

T00073 Rev 1

Site Acceptance Test

ESS SO02839 CWS01 85kW Cooling Skid



Issue	Description	Author	Check	Date	Approved
0	Draft - not released	NVM	RMB	20JUN18	AJB
1	Released	NVM	RMB	22JUN18	AJB

Project information

Customer	European Spallation Source ESS
Project	CWS01 85kW Cooling Skid
Site	225 92 Lund, Sweden
GRE Reference	SO02839

Referenced Documents

ESS - 85kW Deionised Water Pump Skid P&ID	DOC-M01811
Electrical schematic ESS - 85kW Deionised Water Pump Skid	DOC-E00143
ESS - 85kW Deionised Water Pump Skid GA	DOC-M01887
Functional Design Specification	DOC-S00073

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1. Introduction

This system has been designed to reject 85kW when supplying circulating coolant deionised water at a maximum of 40°C in a maximum ambient temperature of 20°C and at a flow rate of 300Lpm at a design pressure of 10 barg.

The site testing / inspection of the equipment will be carried out at the ESS site situated in Lund, Sweden. The pump skid has been fully tested at GRE to confirm that the specified dimensions and operating parameters are met. This site test is to verify that everything is in place and working as specified for normal operation.

GRE will have carried out a very full and comprehensive test of all electrical functions.

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2. Pre-Test

2.1. Unit Identification

Sales Order Number		SO02839	Works Order Number		W010714
Model	CWS01/85kW	Condition good (visual inspection)			✓
Comments					
Completed by		G. Kingdon			
Date		26/06/18			
Signed					

2.2. Mechanical Components Visual Inspection

Condition Good (Visual Inspection). No weld defects. Welds purged with 99% Argon. Welds clean		✓ ✓ ✓
Comments		
Completed by		G. Kingdon
Date		26/06/18
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2.3. Electrical Components Visual Inspection

Electrical Connections Tight	✓
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Comments	
Completed By	G. Kingdon
Date	26/06/18
Signed	

2.4. Control Components Visual Inspection

Device	Model	Firmware	Software Revision
PLC	S71500	1.8	S00081R1
HMI	KTP900	13.0.1.0	S00081R1

Condition Good (Visual Inspection)		✓
Comments		
Completed By	G. Kingdon	
Date	26/06/18	
Signed		

3. System Setup

3.1. Filling Procedure

System to be filled once all safety tests passed. Before filling, ensure all drain valves are CLOSED. Process valves and bleeds (including pump air bleeds) are OPEN. Close Q106

Step	Instruction	Check
1	Connect DI water source to valve Q208. Open Q208.	✓
2	Fill with water, close air bleeds when water comes out of the air bleed.	✓
3	Close Q112 when water reaches Q129, Q101. Close Q129, Q101.	✓
4	Open Q126 (bypass valve)	✓
5	Run pump G101 for 30 seconds in manual mode from HMI, repeat pump G102.	✓
6	Ensure pumps are stopped, open Q129, Q101. Open Q112 until water comes out of Q129, Q101. Close Q129, Q101, Q112	✓
7	Repeat steps 5 and 6 until system is free of air. Using all air bleeds.	✓
8	Disconnect DI water source at Q112	✓
Comments Q124 and Q101 – remained closed		
Completed by	G. Kingdon	
Date	26/06/18	
Signed		

3.2. Deionising Bottle Change / Flushing Procedure

System will be filled and running when changing a deionising bottle. This test procedure is for changing Deionising Bottle C104. The procedure can be adapted to change deionising bottles C105. The procedure must only be carried out on one deionising bottle at a time.

Step	Instruction	Check
1	Check water level PG105 or via HMI. Make a note of water level	✓
2	Close Q120 and Q121	✓
3	Drain water from DI system into a bucket, place bucket under Q223	✓
4	Open Q223 to drain water from DI bottle pipe work	✓
5	Close Q223	✓
6	Remove retaining strap from DI bottle	✓
7	Disconnect flexible pipes from deionising bottle C104	✓
8	Remove DI bottle	✓
9	Replace with new DI bottle	✓
10	Connect flexible pipes from deionising bottle C104	✓
11	Tighten retaining strap from DI bottle	✓
12	Open Q231	✓
13	Partly open Q120 to slowly fill C104 DI system. Air will bleed via Q231	✓
14	Flush water via Q231 to bucket, to clear all air in new DI bottle.	✓
15	Open Q120 fully	✓
16	Close Q231 when flushing is complete	✓
17	Open Q122 partly to slowly open the new DI bottle to the system.	✓
18	Watch the system Conductivity. If system Conductivity remains good, slowly open the new bottle fully to the system.	✓
19	Rebalance the flow between the two DI bottles if required.	✓
20	Check water level. Refill system to level in step 1 if required.	✓

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Comments

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G. Kingdon

Date

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3.3. Treatment skid Filter Element Change / Flushing Procedure

System will be filled and running when changing a filter element. This test procedure is for changing filter element HQ103. The procedure can be adapted to change filter elements HQ104. The procedure must only be carried out on one filter at a time.

Step	Instruction	Check
1	Check water level PG105 or via HMI. Make a note of water level	✓
2	Close Q120 and Q121	✓
3	Drain water from DI system into a bucket, place bucket under Q223	✓
4	Open Q223 to drain water from DI bottle pipe work	✓
5	Open Q231	✓
6	Close Q223 when all water is drain	✓
7	Remove filter housing with special tool.	✓
8	Remove and replace HQ103 filter element.	✓
9	Refit filter housing with special tool.	✓
10	Check Q223 is closed	✓
11	Open Q120. Air will bleed via Q231	✓
12	Flush filter housing via Q231 into a bucket. When the filter is flushed and water runs free of air Close Q231	✓
13	Slowly open Q121	✓
14	Check for leaks on the filter housing	✓
15	Observe flows of DI circuits via HMI, see KF112 and KF113, balance flows using Q122 and Q125 if required	✓
16	Check water level and system conductivity	✓

Comments

Completed by

G. Kingdon

Date

26/06/18

Signed



3.4. Base Pressure Setting Procedure

This is the procedure for setting the base pressure for the system. The base pressure is set by filling the top of the expansion vessels C101 with nitrogen gas. This procedure is carried out once the system is filled and degassed. All bleed/vent valves to be closed.

Step	Description	Check
1	Connect a drain hose to Q208	✓
2	Close valve Q106	✓
3	Open solenoid valve Q105 via HMI or manually via relay in control panel	✓
4	Fill system with deionised water Q112	✓
5	Top up system until fluid escapes through solenoid	✓
6	Close solenoid valve Q105	✓
7	Stop filling system	✓
8	Set nitrogen gas pressure regulator Q108 to 2 barg $\pm$ 0.2bar. See pressure via KF104	✓
9	Open valve Q106, open solenoid Q107 via HMI or manually via relay in control panel	✓
10	Open Q208, drain expansion vessel C101 to 70% fill $\pm$ 2% fill.	✓
11	Close Q208	✓

Condition Good (Visual Inspection)	✓
Comments	
Completed by	G. Kingdon
Date	26/06/18
Signed	

3.5. Set up Flow rate via Gate Valves

This is the procedure for setting the flow through the DI vessels and balancing both lines. The flow is controlled through gate valves Q119, Q122 and Q125. This procedure is carried out once the system is filled, base pressure set, pump running.

Step	Description	Check
1	Ensure all process valves are open	✓
2	Open fully Q122, Q125 and Q119	✓
3	Check flow meters KF112 and KF113 via HMI	✓
4	Close Q119 to give a flow of 22 Lpm total split between KF112 and KF113	✓
5	Use Q122 and Q125 to balance the flow to 11 Lpm on KF112 and KF113	✓
6	Record readings of KF112 and KF113	✓

Record the flow readings for the flow meters below.

Step	KF112	KF113
6	11 @200LPM, 12 @300LPM	11 @200LPM, 12 @300LPM

Condition Good (Visual Inspection)	✓
Comments	
Completed by	G. Kingdon
Date	26/06/18
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3.6. Set up Actuated Valve

This is the procedure for checking the actuated valve Q129 & M101.

Step	Description	Check
1	Ensure valves Q130, Q131 and Q133 are open	✓
2	Ensure all bleed/vent valves are closed	✓
3	Ensure primary water flow is present	✓
4	Change the setpoint lower than the current reading and observe Q132 slowly modulate open	✓
5	Record flow reading from KF116	✓
6	Change the setpoint higher than the current reading and observe Q132 slowly modulate closed	✓

Record the flow readings for the flow meters below.

Step	KF116
5	

Condition Good (Visual Inspection)	✓
Comments PID checked. All operating as required but at a very low load.	
Completed by	R.Booth
Date	26/06/18
Signed	

4. Confirmation of Pump Performance Curve (Only to be completed if required)

Energise pump **G101**. Electrically vary the speed / flow to give the following approximate values.
Use the figures gained to construct a curve superimposed upon the following fitted pump curve.
Tolerances of all estimated pump pressures and target flow rates within 6% of stated values.

Pump Delivered Pressure at stated Flow Rate			Estimated Pump Pressure	Target Flow Rate LPM	Flow Rate BP104
KF107 =	KF105 =	KF107 - KF105 =	9.1barg	144	
KF107 =	KF105 =	KF107 - KF105 =	8.6barg	216	
KF107 =	KF105 =	KF107 - KF105 =	8.4barg	240	
KF107 =	KF105 =	KF107 - KF105 =	7.8barg	282	
KF107 =	KF105 =	KF107 - KF105 =	7.1barg	312	
KF107 =	KF105 =	KF107 - KF105 =	6.6barg	336	
KF107 =	KF105 =	KF107 - KF105 =	6.0barg	360	
KF107 =	KF105 =	KF107 - KF105 =	5.6barg	372	
KF107 =	KF105 =	KF107 - KF105 =	5.0barg	384	

Energise pump **G102**. Electrically vary the speed / flow to give the following approximate values.
Use the figures gained to construct a curve superimposed upon the following fitted pump curve.
Tolerances of all estimated pump pressures and target flow rates within 6% of stated values.

Pump Delivered Pressure at stated Flow Rate			Estimated Pump Pressure	Target Flow Rate LPM	Flow Rate BP104
KF107 =	KF106 =	KF107 - KF105 =	9.1barg	144	
KF107 =	KF106 =	KF107 - KF105 =	8.6barg	216	
KF107 =	KF106 =	KF107 - KF105 =	8.4barg	240	
KF107 =	KF106 =	KF107 - KF105 =	7.8barg	282	
KF107 =	KF106 =	KF107 - KF105 =	7.1barg	312	
KF107 =	KF106 =	KF107 - KF105 =	6.6barg	336	
KF107 =	KF106 =	KF107 - KF105 =	6.0barg	360	
KF107 =	KF106 =	KF107 - KF105 =	5.6barg	372	
KF107 =	KF106 =	KF107 - KF105 =	5.0barg	384	

5. Function Check

5.1. Static Alarm Behaviour

Static Alarms to be tested with pumps G101, G102 stopped.

Alarm Code	Tag	Fault conditions to be manually simulated	Auto/Manual Reset	Stop Pump	Warning Disable Heat Load	Beacon Colour
AL201	PRR1	Phase Fail	Manual			✓
AL202	PSU1	DC Power Supply Fault	Manual			✓
AL203	VFD1	Pump 1 Inverter Fault	Manual			✓
AL204	F1	Pump 1 Overload	Manual			✓
AL205	TBC	Pump 1 Local Isolator Open	Auto after 5s			✓
AL206	VFD2	Pump 2 Inverter Fault	Manual			✓
AL207	F2	Pump 2 Overload	Manual			✓
AL208	TBC	Pump 2 Local Isolator Open	Auto after 5s			✓

Condition Good (Visual Inspection)	✓
Comments	
Completed by	G. Kingdon
Date	26/06/18
Signed	

7.1 Sensor Alarm Behaviour

Sensor Alarms to be tested with pumps G101, G102 stopped.

Alarm Code	Tag	Fault conditions to be manually simulated	Auto/ Manual Reset	Stop Pump	Warning Disable Heat Load	Beacon Colour
AL101	BP101	Process Circuit Inlet Filter - Differential Pressure Sensor Fault	Manual	G101 only G102 only		✓
AL102	BP104	Process Circuit Outlet Flow Orifice - Differential Pressure Sensor Fault	Manual			✓
AL103	KF101	Process Circuit Inlet Pressure Sensor Fault	Manual			✓
AL104	KF102	Process Circuit Inlet Temperature Sensor Fault	Manual			✓
AL105	KF103	Expansion Vessel Level Sensor Fault	Manual			✓
AL106	KF104	Nitrogen Pressure Post Reg Sensor Fault	Manual			✓
AL107	KF105	Pump 1 Base Pressure Sensor Fault	Manual			✓
AL108	KF106	Pump 2 Base Pressure Sensor Fault	Manual			✓
AL109	KF107	Process Circuit Outlet Pressure #1 Sensor Fault	Manual			✓
AL110	KF108	Process Circuit Outlet Pressure #2 Sensor Fault	Manual			✓
AL111	KF109	Process Circuit Outlet Temperature #1 Sensor Fault	Manual			✓
AL112	KF110	Process Circuit Outlet Temperature #2 Sensor Fault	Manual			✓
AL113	KF111	Process Circuit Inlet Conductivity Sensor Fault	Manual			✓
AL114	KF112	Treatment Circuit #1 Flow Sensor Fault	Manual			✓
AL115	KF113	Treatment Circuit #2 Flow Sensor Fault	Manual			✓
AL116	KF114	Primary Circuit Inlet Temperature Sensor Fault	Manual			✓
AL117	KF115	Primary Circuit Inlet Pressure Sensor Fault	Manual			✓
AL118	KF116	Primary Circuit Flow Sensor Fault	Manual			✓
AL119	KF117	Primary Circuit Outlet Temperature Sensor Fault	Manual			✓
AL120	KF118	Primary Circuit Outlet Pressure Sensor Fault	Manual			✓
AL121	M101	Actuated Valve Feedback Sensor Fault	Manual			✓
AL122	BQ101	Process Circuit Oxygen Content Sensor Fault	Manual			✓
AL126	KF109/10	Temperature Transducer Discrepancy Fault	Manual			✓
AL127	KF107/8	Pressure Transducer Discrepancy Fault	Manual			✓

5.2. Process Alarm Behaviour

Static Alarms to be tested with system filled, system bled, system base pressure set, and pumps G101, G102 running. When system is tripped, Customer's System is stopped instantaneously, pumps G101, G102 run for an additional 60 seconds.

Alarm Code	Tag	Fault conditions to be manually simulated	Auto/ Manual Reset	Stop Pump	Warning Disable Heat Load	Beacon Colour
AL301	KF101	Process Inlet Pressure Low Alarm	Auto after 15s			✓
AL302	KF101	Process Inlet Pressure Low Trip	Manual			✓
AL303	KF101	Process Inlet Pressure High Alarm	Auto after 15s			✓
AL304	KF101	Process Inlet Pressure High Trip	Manual			✓
AL305	KF107/8	Process Outlet Pressure Low Alarm	Auto after 15s			✓
AL306	KF107/8	Process Outlet Pressure Low Trip	Manual			✓
AL307	KF107/8	Process Outlet Pressure High Alarm	Auto after 15s			✓
AL308	KF107/8	Process Outlet Pressure High Trip	Manual			✓
AL309	KF115	Primary Inlet Pressure Low Alarm	Auto after 15s			✓
AL310	KF115	Primary Inlet Pressure Low Trip	Manual			✓
AL311	KF115	Primary Inlet Pressure High Alarm	Auto after 15s			✓
AL312	KF115	Primary Inlet Pressure High Trip	Manual			✓
AL313	KF118	Primary Outlet Pressure Low Alarm	Auto after 15s			✓
AL314	KF118	Primary Outlet Pressure Low Trip	Manual			✓
AL315	KF118	Primary Outlet Pressure High Alarm	Auto after 15s			✓
AL316	KF118	Primary Outlet Pressure High Trip	Manual			✓
AL317	KF105	Pump 1 Base Pressure Low Alarm	Auto after 15s			✓
AL318	KF105	Pump 1 Base Pressure Low Trip	Manual			✓
AL319	KF106	Pump 2 Base Pressure Low Alarm	Auto after 15s			✓

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AL320	KF106	Pump 2 Base Pressure Low Trip	Manual		✓
AL321	KF104	Nitrogen Pressure Low Alarm	Auto after 15s		✓
AL322	KF104	Nitrogen Pressure Low Trip	Manual		✓
AL323	KF104	Nitrogen Pressure High Alarm	Auto after 15s		✓
AL324	KF104	Nitrogen Pressure High Trip	Manual		✓
AL325	KF104	Nitrogen Bottle 1 Low Pressure	Manual		
AL326	KF104	Nitrogen Bottle 2 Low Pressure	Manual		
AL401	KF102	Process Inlet Temperature Low Alarm	Auto after 15s		✓
AL402	KF102	Process Inlet Temperature Low Trip	Manual		✓
AL403	KF102	Process Inlet Temperature High Alarm	Auto after 15s		✓
AL404	KF102	Process Inlet Temperature High Trip	Manual		✓
AL405		Temperature Setpoint Discrepancy Alarm	Auto after 15s		✓
AL406	KF109/10	Process Outlet Temperature Low Alarm	Auto after 15s		✓
AL407	KF109/10	Process Outlet Temperature Low Trip	Manual		✓
AL408	KF109/10	Process Outlet Temperature High Alarm	Auto after 15s		✓
AL409	KF109/10	Process Outlet Temperature High Trip	Manual		✓
AL410	KF114	Primary Inlet Temperature Low Alarm	Auto after 15s		✓
AL411	KF114	Primary Inlet Temperature Low Trip	Manual		✓
AL412	KF114	Primary Inlet Temperature High Alarm	Auto after 15s		✓
AL413	KF114	Primary Inlet Temperature High Trip	Manual		✓
AL414	KF117	Primary Outlet Temperature Low Alarm	Auto after 15s		✓
AL415	KF117	Primary Outlet Temperature Low Trip	Manual		✓
AL416	KF117	Primary Outlet Temperature High Alarm	Auto after 15s		✓
AL417	KF117	Primary Outlet Temperature High Trip	Manual		✓
AL501	KF111	High Conductivity - High Alarm	Auto after 15s		✓
AL502	KF111	High Conductivity - High Trip	Manual		✓

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AL601	BP104	Process Flow Low Alarm	Auto after 15s		✓
AL602	BP104	Process Flow Low Trip	Manual		✓
AL603	KF116	Primary Flow Low Alarm	Auto after 15s		✓
AL604	KF116	Primary Flow Low Trip	Manual		✓
AL605	BP101	Process Filter Blockage Alarm	Auto after 15s		✓
AL606	BP101	Process Filter Blockage Trip	Manual		✓
AL607	KF112	DI Bottle 1 Low Flow Alarm	Auto after 15s		✓
AL608	KF112	DI Bottle 1 Very Low Flow Alarm	Manual		✓
AL609	KF113	DI Bottle 2 Low Flow Alarm	Auto after 15s		✓
AL610	KF113	DI Bottle 2 Very Low Flow Alarm	Manual		✓
AL701	KF103	Expansion Vessel Low Alarm	Auto after 15s		✓
AL702	KF103	Expansion Vessel Low Trip	Manual		✓
AL703	KF103	Expansion Vessel High Alarm	Auto after 15s		✓
AL704	KF103	Expansion Vessel High Trip	Manual		✓
AL801	M101	Three way valve fault	Auto after 15s		✓
AL802	BQ101	Oxygen Concentration High Alarm	Auto after 15s		✓
AL803	BQ101	Oxygen Concentration High Trip	Manual		✓
AL901		Both Pumps in Fault	Auto after 15s		✓
AL902		Process Outlet Temperatures sensors KF109 & KF110 both in fault	Auto after 15s		✓
AL903		Process Outlet Pressure sensors KF107 & KF108 both in fault	Auto after 15s		✓
AL904		Both DI Bottles Fault	Auto after 15s		✓

5.3. Pump control Test

This test will verify the behaviour of the pump in the case of a fault. The following test will be carried out with the system running.

Step	Description	Check
1	Confirm the system is filled, air free, and all bleed/vent valves closed, and the base pressure is set.	✓
2	Confirm all main circuit valves open.	✓
3	Partially close Q115 until pump G101 base pressure KF105 drops below the very low alarm setpoint. Record the pressure at which the trip occurs.	✓
4	Confirm that AL318 is generated and that pump G101 stops and pump G102 starts	✓
5	Reopen Q115 and confirm the alarm can be reset	✓
6	Partially close Q117 until pump G102 base pressure KF106 drops below the very low alarm setpoint. Record the pressure at which the trip occurs.	✓
7	Confirm that AL320 is generated and that pump G102 stops and pump G101 starts	✓
8	Reopen Q117 and confirm the alarm can be reset	✓
9	Pull wire from sensor KF105 (pump G101 base pressure)	✓
10	Confirm that AL109 is generated and that pump G101 stops and pump G102 starts	✓
11	Remove the fault and confirm that AL109 clears after 15s	✓
12	Pull wire from sensor KF106 (pump G102 base pressure)	✓
13	Confirm that AL110 is generated and that pump G102 stops and pump G101 starts	✓
14	Remove the fault and confirm that AL110 clears after 15s	✓
15	With pump G101 running, simulate a pump G101 inverter fault	✓
16	Confirm that AL203 is generated and that pump G101 stops and pump G102 starts	✓
17	Remove the fault and confirm that AL203 can be reset	✓
18	With pump G102 running, simulate a pump G102 inverter fault	✓
19	Confirm that AL206 is generated and that pump G102 stops and pump G101 starts	✓
20	Remove the fault and confirm that AL206 can be reset	✓
21	With pump G101 running, simulate a pump G101 overcurrent fault	✓

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22	Confirm that AL204 is generated and that pump G101 stops and pump G102 starts	✓
23	Remove the fault and confirm that AL204 can be reset	✓
24	With pump G102 running, simulate a pump G102 overcurrent fault	✓
25	Confirm that AL207 is generated and that pump G102 stops and pump G101 starts	✓
26	Remove the fault and confirm that AL207 can be reset	✓
27	With pump G101 running, turn off pump G101 local isolator	✓
28	Confirm that AL205 is generated and that pump G101 stops and pump G102 starts	✓
29	Turn on the isolator and confirm that AL205 automatically resets after 15s	✓
30	With pump G102 running, turn off pump G101 local isolator	✓
31	Confirm that AL208 is generated and that pump G102 stops and pump G101 starts	✓
32	Turn on the isolator and confirm that AL208 automatically resets after 15s	✓

Record the pressure for the Power Supply Control Test below.

Step No.	KF105	KF106
3	0.2 Barg	
6		0.2 Barg

Condition Good (Visual Inspection)	✓
Comments	
Completed by	G. Kingdon
Date	26/06/18
Signed	

6. Normal Operational Checks

The only heat load will be the pumps. The following tests will only be carried out once all previous sections of this document have been completed and passed.

6.1. Expansion Vessels Level Monitoring, Control

This test procedure will verify the correct function of Expansion Vessels level monitoring devices (level indicator and switch KF103). The system will be filled, and the expansion vessels will be filled to 70%± 2%

Step	Description	Check
1	Top up system until high level alarm activated. Stop fill on alarm activation.	✓
2	Record water level on level device KF103.	✓
3	Drain system until low level alarm activated. Stop drain on alarm activation.	✓
4	Record water level on level device KF103.	✓
5	Close valves Q103 and Q104	✓
6	Drain expansion vessel C101 until level switch KF103 activated. Stop drain on switch activation.	✓
7	Record water level on level device KF103	✓
8	Open valves Q103 and Q104	✓
9	Top up system until expansion vessel C101 is filled to 70% (witness level at KF103)	✓

Record the water levels for the Expansion Vessels Level Monitoring, Control Test below.

Step No.	C101
2	677mm (75%)
4	270mm (30%)
7	220mm (25%)

Condition Good (Visual Inspection)	✓
Comments	
Completed by	G. Kingdon
Date	26/06/18

Signed



6.2. Nitrogen Gas Cap Vent / Refill

This test procedure will verify the correct venting and refilling of nitrogen gas cap in expansion vessel C101. The nitrogen gas cap is vented and filled automatically during normal operation, but a nitrogen gas cap vent can be manually initiated.

Step	Description	Check
1	Ensure system is running normally	✓
2	Observe base pressure on pressure transducers KF101	✓
3	Manually initiate nitrogen gas cap venting procedure (using HMI)	✓
4	Observe solenoid valve Q105	✓
5	Observe HMI screen for pressure drop of pressure transducer KF104	✓
6	Observe solenoid valve Q105 closing when Base Pressure Low Alarm is activated.	✓
7	Observe solenoid valve Q107 open	✓
8	Observe HMI screen for pressure increase of pressure transducer KF104	✓
9	Observe base pressure on pressure transducers KF101 return to pre-vent procedure values	✓

Condition Good (Visual Inspection)	✓
Comments	
Completed by	G. Kingdon
Date	26/06/18
Signed	

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7. Final Checks

Check overall condition of components, paintwork, and stainless steel (visual inspection)		✓	
Check that all electrical connections are tight		✓	
Check that all fluid connections are tight		✓	
Check that all valves are plugged (where applicable)		✓	
Check earth bonding and continuity appears to be intact		✓	
Take Pictures of unit and save in sales order folder		✓	
Comments			
Final inspection Completed By	R.Booth	Date	26/06/18
Signed			