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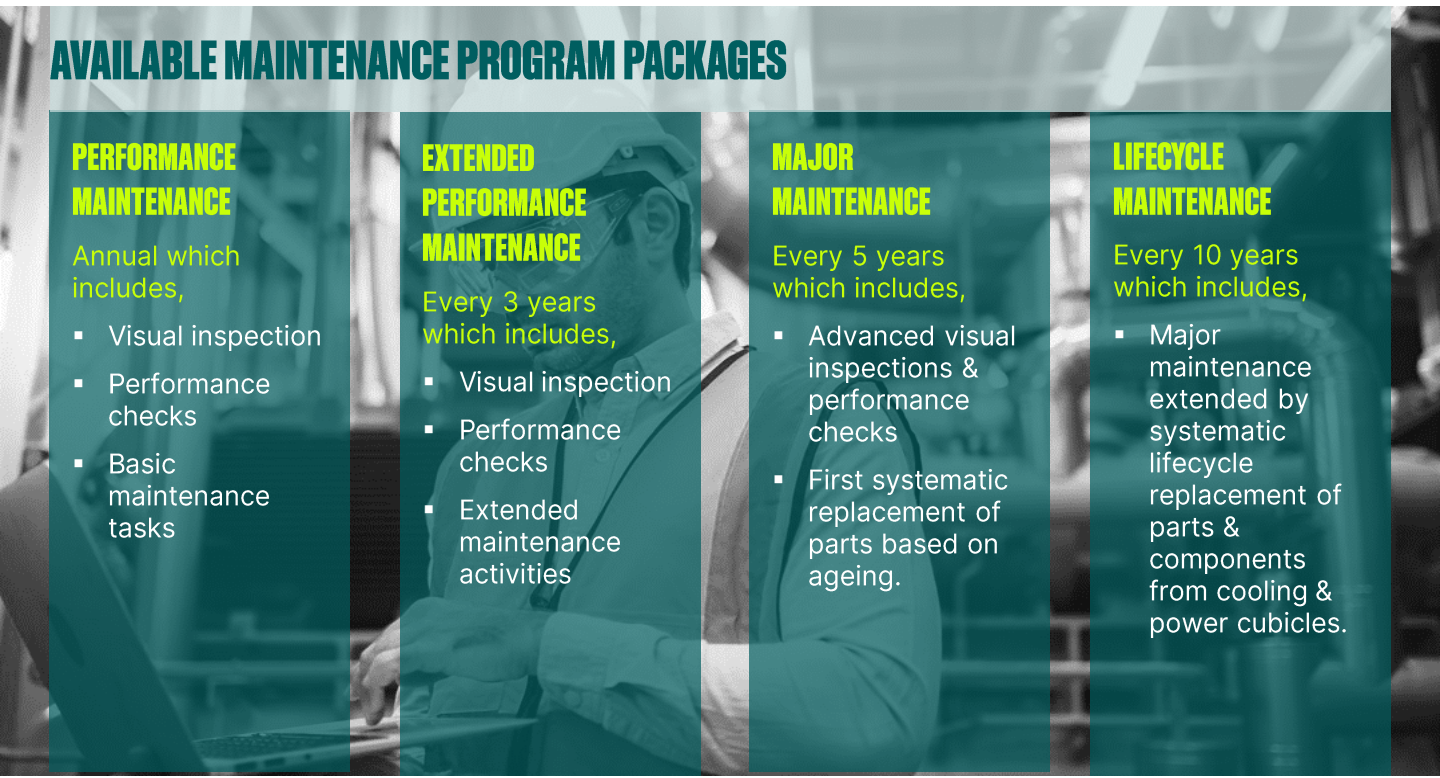
GENERAL MAINTENANCE OF SD7

Helps in reducing your maintenance cost and preventing unplanned outages

DO YOU HAVE SD7 AND THE BELOW QUESTIONS?

- Is it your goal to reduce your OPEX and unexpected breakdowns?
- Do you wish to increase the performance of your SD7 by understanding its status?
- Are you looking for replacement parts and optimized inventory?

Then, Plan your maintenance and choose it from Power Conversion's structured and comprehensive maintenance programs.



AVAILABLE MAINTENANCE PROGRAM PACKAGES

PERFORMANCE MAINTENANCE

Annual which includes,

- Visual inspection
- Performance checks
- Basic maintenance tasks

EXTENDED PERFORMANCE MAINTENANCE

Every 3 years which includes,

- Visual inspection
- Performance checks
- Extended maintenance activities

MAJOR MAINTENANCE

Every 5 years which includes,

- Advanced visual inspections & performance checks
- First systematic replacement of parts based on ageing.

LIFECYCLE MAINTENANCE

Every 10 years which includes,

- Major maintenance extended by systematic lifecycle replacement of parts & components from cooling & power cubicles.

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OUR MAINTENANCE PROCESS

Tailored to the needs of your plant – step by step

HOW DO WE DO IT?

1. Performing and recording preventive actions
2. Identifying safety critical and operational critical issues
3. Submitting reports with appropriate recommendations

Please refer the maintenance recommendations for SD7 from 125+ years old industry expert on the following pages

Step 1

- Drive inspection and health checks to assess the present condition of your drives.
- Air/water cooling system maintenance.
- Process cabinets & controller equipment maintenance.

Step 2

- Operational & safety critical issues identified will be brought to your attention with resolution.
- Prioritized dispatch of the required parts to attend the issue on safety critical scenarios.

Step 3

- Comprehensive report with recommendations for improved safety and better performance of your critical power equipment.

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MAINTENANCE CONFIGURATIONS 1/2

AIR COOLED	EVERY					
Operation description	1Y	3Y	5Y	10Y	15Y	20Y
Record drive document data with revision status and serial number	x					
Event logs & history retrieval						
Software version, date, status, storage with HTTP_infos	x					
General maintenance activities on all cubicles						
Visual check(leak, heating, wiring, corrosion)	x					
Visual inspection optical fiber	x					
Check operation of interlock system	x					
Cleaning door filter (change if required)	x					
Check fan operation (current measurement, insulation, noise, rotation)		x				
Change fan			x			
Check flap (operation, hinges)		x				
Check electrical connection	x					
Check heater operation	x					
Change water cooling hoses (Parker type)					x	
Control local converter (CLC)						
Check auxiliary power supply (current measurement)	x					
CPU battery replacement		x	x	x	x	
Clean electronic board	x					
Replace power supplies				x		
High Voltage cabinet						
Clean electronic board	x					
Power stack : check tightening with washer	x					
Check water pipe insulation		x	x	x	x	
Thyristors impedance measurement		x	x	x	x	
Thyristors RC snubbers measurement		x	x	x	x	
Check oil leakage on capacitor snubber		x	x	x	x	
Gate driver capacitor measurement (for electrical firing)		x	x	x	x	
Bridge NB,MB protections measurements (fuses, varistances) if appplicable		x	x	x	x	
Check smoth reactor PT100		x	x	x	x	
Pulses test on thyristors		x	x	x	x	

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MAINTENANCE CONFIGURATIONS 2/2

AIR COOLED	EVERY					
Operation description	1Y	3Y	5Y	10Y	15Y	20Y
Check Gate driver power supply (for electrical firing)		x	x	x	x	
Check good operation of gate driver power supply (for electrical firing)		x	x	x	x	
Check measurement loop by injection (NB, MB current, voltage)		x	x	x	x	
Replace air filter for PEC rack (if installaed)		x	x	x	x	
Converter insulation measurement			x	x	x	
Check attenuation of optical fiber			x	x	x	
Replace protections bridge (varistances, fuses) if applicable				x		
Replace capacitors snubbers					x	
Replace resistors snubbers technology RPS				x		
Replace sensors						x
Check and regrease earthing / isolating switch contact	x					
Premagnetisation contactor operation (if available)	x					

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MAINTENANCE CONFIGURATIONS 1/2

WATER COOLED	EVERY					
Operation description	1Y	3Y	5Y	10Y	15Y	20Y
Record drive document data with revision status and serial number	x					
Event logs & history retrieval						
Software version, date, status, storage with HTTP_infos	x					
General maintenance activities on all cubicles						
Visual check(leak, heating, wiring, corrosion)	x					
Visual inspection optical fiber	x					
Check operation of interlock system	x					
Cleaning door filter (change if required)	x					
Check fan operation (current measurement, insulation, noise, rotation)		x				
Change fan			x			
Check flap (operation, hinges)		x				
Check electrical connection	x					
Check heater operation	x					
Change water cooling hoses (Parker type)					x	
Control local converter (CLC)						
Check auxiliary power supply (current measurement)	x					
CPU battery replacement		x	x	x	x	
Clean electronic board	x					
Replace power supplies				x		
High Voltage cabinet						
Thyristors RC snubbers measurement	x					
Check oil leakage on capacitor snubber	x					
Gate driver capacitor measurement (for electrical firing)		x	x	x	x	
Bridge NB,MB protections measurements (fuses, varistances) if appplicable		x	x	x	x	
Check smoth reactor PT100		x	x	x	x	
Pulses test on thyristors		x	x	x	x	
Check Gate driver power supply (for electrical firing)		x	x	x	x	
Check good operation of gate driver power supply (for electrical firing)		x	x	x	x	
Check measurement loop by injection (NB, MB current, voltage)		x	x	x	x	
Replace air filter for PEC rack (if installaed)		x	x	x	x	
Converter insulation measurement		x	x	x	x	

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MAINTENANCE CONFIGURATIONS 2/2

WATER COOLED	EVERY					
Operation description	1Y	3Y	5Y	10Y	15Y	20Y
Check attenuation of optical fiber ???			x	x	x	
Replace protections bridge (varistances, fuses) if applicable				x		
Replace capacitors snubbers					x	
Replace resistors snubbers technology RPS				x		
Replace sensors						x
Check and regrease earthing / isolating switch contact	x					
Premagnetisation contactor operation (if available)	x					
Cooling unit (CCU)						
Check water connections are tightened	x					
Hangle of valve to prevent seizure			x	x	x	
Check sensor valuers (temperature, pressure, flow, conductivity)	x					
Clean water filter		x				
Check leakage detector	x					
Pumps functional check: current measurement, isolation, no noise		x				
Water cooling pump (1st and 2nd): Test of pump swap when low flow is detected. If redundant pump option		x	x	x	x	
Water analysis (external lab)	x	x	x	x	x	
Record pumps operating time	x					
Check the operation of the 3-way valve	x					
Check the setting of the three-way valve			x			
Expansion tank pressure control (inflate if required)	x					
Change expansion tank membrane			x			
Check solenoid valve control (if present in the cooling unit)			x			
Change the solenoid valve (if present in the cooling unit)			x			
Pressure test at 6 bars and check leakage			x	x		
Change deionized cartridge	x	x	x	x		
Replace deionized water pump			x	x	x	
Change deionized water when glycol (or equivalent) is used			x	x	x	
Change deionized water				x		
Change sensors					x	
Change deionized water pump			x			

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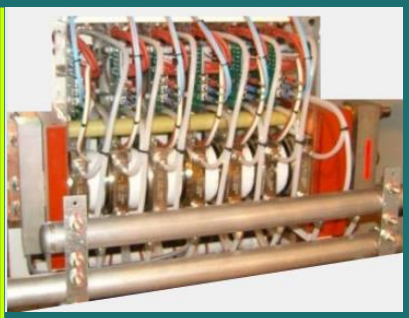
ADDITIONAL SUPPORT

We also recommend the following services for your benefits



Critical spare parts

List of critical spares will be suggested

- To manage your unexpected breakdowns efficiently.
- To optimize your inventory for spare parts.

Replacement parts*

A form-fit-function replacement suggestion

- Based on the performance of existing components of SD7 drives and lifecycle status replacement parts will be suggested.

Proactive performance enhancement packages**

- To stick with state-of-the-art protection and safety technologies
- To enhance the efficiency, performance and life-span

* Power Conversion offers a lifecycle management including ‘last time buy’ notifications to mitigate critical impacts and obsolescence risk.

** Power Conversion offers various smaller upgrades as a part of our proactive maintenance.

Contact us : services.powerconversion@ge.com