Plant Applications Help.

You can categorize an activity as one of the types as described in the following table.

Type	Description
Open	All activities that are yet to be performed or completed, or are in progress, are categorized as open activities.
Completed	All activities that are completed or skipped are categorized as completed activities.

You can hover over an activity in the **Open** or **Completed** page to view the following information about the activity:

- **Time**: Displays the time stamp when the activity was created.
- **Product**: Displays the product associated with the activity.
- **Equipment**: Displays the equipment associated with the activity.
- **Process Order**: Displays the process order, if available, associated with the activity.

About Creating an Activity

When you add an event for a specific duration in the Plant Applications Universal Client, the activity for that event is automatically created in the Activities application. The time stamp of a time-based event and the start and end time of a production-based and user-defined event must be within two hours of the current date and time.

Note: You cannot add a Process Order Change event by using the Activities application. The activities for a Process Order Change event are automatically created in the Activities application when you complete the Process Order in the associated Display and the option to create activities is set to **True**. You configure the Display associated with a Production Unit in the Plant Applications Administrator.

For more information, refer to the following topics:

- Add a Time-Based Event on page 145
- Add a Production-Based Event on page 145
- Add a User-Defined Event on page 146
- Add a Product-Change Event on page 147

About the Plant Applications Administrator Settings

In the Plant Applications Administrator, you can group variables in a Display (the Autolog sheet) and add a title for each group of variables. You can also configure the Plant Applications Administrator to create activities corresponding to the titles of variable groups. In this case, the application creates as many activities as there are titles for variable groups in the selected Autolog sheet.

The activity created with an event appears in the **Open** page. For more information about accessing open activities, refer to the Access the Open Activities on page 147 topic.

The activities are not created in the following scenarios:

- When there are no variables configured in the Display associated with an Autolog sheet or a Production Unit and the Display type is not set to custom
- When the Display associated with an Autolog sheet or a Production Unit is configured to create activities with titles corresponding to the titles of variable groups, but the variable groups have the same title
- When the option to create activities is set to **False** in the Display associated with an Autolog sheet or a Production Unit

If the **System Complete Activity On New Event** option in the Plant Applications Administrator is enabled for the Display and you create an activity in the Plant Applications Universal Client whose product ID, process order ID, and unit ID match those of any existing activities, the existing activities are automatically set to complete. Depending on the number of such existing activities, the application might take some time to set all the activities as complete. You can then perform only the new activity that was last created.

In the Plant Applications Administrator, when the status of a production-based or user-defined event associated with the activity is set to a production status that has the **Lock Event Data** option enabled, then you do not have the privilege to modify the Autolog sheet for that event.

For more information about Plant Applications Administrator configurations for the Activities application, refer to the Proficy Plant Applications Help.

Add a Time-Based Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   By default, the **Open** page appears.
3. In the **Open** page, select  , and then select **Time Based Event**.

   The **Add Time Based Event** window appears, displaying a list of time-based Autolog sheets accessible to the logged-in user as configured in Plant Applications Administrator.
4. In the **1. Choose activity** section, select an activity to create a time-based event on the selected activity.
5. In the **2. Add Event Details** section, in the **TIMESTAMP** box, select a date and time.

   Note: The time stamp of the event must be within two hours from the current date and time.
6. **Optional:** In the **COMMENT** box, enter a comment for the event.
7. Select **Save**.

Results

The time-based event for the selected activity is added and an activity is automatically created for the event. The activity appears in the **Open** page.

Add a Production-Based Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   By default, the **Open** page appears.
3. In the **Open** page, select  , and then select **Production Based Event**.

   The **Add Production Event** window appears, displaying a list of production-based Autolog sheets accessible to the logged-in user as configured in the Plant Applications Administrator.
4. In the **Choose activity** section, select an activity to create a production-based event on the selected activity.
5. In the **2. Event Details** section, in the **EVENT NUMBER** box, enter an event number that is unique per unit.

   Note:

   If the string of the event number of the last added event has numeric values in it, then the application automatically increments the last numeric value by 1. The string with the incremented numeric value for the new event appears in the **EVENT NUMBER** box. You can retain or modify this value. For example, if the event number of the last added event is `PB79RQ89AP`, then when you add an event, the value `PB079RQ90AP` appears in the **EVENT NUMBER** box. Similarly, if the event number of the

last added event is `PB79RQ89AP1`, then for the new event, the value `PB79RQ89AP2` appears in the **EVENT NUMBER** box.

6. In the **DURATION** box, select a start and end time for the production-based event.

   Note: The start and end time of the event must be within two hours from the current date and time.
7. **Optional:** Specify values for the following optional properties: STATUS, APPLIED PRODUCT, and COMMENT.

   Note: When the status of a production-based event associated with the activity is set to a production status that has the **Lock Event Data** option enabled, you do not have the privilege to modify the Autolog variables for that event.
8. Select **Save**.

Results

The production-based event for the selected activity is added and an activity is automatically created for the event. The activity appears in the **Open** page.

Add a User-Defined Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   By default, the **Open** page appears.
3. In the **Open** page, select  , and then select **User Defined Event**.
   The **Add User Defined Event** window appears, displaying a list of user-defined Autolog sheets accessible to the logged-in user as configured in the Plant Applications Administrator.
4. In the **1. Choose activity** section, select an activity to create a user-defined event on the selected activity.
5. In the **2. Add Event Details** section, in the **EVENT NUMBER** box, enter an event number that is unique and not already added to the database.
6. In the **DURATION** box, select a start and end time for the production-based event.
7. **Optional:** Specify values for the following optional properties: STATUS, APPLIED PRODUCT, and COMMENT.

   Note: When the status of a user-defined event associated with the activity is set to a production status that has the **Lock Event Data** option enabled, you do not have the privilege to modify the Autolog sheet for that event.
8. In the **REASONS** box, select a reason to create a user-defined event.
9. Select **Save**.

Results

The user-defined event for the selected activity is added and an activity is automatically created for the event. The activity appears in the **Open** page.

Add a Product-Change Event

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .

   The **Open** page appears.
3. In the **Open** page, select , and then select **Product Change Event**.
   The **Add Product Change** window appears, displaying a list of Production Units on which you to want to make a new product. The Production Units that you can access are configured in the Plant Applications Administrator.
4. In the **1. Choose Activity** section, select a Production Unit to create a Product Change event on the selected Production Unit.
5. In the **2. Add Event Details** section, in the **PRODUCT GROUP** box, select the product group containing the product you want to make in the Production Unit.

   Tip: In the **PRODUCT GROUP** box, you can select **All Products** if you are not sure you about the product group.
6. In the **PRODUCT** box, select the product you want to make by using the selected Production Unit.
7. In the **TIMESTAMP** box, enter the date and time from when you want to initiate the product change event on the selected Production Unit.

   By default, the current date and time appears in the **TIMESTAMP** box. You can select the date and time by using the following options:

   - Select to select the date by using a calendar picker, or in the text box next to you can manually enter the date in the format yyyy/mm/dd (for example, 2018/11/21).
   - In the text box next to , enter the time in the format hh:mm:ss (for example, 5:03:44).
8. **Optional:** In the **PRODUCT CHANGE HISTORY** section, refer to a history of all product changes on the selected Production Unit with a time stamp when the product was changed was made.
9. Select **Save**.

Results

The product change event is created for the Production Unit in the Plant Applications Administrator. In the Plant Applications Administrator, if the option to create activities is enabled in the Display associated with the Production Unit, then the activity associated with the product change event appears in the **Open** page. You can then complete the activity in the Activities application.

Access the Open Activities

About This Task

To access the open activities, you must have the operator or supervisor role assigned to your user ID.

Procedure

1. Log in to the Plant Applications Universal Client.

2. Select .
   The **Open** page appears.

   By default, the option to automatically refresh activities in the **Open** page is disabled. You can switch the toggle to enable or disable the option to automatically refresh the page as described in the following table. After you select an option, your selection is saved.

Option	Description
	When this option is selected: • If  appears in the **Open** page, additional open activities are available in the shift. Select  to refresh the page and access all the open activities. • If  appears in the **Open** page, no additional open activities are available to access. • If  appears in the **Open** page, the RabbitMQ service is down.
	When this option is selected: • If  appears in the **Open** page, the manual refresh option is disabled. The page automatically refreshes when an additional open activity is available. • If  appears in the **Open** page, the RabbitMQ service is down.

You can select an option for an open activity as described in the following table.

Option	Action
Perform	Select this option to perform an activity and enter values for the Autolog variables for the associated event. The **Perform** option for an activity appears when the activity is yet to be performed. **Note:** If the option to lock activities is set to True in the Plant Applications Administrator, when you select **Perform** for an activity, the activity is locked and the **In Progress** option appears for the activity. Another operator cannot perform an activity until you release the activity.
In Progress	Select this option to perform an incomplete activity and enter values for the Autolog variables for the associated event. The **In Progress** option for an activity appears when the Status of the activity is not 100%.

Option	Action
Complete	Select this option to complete an activity. The **Complete** option for an activity appears when the Status of the activity is 100%. If there are no mandatory variables configured in the sheet (sampling Interval or test frequency not set to any variable), the **Complete** button is enabled even if the activity status is not 100% complete. **Note:** If the **Overdue Task Requires Comment** option is set to true in the Sheet display options and if the activity is overdue, then the **Overdue comment** window appears.
Skip	Select this option if you do not want to perform an activity. The **Skip** option for an activity appears when the activity is yet to be performed. When you select this option, a window used to enter skip comments appears.
Release	Select this option to release an activity that you are performing to let another user work on it or take over an activity while the first operator is still performing the activity. The **Release** option for an activity appears when the activity is yet to be completed.
	Select this option, and then select **Add Comment** to add a comment for the activity. If a comment already exists for an activity, select  , and then select **Add/Edit Comment** to add a general comment and access, modify, or delete a general or overdue comment. For more information, refer to the following topics: • Access Existing Comments for an Activity on page 164 • Add a General Comment for an Activity on page 164 • Modify an Existing General Comment for an Activity on page 165 • Modify an Existing Overdue Comment for an Activity on page 166 • Delete an Existing General Comment for an Activity on page 165 • Delete an Existing Overdue Comment for an Activity on page 167 **Note:** To modify or delete comments, your role must have appropriate rights configured in the Plant Applications Administrator.

Each field for an activity that appears in the **Open** page is described in the following table.

Field	Description
Activity	Displays the name of the activity. The default format for the activity name is configured in the Plant Applications Administrator.
Time Due	Displays the date and time when the activity is due for completion. The date and time is displayed in the format mm/dd hh:mm (for example, 03/27 10:58).

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>Due In</td><td>Displays the time in hh:mm:ss (for example, 02:00:21) until the activity is expected to be completed. If the activity is overdue, the time appears in red and within parentheses (for example, (02:00:21)). The value in this field is calculated using the formula:

Due In = Current Time - Time Due

Tip: Select the time in the Due In row for an overdue activity to enter an overdue comment. For more information, refer to the Add an Overdue Comment for an Activity on page 166 topic.</td></tr>
<tr><td>% Completed</td><td>Displays the completion status of the activity as a percentage.

The calculation of the completion status of the activity is based on criteria as described in the following table.

<table><tr><th>Criteria</th><th>Percentage Completion Calculation</th></tr><tr><td>• No sampling interval or test frequency set for variables associated with the time-based events
• No test frequency set for variables associated with the production-based or user-defined events</td><td>The ratio of the total variables for which you entered values to the total variables</td></tr><tr><td>• Sampling interval or test frequency is set for variables associated with the time-based events
• Test frequency is set for variables associated with the production-based or user-defined events</td><td>The ratio of the total variables with a test ID for which you entered values to the total variables with a test ID</td></tr></table>
The test IDs for variables are generated in the Plant Applications database.

In the Autolog sheet, the appearance of a box for entering a value depends on the following criteria:

• The box appears with a white background for variables with a test ID in the Plant Applications database.
• The box appears with a grey background for variables with no test ID in the Plant Applications database

The status is set to:

• 0%: If you have yet to perform the activity, enter values for any Autolog variables in the event associated with the activity, or no values exist for variables in the Plant Applications Administrator.
• 100%: If you enter values for all modifiable Autolog variables in the event associated with the activity.</td></tr>
<tr><td>Status</td><td>Displays the completion status of the activity such as Not Started, In Progress, Completed, System Completed, or Skipped.</td></tr>
<tr><td>User</td><td>Displays the ID of the user who is performing the activity.</td></tr>
<tr><td>Equipment</td><td>Displays the equipment type.</td></tr>
<tr><td>Event Type</td><td>Displays the event type.</td></tr>
<tr><td>Process Order</td><td>Displays the process order type.</td></tr>
<tr><td>Product</td><td>Displays the product types.</td></tr>
</table>

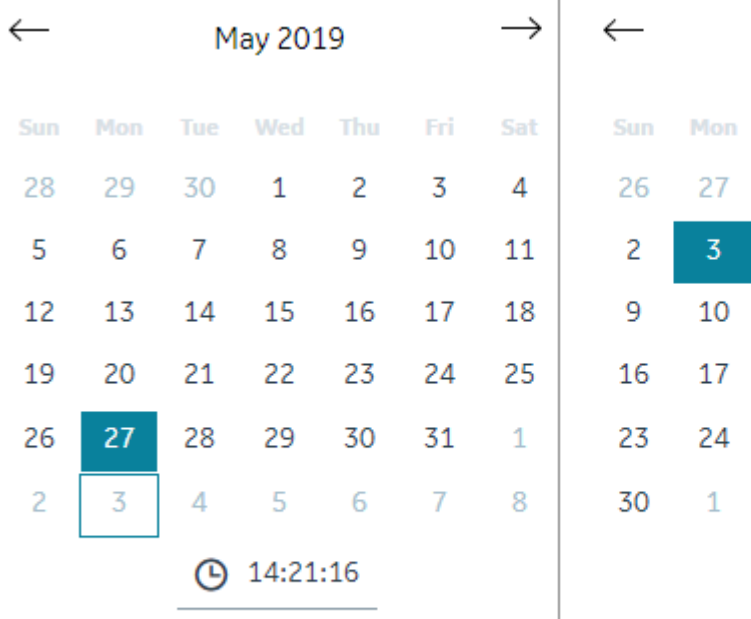
You can hover over an activity in the **Open** page, to access the following information about the activity:

- **Time**: Displays the time when the activity was created.
- **Product**: Displays the product associated with the activity.
- **Equipment**: Displays the equipment associated with the activity.
- **Process Order**: Displays the process order, if available, associated with the activity.

Note: If you select the **Completed** tab in the Activities application, and then select the **Open** tab, the selection of the **View by** box and the active page number are retained.

3. In the drop-down list box next to the **View by** box, select a time range as described in the following table.

Option	Description
Previous Day	Select to access all open activities from the day prior to the current Production Day.
Current Day	Select to access all open activities from the start time until the end time of the current Production Day. If there are no shifts configured for the plant, this option is selected by default.
Current Shift	Select to access all open activities from the start time until the end time of the ongoing shift. If shifts are configured for the plant, this option is selected by default.
Previous Shift	Select to access all open activities from the shift prior to the current shift.

Option	Description
Last 7 days	Select to access all open activities within seven days prior to the current Production Day.
Custom	Select to access all open activities within a date and time range that you specify by using a calendar window. The following calendar window appears when you select the **Custom** option.  To specify a custom date and time range in the calendar window: a. In the **START DATETIME** section, select a date and enter a time in the format hh:mm:ss. b. In the **END DATETIME** section, select a date and enter a time in the format hh:mm:ss. Select **Apply**.

Note: The **Previous Shift** and **Current Shift** options appear only when shifts are defined for the display in the Plant Applications Administrator.

Access the Completed or Skipped Activities

About This Task

To access the completed or skipped activities, you must have the operator or supervisor role assigned to your user ID.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .

The **Open** page appears.

3. Select the **Completed** tab to access all the activities that were completed or skipped.

   By default, the option to automatically refresh activities in the **Completed** page is disabled. You can switch the toggle to enable or disable the option to automatically refresh the page as described in the following table. After you select an option, your selection is saved.

Option	Description
	When this option is selected: • If  appears in the **Open** page, additional completed or skipped activities are available in the shift. Select  to refresh the page and access all the completed or skipped activities. • If  appears in the **Completed** page, no additional completed or skipped activities are available to access. • If  appears in the **Completed** page, the RabbitMQ service is down.
	When this option is selected: • If  appears in the **Completed** page, the manual refresh option is disabled. The page automatically refreshes when an additional completed or skipped activity is available. • If  appears in the **Completed** page, the RabbitMQ service is down.

In the **Completed** page, you can select  , and then select **Add Comment** to add a comment for the activity. If a comment already exists for an activity, select  , and then select **Add/Edit Comment** to add a General comment and access, modify, or delete a general, overdue, or skip comment. For more information, refer to the following topics:

- Access Existing Comments for an Activity on page 164
- Add a General Comment for an Activity on page 164
- Modify an Existing General Comment for an Activity on page 165
- Modify an Existing Overdue Comment for an Activity on page 166
- Delete an Existing General Comment for an Activity on page 165
- Delete an Existing Overdue Comment for an Activity on page 167
- Skip an Activity on page 163

Note: To modify or delete comments, your role must have appropriate rights configured in the Plant Applications Administrator.

The following table describes all the fields for an activity that appear in the **Completed** page.

Field	Description
Activity	Displays the name of the activity. The default format for the activity name is in the Plant Applications Administrator.
Time Completed	Displays the date and time when the activity was completed. The date and time is displayed in the format mm/dd hh:mm (for example, 03/27 13:05).
Duration	Displays the time taken to complete the activity. The duration is displayed in the format hh:mm:ss (for example, 02:00:21).
% Complete	Displays the completion status of the activity as a percentage.
User	Displays the ID of the user who completed or skipped the activity.
Event Type	Displays the event type associated with the activity.
Equipment	Displays the equipment type.
Status	Displays the completion status of the activity as a percentage.
Process Order	Displays the process order type.
Product	Displays the product types.

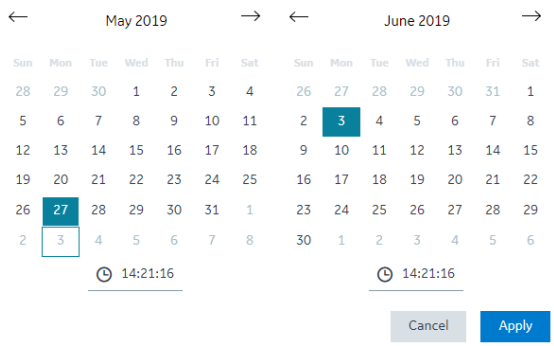
You can hover over an activity in the **Completed** page to access the following information about the activity:

- **Time**: Displays the time when the activity was created.
- **Product**: Displays the product associated with the activity.
- **Equipment**: Displays the equipment associated with the activity.
- **Process Order**: Displays the process order, if available, associated with the activity.

Note: If you select the **Open** tab in the Activities application, and then select the **Completed** tab, the selection of the **View by** box and the active page number are retained.

4. In the drop-down list box next to the **View by** box, select a time range as described in the following table.

Option	Description
Previous Day	Select to access all completed activities from the day prior to the current Production Day.
Current Day	Select to access all completed activities from the start time until the end time of the current Production Day. If there are no shifts configured for the plant, this option is selected by default.
Current Shift	Select to access all completed activities from the start time until the end time of the ongoing shift. If shifts are configured for the plant, this option is selected by default.
Previous Shift	Select to access all completed activities from the shift prior to the current shift.

Option	Description
Last 7 days	Select to access all completed activities within seven days prior to the current Production Day.
Custom	Select to access all completed activities within a date and time range of up to seven days that you specify by using a calendar window. The following calendar window appears when you select the **Custom** option.  To specify a custom date and time range in the calendar window: a. In the **START DATETIME** section, select a date and enter a time in the format hh:mm:ss. b. In the **END DATETIME** section, select a date and enter a time in the format hh:mm:ss. **Note:** The end date must be within seven days of the start date. c. Select **Apply**.

Note: The **Previous Shift** and **Current Shift** options appear only when shifts are defined for the display in the Plant Applications Administrator.

5. Select an activity to access the page displaying the Autolog history.

   In the page displaying the Autolog history, you can access the overall details of the event associated with an activity and a maximum of 20 historical values of Autolog variables entered for the event at different durations when the activity was scheduled. If an activity associated with an event was skipped, no values are displayed for the Autolog variables.

   The following table describes each field for an event that appears in the page displaying the Autolog history.

Field	Description
Event Name	Displays the unique ID of the event.
Date	Displays the current date and time in the format dd/mm/yyyy hh:mm:ss (for example, 27/03/2018 10:58:29).
Process Order	Displays the process order associated with the event.
Product	Displays the product associated with the process order.

   In the page displaying the Autolog history, you can select any of the three views based on the specifications:

   - **Data**: Displays only the Autolog variable details.
   - **Spec**: Displays only the Autolog variable box is colored according to the specification limits for the Autolog variable as configured in the Plant Applications Administrator.

- **Data & Spec**: Displays the Autolog variable details along with the background color according to the specification limits.

  Note: The background of an Autolog variable box is colored according to the specification limits for the Autolog variable as configured in the Plant Applications Administrator.

You can select **View Legend** to access all specification limits and the colors associated with them. The available specification limits are:

- **Reject**
- **Warning**
- **Target**
- **User**
- **Unavailable**

In the page displaying the Autolog history, you can select an Autolog variable to access information for that Autolog variable. If the specification limits for an Autolog variable are available, the following information appears:

- The lower and upper specification limits
- The specification limit associated with the variable based on the value entered for the variable
- The threshold value based on whether the entered value is higher or lower than the target value

Filter an Activity

About This Task

You can filter activities either in the **Open** or **Completed** page based on the filter applied to the selected columns. Select  appearing next to the column name and then select required filters from the menu to include in the list. You also can drag a column to the column header to group the downtime events based on the column selected. criteria that you enter.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
3. Select the tab for which you want to apply a filter.
4. Select  appearing next to the column name.
5. As needed, select the applicable filter options, and then select **Apply**.

Results

The activities based on the specified filtered criteria appears.

To reset the filter options to their default setting, select  , select **Select All** from the filter options, and then select **Apply**.

Search for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
3. Select the tab for the type of the activity for which you want to search.
4. Select .
5. As needed, specify the search options within a specified start and end time.

   Tip: To search for an activity using a barcode, select for an option and scan for the barcode specific to the option. The application supports the barcodes of standards Code 39 and Code 128 only.

   Note: In iPad, you can use only in the Safari browser.
6. Select **Apply**.

Results

The activities that match the search criteria appear.

Tip: To clear results and perform new search, select **Reset** in the page.

Complete an Activity

About This Task

You can complete an activity that is still open by entering values for Autolog variables in the Autolog sheet that appears in the **Activity** section.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .

   The **Open** page appears.
3. Select **Perform** for the activity you want to complete.
   The **Activity** section appears in addition to a section displaying information about the activity.

   The fields in the section displaying information about the activity are described in the following table.

Field	Description
Date	Displays the date when you started to perform the activity. The locale settings of your computer determine the display format for the date.
Time	Displays the time on the specified date when you started to perform the activity. The locale settings of your computer determine the display format for the time.

Field	Description
Process Order	Displays the process order, if available, associated with the activity.
Product	Displays the product associated with the activity.

In the **Activity** section, the Autolog sheet for the associated Display appears. You configure Display in the Plant Applications Administrator. If the Engineering Units property is enabled for the Display associated with the event, the units of measurement defined for variables also appear next to the variable value in the **Activity** section.

In the **Activity** section, the icons as described in the following table appear.

Icon	Description
	Select to display only variable names along with the aliasing name (if configured) and the associated specification limits. By default, this view is selected if any of the variable names in the list has the aliasing name configured.
	Select to statistically analyze an Autolog variable value in the Quartile view.
	Select to statistically analyze an Autolog variable value in a Whisker chart. By default, the Whisker chart appears in the pane in the Autolog sheet window.
	Select to access a custom form. **Note:** This icon appears only if you have configured the Display associated with the activity to enable a custom form to appear in the pane. In this case, by default, the custom form appears in the pane.
	Select to filter a variable associated with the activity. If you select this option, the **Variable Name** box appears. You can then enter the search text in the box, and then select **Apply** to filter a variable. All variables that match with any of the strings in the search text appear in the search results.
	

If the scroll type of the variables view is set to pagination, the variables view in the **Activity** section appears paginated according to the title of the variables group.

4. In the Autolog sheet, enter data for all modifiable Autolog variables.

   The application validates the entered values based on the data type, and, if configured in the Plant Applications Administrator, based on the Upper Entry and Lower Entry limits for the variables.

   Note:

   You can enter values for Autolog variables available in the Plant Applications Administrator only. Depending on the following configurations in the Plant Applications Administrator, you can enter values for the modifiable variables:

   - When the status of a production-based or user-defined event associated with the activity is set to a production status that has the **Lock Event Data** option enabled, you do not have the privilege to modify the Autolog sheet for that event.

- When the display associated with the activity has the **LockUnavailableCells** display option enabled, the only users who are members of the Administrator Security Group with an Access Level other than Read can enter values for the modifiable Autolog variables that have no available data.

5. Press Tab to save the value.

   Whether you enter the value in the Display associated with the Autolog sheet in the Plant Applications Administrator or in the window displaying the Autolog sheet in the Activities application, the last entered variable value is updated automatically in the Autolog sheet.

6. Select **Back**.

   The behavior of the **Open** page and the percentage completion of the activity is based on the criteria and the **Auto Complete Display** display option as described in the following table. You set the **Auto Complete Display** display option for the Display associated with the activity in the Plant Applications Administrator.

Criteria	Auto Complete Display Option Value	Behavior	Percentage Completion Calculation
• No sampling interval or test frequency set for variables associated with the time-based events • No test frequency set for variables associated with the production-based or user-defined events	False	The **Complete** option appears for that activity. You can then select the **Complete** option to complete the activity. The activity then appears in the **Completed** page.	The ratio of the total variables for which you entered values to the total variables.
• No sampling interval or test frequency set for variables associated with the time-based events • No test frequency set for variables associated with the production-based or user-defined events	True	If you enter values for: • Only a few selected Autolog variables in an activity, the **Complete** option appears for that activity. You can select **Complete** to complete the activity. The activity then appears in the **Completed** page. • All modifiable Autolog variables in an activity, the activity is automatically completed and appears in the **Completed** page.	The ratio of the total variables for which you entered values to the total variables.

Criteria	Auto Complete Display Option Value	Behavior	Percentage Completion Calculation
• Sampling interval or test frequency is set for variables associated with the time-based events • Test frequency is set for variables associated with the production-based or user-defined events	False	If you enter values for: • Only a few selected modifiable Autolog variables in an activity, the **In Progress** option appears for that activity. You can select **In Progress**, and then enter values for the remaining modifiable Autolog variables. • All modifiable Autolog variables in an activity, the **Complete** option appears for that activity. You can then select the **Complete** option to complete the activity. The activity then appears in the **Completed** page.	The ratio of the total variables with a test ID for which you entered values to the total variables with a test ID.
• Sampling interval or test frequency is set for variables associated with the time-based events • Test frequency is set for variables associated with the production-based or user-defined events	True	If you enter values for: • Only a few selected modifiable Autolog variables in an activity, the **In Progress** option appears for that activity. You can select **In Progress**, and then enter values for the remaining modifiable Autolog variables • All applicable Autolog variables in an activity, the activity is automatically moved to the **Complete** page.	The ratio of the total variables with a test ID for which you entered values to the total variables with a test ID.

Note: If the activity is overdue and the option to enter overdue comments for an activity is required, the window for entering overdue comments appears. In the window for entering overdue comments, you must enter your comment about the overdue activity in the **ADD OVERDUE COMMENT** box, and then select **Save**.

7. **Optional:** Select  , and then select **Add Comment** to enter a comment for a modifiable variable. For more information, refer to the Add a Comment for a Variable on page 167 topic.

   Note:

   If comments already exist for a variable,  appears for the variable.

   In the **Open** page, an informational message appears, stating that the comment was successfully added.
8. Select the **Event** tab.

   Note: This step is applicable only when the activity is associated with a production-based or user-defined event.

   For an activity associated with a production-based event, the following table describes fields that appear in the **Event** section.

Field	Description
EVENT NUMBER	Displays the unique ID of the event. You can modify the value entered in this field.
START TIME	Displays the time when the production started for the event. You can modify the value entered in this field.
END TIME	Displays the time when the production stopped for the event. You can modify the value entered in this field.
EVENT STATUS	Displays the disposition status of the event. You can modify the value entered in this field.
PRODUCT	Displays the product associated with the event. You can modify the value entered in this field.
APPLIED PRODUCT	Displays the product actually associated with the event. You can modify the value entered in this field.
DIMENSION NAME	Displays the dimension of the event as configured in the Plant Applications Administrator. This field is non-modifiable.
UNITS	Displays the equipment that produced (or contains) the production-based event. You can modify the value entered in this field.
INITIAL	Displays the initial value of the dimension. The value in this field appears blank if you do not modify the dimension value. This field is non-modifiable.
FINAL	Displays the current value of the dimension. You can modify the value entered in this field.
ADD BATCH COMMENT	Displays the option to add a comment or modify or delete comments for the event. Depending on the security levels defined for your role, you can add, modify, or delete comments.

For an activity associated with a user-defined event, the following table describes fields that appear in the **Event** section.

Field	Description
EVENT NUMBER	Displays the unique ID of the event. You can modify the value entered in this field.
START TIME	Displays the time when you started the user-defined event. You can modify the value entered in this field.
END TIME	Displays the time when the you stopped the user-defined event. You can modify the value entered in this field.
L1	Displays the reason for creating the user-defined event. You can modify the value entered in this field. **Note:** You configure the reason tree for a user-defined event in the Plant Applications Administrator
L2, L3, L4	Display the subreasons, if available, associated with the reason entered for the user-defined event. You can modify the value entered in these fields.
ADD COMMENT	Displays the option to add a comment or modify or delete comments for the event. You can modify or delete only those comments that were added by you.

9. **Optional:** In the **Event** section, enter the required value in the modifiable fields, and then select **Save**.

   Note: The **Save** option is enabled only when you modify a value for a field.

Results

The activity is completed and appears in the **Complete** page.

Modify the Value of an Autolog Variable

About This Task

You can modify the value of an Autolog variable entered for a completed or skipped activity depending on the following configurations in the Plant Applications Administrator:

- When the status of a production-based or user-defined event associated with the activity is set to a production status that has the **Lock Event Data** option enabled, you do not have the privilege to modify the Autolog variables for that event.
- When the display associated with the activity has the **LockUnavailableCells** display option enabled, the users only in the Administrator security group with an Access Level other than Read can enter values for the modifiable Autolog variables that have no available data.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
3. Select the **Completed** tab.
4. Select the activity.

   Tip: In the **Completed**page, you can select  appearing next to the column name to filter activities, and then select the activity.

   The page displaying the Autolog history appears, displaying values for the modifiable Autolog variables. The last entered variable value appears automatically in the page, displaying the Autolog history irrespective of the application or page from which the value is modified.

   In the Plant Applications Administrator, if the Engineering Units display property is enabled for the display associated with the event, the units of measurement defined for variables also appear next to the variable value in the Autolog sheet.
5. Select the numeric value for the Autolog variable that you want to modify, and then select **EDIT**.

   The text box for entering the Autolog variable value is now modifiable.
6. In the text box for the Autolog variable value, delete the old value and enter a new value, and then press Tab to save the new value.
7. Select **Back**.

Results

The updated value for the Autolog variable appears in the page displaying the Autolog history.

In the page displaying the Autolog history, all the Completed and Skipped activities appear. If you modify the value of an Autolog variable later for a completed or skipped activity in the page displaying the Autolog history, the Status of the activity does not change. However, based on the values entered or deleted for Autolog variables in an activity, the percentage completion of the activity is updated accordingly in the **% Complete** box in the **Completed** page.

Release an Activity

About This Task

You can view the **Release** option for an activity only when the activity is yet to be completed. After you release an activity, you can perform or skip that activity.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
3. Select the **Open** tab.
4. For the activity you want to perform but it is yet to be completed, select **Release**.

Results

The activity is released and you can now perform or skip the released activity.

Skip an Activity

About This Task

You can skip an open activity based on your requirements.

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
3. Select the **Open** tab.

   You can select the **Skip** option for an activity only when the activity is yet to be performed.
4. For the activity you want to skip, select **Skip**.

   The window for entering skip comments appears.

   Note: If the activity is overdue and the option to enter overdue comments for an activity is required, the window for entering overdue comments appears. In the window for entering overdue comments, you must enter your comment about the overdue activity in the **ADD OVERDUE COMMENT** box, and then select **Save**. The window for entering for skip comments then appears.
5. In the **ADD SKIP COMMENT** box, enter your comment about skipping the activity.
   An informational message stating that the comment was successfully added appears in the **Open** page.

   Note: You can delete a skip comment added to a skipped activity in the **Completed** page. For more information, refer to the Access the Completed or Skipped Activities on page 152 topic.
6. Select **Save**.

Results

The activity is skipped and no longer appears in the **Open** page. You can view the activity in the **Completed** page.

Access Existing Comments for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Open** page appears.
3. Select the tab that includes the activity for which you want to access comments.
4. Select  for the activity, and then select **Add/Edit Comment**.
5. As needed, select or clear the **General**, **Overdue**, or **Skip** check boxes to filter the existing comments list by the selected options.

   The **General**, **Overdue**, or **Skip** check boxes appear for an activity only when the comment type corresponding to the box exists for the activity.

Results

You can access all the comments associated with the activity and perform actions on them.

Tip: If you are in the **ADD GENERAL COMMENT** box, then select **Show Comments** to access all existing comments entered for the activity.

Add a General Comment for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Open** page appears.
3. Select the tab that includes the activity for which you want to add a general comment.
4. Select  , and then select **Add Comment** for the activity.
   A window for entering comments appears.

   Note: If comments already exist for an activity, select  , and then select **Add/Edit Comment** to access the window for entering comments.
5. In the **ADD GENERAL COMMENT** box, enter a comment for the activity, and then select **Save**.

   Tip: Select **Show Comments** to access all existing comments entered for the activity.

   An informational message stating that the comment was successfully added appears in the **Open** page.

Results

The general comment is added for the activity. In the existing comments list in the window for entering comments, the most recently added comment appears last. The information about the user who added the comment, the type of comment, and time stamp when the comment was added also appear for the comment.

Modify an Existing General Comment for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Open** page appears.
3. Select the tab that includes the activity for which you want to modify an existing general comment.
4. Select , and then select **Add/Edit Comment** for the activity.
5. **Optional:** In the window for entering general comments, select the **General** check box to filter comments in the existing comments list by the general type.
   All general comments appear in the existing comments list in the window for entering comments.
6. Select for an existing general comment.
   The **EDIT GENERAL COMMENT** box appears, displaying the current comment.
7. Modify the comment, and then select **Save**.

   Note: The position of a comment in the comments list remains constant even if you modify the comment later.

   An informational message stating that the comment was successfully modified appears in the **Open** page.

Results

The changes to the general comment are saved.

Delete an Existing General Comment for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Open** page appears.
3. Select the tab that includes the activity for which you want to delete an existing general comment.
4. Select , and then select **Add/Edit Comment** for the activity.
5. **Optional:** In the window for entering general comments, select the **General** check box to filter comments in the existing comments list by the general type.
   All general comments appear in the existing comments list in the window for entering comments.
6. Select for an existing general comment.
   The **Confirm Delete** window appears.
7. Select **Yes** to complete the delete action.
   An informational message stating that the comment was successfully deleted appears in the **Open** page.

Results

The general comment is deleted for the activity.

Add an Overdue Comment for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Open** page appears.
3. Select the time in the **Due In** row for an overdue activity for which you want to add an overdue comment.

   Tip: Alternatively, you can select **Complete** for an overdue activity after entering values for all the modifiable variables. For more information, refer to the Complete an Activity on page 157 topic.

   A window for entering overdue comments appears.
4. In the **ADD OVERDUE COMMENT** box, enter a reason for the overdue comment, and then select **Save**.

Results

The overdue comment is added for the activity. In the comments list in the window for entering comments, the most recently added comment appears last. The information about the user who added the comment, the type of comment, and the time stamp when the comment was added also appear for the comment.

Modify an Existing Overdue Comment for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .
   The **Open** page appears.
3. Select the tab that includes the activity for which you want to modify the overdue comment.
4. Select  , and then select **Add/Edit Comment** for the activity.
   A list of all existing comments appears in the window for entering comments.

   Tip: Alternatively, for open activities, in the **Open** page, you can select the time in the **Due In** row for an overdue activity. All overdue comments appear in the list of comments in the window for entering comments. Skip step 5 if you use this navigation.
5. **Optional:** In the window for entering general comments, select the **Overdue** check box to filter comments in the existing comments list by the overdue type.
   All overdue comments appear in the existing comments list in the window for entering comments.
6. Select  for an existing overdue comment.
   The **EDIT OVERDUE COMMENT** box appears, displaying the current comment.
7. Modify the comment, and then select **Save**.

Results

The changes to the overdue comment are saved.

Note: The position of a comment in the comments list remains constant even if you modify the comment later.

Delete an Existing Overdue Comment for an Activity

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .
   The **Open** page appears.
3. Select the tab that includes the activity for which you want to delete the overdue comment.
4. Select , and then select **Add/Edit Comment** for the activity.
   A list of all existing comments appears in the window for entering comments.

   Tip: Alternatively, for open activities, in the **Open** page, you can select the time in the **Due In** row for an overdue activity. All overdue comments appear in the list of existing comments in the window for entering comments. Skip step 5 if you use this navigation.
5. **Optional:** In the window for entering general comments, select the **Overdue** check box to filter comments in the existing comments list by the overdue type.
   All overdue comments appear in the existing comments list in the window for entering comments.
6. Select for an existing overdue comment.
   The **Confirm Delete** window appears.
7. Select **Yes** to complete the delete action.

Results

The overdue comment is deleted for the activity.

Add a Comment for a Variable

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select .

   The **Open** page appears.
3. Depending on the status of an activity, select **Perform** or **In Progress** for the activity associated with the variable.
   The page for entering data for the modifiable variables appears.
4. Select , and then select **Add Comment** for a variable to add a comment.
   A window for entering comments for the selected variable appears.

   Note: If comments already exist for a variable, select , and then select **Add/Edit Comment** to access the window for entering comments.
5. In the **ADD NEW COMMENT** box, enter a comment for the variable.
6. Select **Save**.

Results

The most recently added comment appears last in the comments list in the window for entering comments. The information about the user who added the comment and time stamp when the comment was added also appears for the comment.

Tip: If you are in the **ADD NEW COMMENT** box, then select **Show Comments** to access all existing comments entered for the variable.

Modify an Existing Comment for a Variable

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Open** page appears.
3. Depending on the status of an activity, select **Perform** or **In Progress** for the activity associated with the variable.
   The page for entering data for the modifiable variables appears.
4. Select  , and then select **Add/Edit Comment** for a variable.
   A comments list in the window for entering comments for the selected variable appears.
5. Select  for an existing comment.
   The **EDIT COMMENT** box appears, displaying the current comment.
6. Modify the comment, and then select **Save**.

Results

Note: The position of a comment in the comments list remains constant even if you modify the comment later.

The changes to the variable comment are saved.

Delete an Existing Comment for a Variable

Procedure

1. Log in to the Plant Applications Universal Client.
2. Select  .

   The **Open** page appears.
3. Depending on the status of an activity, select **Perform** or **In Progress** for the activity associated with the variable.
   The page for entering data for the modifiable variables appears.
4. Select  , and then select **Add/Edit Comment** for a variable.
   A comments list in the window for entering comments for the selected variable appears.
5. Select  for an existing comment.
   The **Confirm Delete** window appears.

6. Select **Yes** to complete the delete action.

Results

The comment is deleted for the variable.

About Accessing a Custom Form

You can access a custom form for an activity in the Activities application. The custom form must be embedded in an external URL.

You must configure the Plant Applications Administrator to enable the use of custom forms for the display associated with the autolog sheet. For more information, refer to the Proficy Plant Applications Help.

To access the custom form and complete the associated activity, in the **Activities** page, select **Perform** for a new activity or **In Progress** for an ongoing activity. For more information, refer to the Complete an Activity on page 157 topic.

Depending on the Plant Application Administrator configurations for the display associated with the autolog sheet, you can access a custom form in the following UI areas:

- As a page: The URL of the custom form opens in a separate page.
- Embedded within the window displaying the autolog sheet: The custom form appears in an embedded pane in the window displaying the autolog sheet.

  Note: To view the custom form, in the window displaying the autolog sheet, select  .
- As a replacement of the window displaying the autolog sheet: The custom form replaces the window displaying autolog sheet.

About Custom Forms

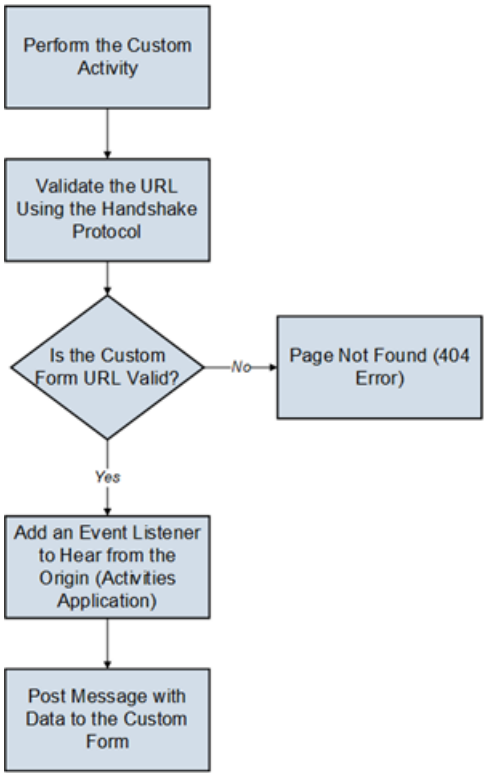
You can build and use your own custom forms in the Activities application. To associate a custom form with the Activities application, you must complete the following requirements in the Plant Applications Administrator:

- Configure the URL of the custom form.
- Configure the Autolog sheets to generate custom form driven activities.
- Configure the user name and password for the user authentication of the custom form.

For more information, refer to the Proficy Plant Applications Help.

Data Flow

When you perform custom activities, you are redirected to the custom activity URL. In addition to the external URL, some additional information is sent as a POST MESSAGE that is a part of HTML5 Web Messaging specification. The following data flow diagram describes the interaction between the Activities application and the custom form to establish the connection and send data.



The following procedure is described in the data flow diagram:

1. The user performs a custom activity in the Activities application.
2. The Activities application initiates the Handshake protocol by sending a message to the form and checks whether the URL of the custom form is valid or not.
    - If the URL is valid, the Activities application receives the message back. The application then adds an event listener to hear from the origin and then posts the message with the variable data to the custom form.
    - If the URL is not valid, a page not found 404 error message appears in the Activities application.

Post Data

The `window.postmessage()` method is used to send data from the Activities application to the custom form. The `window.postmessage()` method enables cross-origin communication between the following items:

- Window objects such as between a page and a window that the page spawned.
  Example: The `window.postmessage()` method is used when you select the option to access the URL of the custom in a separate page.
- A page and iframe such as between a page and an iframe embedded within the page.
  Example: The `window.postmessage()` method is used when you select the option to access the URL of the custom form embedded within the window displaying the autolog sheet or as a replacement of the window displaying the autolog sheet.

The arguments (also called as messages) passed to the `window.postMessage()` method are exposed to the receiving window through the event object. The Activities application creates an instance of target window to post message by using the following syntax:

```
targetWindow.postmessage(message, targetOrigin, [transfer]);
```

Where:

- `targetWindow`: A reference of the custom form window that receives the message.
- `message`: Data to be sent to the custom form. The data is serialized using the structured clone algorithm. The algorithm enables you to pass a broad variety of data objects safely to the destination window without serializing them.
- `targetOrigin`: The origin of target window. By default, asterisk (*) is set to indicate no preference. The `postMessage()` transmits vital information. It is absolutely critical that this argument be a URI whose origin is the same as the intended receiver of the message containing the password to prevent interception of the password by a malicious third party.
- `Transfer`: A sequence of transferable objects that are transferred with the message. An optional parameter not used in the Activities application.

Event Listener

An event listener is added by the Activities application when the custom form is loaded to receive the message coming from the Activities application as shown in the following code snippet.

```
window.addEventListener("message", receiveMessage, false);
function receiveMessage(event)
{
    if (event.origin !== "http://example.org:8080")
        return;
}
```

The properties of the dispatched message are:

- `data (event.data)`: The information passed by the Activities application.
- `origin`: The origin of the window that sent the message at the time `postMessage` was called. In the code snippet, the `http://example.org:8080` is an example of `origin`.
- `source`: A reference to the window object that sent the message. You can use this property to establish two-way communication between two windows with different origins.

Security Concerns

Remember the following security concerns when you use a custom activity:

- If you do not expect to receive messages from other sites, disable the Activities application to add any event listeners for message events.
- If you expect to receive messages from other sites, always verify the sender's identity using the `origin` and possibly source properties. Any window (including a URL, for example, `http://evil.example.com`) can send a message to any other window, and an unknown sender can send malicious messages. You must verify the syntax of the received message.

  Note: Failure to check the `origin` and possibly `source` properties enables cross-site scripting attacks.
- Always specify an exact target origin, not an asterisk (*) in the Activities application configuration when you use `postMessage` to send data to other windows. A malicious site can change the location

of the window without your knowledge. Therefore, the site can intercept the data sent using `postMessage`.

Data Sent to a Custom Form

The data sent to custom form in the `event.Data` object is in the JavaScript Object Notation (JSON) format. The following code sample shows the data sent to a custom form and the syntax to access the data.

```
{
                "loggedUserInfo": {
                    "token": <<token>>
                },
                "header": {
                    "activityId": <<activityId>>,
                    "activityType": <<activityType>>,
                    "activityDescription": <<activityName>>,
                    "startTime": <<startTime>>
                },
                "productInfo": <<productId>>,
                "processOrderInfo": <<processOrder>>,
                "variableInfo": <<variable_data>>,
                "activityStatusInfo": {
                    "statusId": <<Activity_statusId>>,
                    "status": <<Activity_status>>,
                    "readOnly": <<readOnly_status>>
                },
                "userConfigurationDetails": <<customActivityUser>>
            }
```

- `loggedUserInfo`: Provides the user name and token. The UAA token is required when the custom forms use the public REST APIs provided to save variables into SOADB.
- `Header`: Provides the activity ID, activity type as Production, Time-Based, or User-Defined, activity description, and start time of the activity.
- `ProductInfo`: Provides the ID, name, and value of the product.
- `ProcessOrderInfo`: Provides the ID, name, and value of the process order.
- `Variables`: Provides the list of variables with ID, name, data type, and value.
- `ActivityStatusInfo`: Provides information regarding whether the activity is locked, read-only state, or modifiable.
- `userConfigurationDetails`: Provides the user name and password configured in Plant Applications.

Data Size

As a data point, the WebKit implementation (used by Safari and Chrome) does not currently enforce any limits regarding the size of the data sent through a message.

The following domains were tested for use of the custom form:

- Same domain: successful (same IP address)
- Cross domain: successful (with different IPs and ports, messages transfer between http and https)

The transmission process of data has the following limitations:

- Data cannot be transmitted using form headers, form body, or query parameters by using `postmessage`.

- All data is transmitted through `postmessage` only.

Chapter 16

Alarm Notifications

Topics:

About an Alarm Event Notification

An alarm event occurs when a variable violates an alarm condition based on alarm rules configured for the variable specification limits, such as a reject or warning limit. You configure the alarm rules for a variable in the Plant Applications Administrator. The alarm events are added for any production-based, time-based, or user-defined events that include the variable for which you configured the alarm rule. The variable corresponding to the equipment selected appears in the **My Machines** page.

Note: Only users with their user roles included in the Security Group assigned to the Alarm Display can access the alarm notifications. You assign the Alarm Display to a Security Group in the Plant Applications Administrator.

Note: The Alarm Icon  appears on the application only when **enableAlarm** property is set to true in **localconfig.json** file in Apphub. It is set to true by default.

Alarm Conditions

Alarm conditions are based on alarm rules that compare data to product-based specification limits in real time. They are used to set alarms on critical variables where acknowledgement of a violation is required. Alarms capture key events that require an immediate action from an operator. You can also enter the cause reasons and the corrective actions based on the alarm condition.

Access Alarm Notifications

You can access alarm notifications in the following ways in the Plant Applications Universal Client:

- Float alarm notification: Appears for a short duration in the main navigation bar in the Plant Applications Universal Client. These notifications appear only when an alarm event is created for a variable and the **Notifications** pane is not already displayed. You can select **Show more** in the float alarm notification window to access the **Notifications** pane. A Float alarm notification appears in the main navigation bar in the Plant Applications Universal Client for the duration of time set in the **Dismiss Float Alarm Notification in** of **Settings** pane.

  Note: In the Activities application, you enter or modify the value of an Autolog variable value for an activity in the window displaying the Autolog sheet. If you refresh an application page and an alarm is triggered when the page is being refreshed, the float alarm notification for that alarm condition does not appear. Instead, the alarm notification appears in the **Notifications** pane only.

- **Notifications** pane: Appears when you select  in the Plant Applications Universal Client. The pane lists all the new and modified unacknowledged alarms associated with a variable. In the **Notifications** pane, you can directly acknowledge a notification, or enter the cause and action reasons using the **Perform** button in the notification, and then acknowledge a notification. For more information, refer to the Acknowledge an Alarm Notification on page 176 topic.

  Note: To acknowledge a notification, your role must have appropriate rights configured in the Plant Applications Administrator.

  You can also manage settings for the alarm notifications that appear in the **Notifications** pane and float notifications. For more information, refer to the Configure Alarm Notification Settings on page 178 topic.

  After you acknowledge all alarms in the **Notifications** pane,  is replaced with  .

Plant Applications Administrator Settings for Alarms

To access alarms in the Activities application, you configure the following settings for an Autolog variable in the Plant Applications Administrator:

- Specification limits
- Alarm Template

  Note: You configure an Alarm Template in the **Administer Alarms** section in the Plant Applications Administrator.

To access notifications, you must assign the Alarm Display to a Security Group that includes your role in the Plant Applications Administrator. For more information, refer to the Proficy Plant Applications Help.

Acknowledge an Alarm Notification

About This Task

To acknowledge an alarm notification, your role must have appropriate rights configured in the Plant Applications Administrator. As an operator or supervisor, you can access the **Notifications** pane to acknowledge an alarm notification.

Procedure

1. Log in to the Plant Applications Universal Client.
2. In the main navigation bar, select  .
   The **Notifications** pane appears.

   The alarm notifications that appear in the **Notifications** pane are displayed based on the scenarios described in the following table.

Scenario	Alarm Notification Behavior
When the variable value violates an alarm condition for the first time.	• A new alarm event is added for the alarm condition and the notification for the alarm condition is added to the **Notifications** pane. • The time when the alarm was added appears in the Start field on in the format mm/dd, hh:mm:ss (for example, 11/21, 09:26:36). • The End field appears blank for the open alarm.
When the variable value is within the specification limits for all current and past events.	The alarm event is deleted for the alarm condition, and the alarm notification is removed from the **Notifications** pane.
When the variable value is modified to be within the specification limits for an event. However, any past or current events still include variable value violating the alarm condition.	The time when the variable value was modified to be within the specification limits for an event appears in the End field in the format mm/dd, hh:mm:ss (for example, 11/22, 09:20:30). The number of batches for which the alarm notification is still unacknowledged also appears.
When a closed alarm event is reopened because the variable value was modified to a value that violates the alarm condition.	• The closed alarm event is reopened for the alarm condition and the notification for the alarm condition appears in the **Notifications** pane. • The time when the alarm was added initially appears in the **Start time** option in the format mm/dd, hh:mm:ss (for example, 11/21, 09:26:36). • The **End time** option value appears blank for the open alarm.

   In the **Notifications** pane, the priority is indicated by the numeric color-coded indicators described in the following table.

Indicator	Description
	A high priority alarm.
	A medium priority alarm.
	A low priority alarm.

3. In a notification, select **Show More**.
   A detailed view of the notification appears, displaying a sparkline (a line chart without axes or coordinates) between the two dash lines that indicate upper and lower reject or warning limits of the variable value as configured in the alarm template. If there is a product change associated with the variable, the dash lines appear modified, indicating the upper and lower reject or warning limits of the variable value for the new product.

   By default, the sparkline plots a line graph based on the variable values trending four hours before and after the variable value on which the alarm was created. The actual variable value on which the alarm was triggered is indicated by a red dot.

   Note: You set the duration of the time range for the variable value in the `BorderDuration` site parameter for Alarms in the Plant Applications Administrator. By default, the value of the `BorderDuration` site parameter is set to 240 minutes.

   Tip: In the **Notifications** pane, select **Expand All** to access the detailed view of all notifications. You can then select **Collapse All** to go back to the summary view of all notifications.
4. Select **Perform** to enter cause and action reasons if configured in the Alarm Template in the Plant Applications Administrator.

   The **Perform** button appears only when the Alarm Template is configured to enter the cause and action reasons for acknowledging the alarm notification.

   The **Edit Alarm** window appears.
5. In the **CAUSE REASONS** section, select **Add reasons**, and then select a reason and associated subreasons, as applicable, for the cause of the alarm notification.

   Note: The values in this section are populated based on the cause reason tree you configure for the alarm in the Plant Applications Administrator.
6. In the **ADD COMMENTS** section, select **Add comment** to enter a new comment for the specified cause reason or to modify or delete any comments entered earlier for the alarm notification. You can delete or modify only those comments that were added by you.
7. In the **Edit Alarm** window, select the **Actions** tab.
8. In the **ACTIONS REASONS** section, select a corrective action for the cause of the alarm notification. The values in this section are populated based on the action reason tree you configure for the alarm in the Plant Applications Administrator.
9. In the **ADD COMMENTS** section, select **Add comment** to enter a new comment for the specified action reason or to modify or delete any comments entered earlier for the alarm notification. You can delete or modify only those comments that were added by you.
10. Select the **ACKNOWLEDGE** check box to acknowledge the notification.

Note: The **ACKNOWLEDGE** check box is enabled only when you have entered the appropriate cause and action reasons for the alarm notification.

Tip: Alternatively, you can skip this step and select **Acknowledge** for the alarm notification in the **Notifications** pane to acknowledge the notification later.

11. **Optional:** Select **Acknowledge All** in the **Notifications** pane to acknowledge all notifications at once.
    Only those alarm notifications for which your role has appropriate rights are acknowledged.

Results

The acknowledged notification is removed from the **Notifications** pane.

Configure Alarm Notification Settings

Procedure

1. Log in to the Plant Applications Universal Client.
2. In the main navigation bar, select  .
   The **Notifications** pane appears.
3. In the **Notifications** pane, select ⚙.
   The **Settings** pane appears.

   Tip: To navigate back to the **Notifications** pane, select  .

   In the **Settings** pane, you can configure the options as described in the following table.

Option	Description
Sort Notifications by	Select one of the following options to decide the order in which alarm notifications appear in the **Notifications** pane: • **Priority**: Select to access alarm notifications sorted by decreasing order of alarm priorities; that is, high priority alarms appear first, followed by medium priority alarms, and then low priority alarms. **Note:** You set priority of an alarm notification in the alarm template in the Plant Applications Administrator. • **Time Received**: Select to access alarm notifications sorted chronologically by the date (and time) when they were received; that is, any new alarm notification will appear first. **Note:** By default, the alarm notifications are sorted by time received.
View Alarms By	Select one of the following options to view alarms only in the selected time range option, product, or process order: • **Current Shift**: Select to access all alarm notifications associated with activities in the ongoing shift. **Note:** By default, this option is selected. • **Current and Previous Shift**: Select to access all alarm notifications associated with activities in the ongoing shift and from the shift prior to the current shift. • **Current Day**: Select to access all alarm notifications associated with activities on the current Production Day. **Note:** If shifts are not configured, this option is selected by default. • **Current and Previous Day**: Select to access all alarm notifications associated with activities on the current Production Day and from the day prior to the current Production Day. **Note:** The **Previous Shift** and **Current and Previous Shift** options appear only when shifts are defined for the Display in the Plant Applications Administrator.
Dismiss Float Alarm Notification in	Enter a duration in seconds after which the float alarms notifications disappear. **Note:** By default, the box value is set to 5 seconds.
Until I Close Manually	Select to close the float alarm notification window manually. **Note:** If you select this check box, the **Dismiss Float Alarm Notification in** is disabled.

Tip: To restore the default settings, select **Reset**.

4. Select **Save**.
   The notification settings are saved, and the **Notifications** pane appears again.

Results

The alarm notifications appear in the **Notifications** pane according to the settings you saved.