Unitywater

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F8941 - PRV Commissioning Check Sheet

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Document Details

This document is only valid on the day it was printed.

Document Owner	Manager Capital Delivery
References	F8922 - PRV Commissioning Worksheet End to End Test Sheet

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General

In using this document, due consideration of all other relevant Unitywater Standard Drawings and Unitywater Standard Specifications should be adhered to.

Vendor Verification

PROJECT TITLE:			**FINANCE NO:**
General			**Result / Init. / Date**
Mechanical			
1. Valve test results have been reviewed and conform with applicable standards/specifications			OK ☐
2. Flowmeter Calibration certificate received			OK ☐
CONSTRUCTOR			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER SIGNOFF			
Name:	*Position:*	*Signature:*	*Date:*

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PROJECT TITLE:	FINANCE NO:
Factory Acceptance Testing (FAT)	**Result / Init. / Date**
Electrical, Instruments and Control (E, I & C)	
Switchboards	
1. The switchboard manufacturer has been provided with current Unitywater Standard Switchboard Drawings (OR, if "Design and Construct", the 'For Construction' drawings have been reviewed by Unitywater and provided to the switchboard manufacturer)	OK ☐
2. The switchboard manufacturer has undertaken a full point-to-point test on all switchboard wiring	OK ☐
3. The switchboard manufacturer has provided evidence of point-to-point testing in the form of marked up wiring drawings (each connection highlighted as tested)	OK ☐
4. Any changes, outcomes or additional detail resulting from FAT testing have been marked on the drawings with the highlighted test connections. Mark-ups include all available circuits, inputs, power supply voltages, labels, wire numbers, terminals etc. These marked-up drawings are labled 'FAT'.	OK ☐
5. Cabinet and paintwork have been inspected for any visual damage	OK ☐
6. The following is as per current drawings: • Incomer arrangements • Cable entry provisions • Interlocking provisions • Incomer protection (Fault current rating) and discrimination	OK ☐
7. Switchboard rating nameplate is attached	OK ☐
8. Switchboard Test Certificate has been checked	OK ☐
9. Software used during FAT is available	OK ☐
10. Any deficiencies have been recorded to a 'FAT punchlist register' and rectified	OK ☐
Instrumentation	
11. Calibration certificates have been received for instruments	OK ☐
Software	
12. Software for Outstation Type is loaded	OK ☐
13. Software blocks have been fat tested (if non standard)	OK ☐

CONSTRUCTOR			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER SIGNOFF			
Name:	*Position:*	*Signature:*	*Date:*

Pre-commissioning

PROJECT TITLE:	FINANCE NO:
Preliminaries Checklist	**Result / Init. / Date**
1. Check all commissioning personnel have been inducted to site	OK ☐
2. Check risk assessments and SWMS have been produced for all Pre-commissioning and Commissioning activities	OK ☐
3. The site is safe for commisisoning works to commence. Safety requirements include: • Covers and grills installed and flush • Davit mounting points certified • Fall arest mounting points certified • Handrails, fencing, gates and chains installed correctly • Emergency procedures available • Safety signage in place (PPE, Elecricity, SWL, Danger etc.)	OK ☐
4. Check “danger electric” marker bricks are installed at ground level and painted yellow where applicable	OK ☐
5. ‘As Constructed’ survey by licenced surveyor complete	OK ☐
6. Changes to any detail as shown on the ‘For Construction’ drawings noted on a set of ‘For Construction’ drawings and marked ‘As Constructed	OK ☐
7. Current Unitywater Standard Drawings are on site (OR, if “Design and Construct”, the ‘For Construction’ drawings have been reviewed by Unitywater)	OK ☐
8. All required civil works testing (ITPs) completed by Contracts Inspector	OK ☐
9. Operation and Maintenance Manuals have been received for Vendor supplied components and the Functional Specification is available	OK ☐
10. Electical supply and metering available on site (if powered site)	OK ☐
11. Pole / pillar termination method meets all requirements	OK ☐
12. Check operation of all locks on switchboards	OK ☐
13. Test documentation for Mechanical equipment and Instrumentation has been received. These generally include: • Factory test results • Test compliance cetificates • Instrument calibration certificates • Warranty information	OK ☐
14. FAT completed and critical punchlist items rectified	OK ☐

CONSTRUCTOR			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER SIGNOFF			
Name:	*Position:*	*Signature:*	*Date:*

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PROJECT TITLE:		FINANCE NO:
Pre-commissioning Checklist		**Result / Init. / Date**
General		
1. Check Preliminaries Checklist completed and signed off		OK ☐
Network		
1. Check Commissioning Plan has been approved by Unitywater		OK ☐
2. Advise Network Operations and Control Room of commencement of pre-commissioning acivities and proposed timing of performance and SAT testing		OK ☐
3. Check Network Operations and Control Room are ready for performance and SAT testing and appropriate resources are availbale to assist		OK ☐
4. Confirm Network Operations are aware of impact on downstream infrastructure		OK ☐
5. Advise Operations of proposed timing of performance and SAT testing (fluctuating load)		OK ☐
6. Check sufficient water is available for testing		OK ☐
Electrical, Instruments and Control (E, I & C)		
Switchboards		
1. ENSURE SWITCHBOARD IS <u>NOT</u> ENERGISED		OK ☐
2. Check mains and earth cables are installed and connected		OK ☐
3. Record the cable insulation resistance of the 3 phases	L1 L2 L3	_____ MΩ _____ MΩ _____ MΩ
4. Record earth loop impedance		_____ Ω
5. Check point-to-point phase continuity	R to L1 W to L2 B to L3	OK ☐ OK ☐ OK ☐
6. Check Incomer protection set as per design		OK ☐
7. Check all CT and other links are in place		OK ☐
8. Check correct glands have been utilised for cable entries		OK ☐
9. Cable screens and earthing is as per design		OK ☐
10. Ensure switchboard main Incomer is turned OFF and tagged		OK ☐
11. Check Multiple Earth Neutral (MEN) connection		OK ☐
12. Turn on mains switch		OK ☐

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13. ACKNOWLEDGE SWITCHBOARD IS NOW ENERGISED	OK ☐
14. Check 3 phase voltages AB BC CA	 _____ V _____ V _____ V
Lighting and GPOs	
15. Check light circuit breaker conforms to electrical drawings	OK ☐
16. GPO circuit breaker(s) conform to electrical drawings	OK ☐
17. Check earth leakage circuit breaker has been tested and results are available	OK ☐
18. Internal and external lights are connected and working	OK ☐
19. Internal and external GPOs are connected and working	OK ☐
Flowmeters	
20. Check calibration certificate has been received	OK ☐
21. Check mag flow head is connected to flowmeter converter	OK ☐
22. Check correct supply voltage available at converter	OK ☐
23. Check analogue output is correctly connected to RTU and operating correctly	OK ☐
24. Check totaliser output is correctly connected to RTU and operating correctly	OK ☐
25. Check mechanical (vandal) and UV protection installed on external cable	OK ☐
Field Devices	
26. Check calibration of all analogue signals (including flow and pressure transmitters)	OK ☐
27. Check setting of pressure and flow switches	OK ☐
Radio	
28. Check radio feeder & antenna installation and cable testing (antenna to radio) have been performed, and results certificate received	OK ☐
29. Check surge protection and fly lead is connected between antenna and radio	OK ☐
30. Check Communications earthing kits and earthing are installed on feeder and Surge Diverter respectively	OK ☐
31. Record radio system information Trio ER45051A01-D0 Check & Verify Make & Model are correct Record Serial #	 OK ☐ _____
32. Check unit is powered with correct polarity and voltage 12V DC Supply	OK ☐
33. Check radio is programmed to the correct channel Record frequency	OK ☐ _____MHz

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34. Check radio configuration including stream id serial paramaters are set correctly for the Outstation and record	OK ☐ _____ _____ _____ _____
35. Check data radio diagnostics communication working correctly	OK ☐
Remote Telemetry Units (RTU)	
36. Check unit is powered with correct polarity and voltage DC Supply(ies)	OK ☐
37. Check the UPS battery is connected and charging	OK ☐
38. Check communication is working	OK ☐
39. Check I/O is operational and conforms with current drawings	OK ☐
Control System	
40. Record type of control system installed (i.e. SCADAPack, MultiSmart, MT2-PC)	_____
41. Record controller information Manufacturer Model type Serial no Firmware rev Software rev	 _____ _____ _____ _____ _____
End to End Testing (by Unitywater)	
42. Notify control room of impending end-to-end test (minimum 5 days notice)	OK ☐
43. Check end-to-end test sheet has been reviewed and approved by control room	OK ☐
44. Complete End-to-End Test Sheet to verify communication to SCADA	OK ☐
Mechanical	
General	
45. Check layout conforms with 'For Construction' piping drawings	OK ☐
46. Undertake visual examination of installation and finish of all pipework, mechanical devices, valves and fittings	OK ☐
47. Check accuracy of tagging and labelling	OK ☐
48. Ensure pipework is free of debris capable of causing damage to mechanical equipment when flow commences	OK ☐
49. Check accessibility of access covers and equipment for operational and maintenence purposes	OK ☐
50. Check equipment is guarded appropriately	OK ☐
51. Check that all Vendor Manuals are available	OK ☐
52. Check that manufacturers' requirements have been met (i.e. min. distance to nearest valve/bend, orientation, alignment, lubrication, preparation, priming etc.)	OK ☐

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53. Check instrumentation nozzles are provided in accordance with design (correct side of equipment e.g. US/DS)	OK ☐
54. Check installation and operation of instrument isolation valves	OK ☐
55. Check directional requirements (i.e. valve direction)	OK ☐
56. Check commissioning pressure transmitters or gauges on either side of control valve are operational	OK ☐
Flowmeter	
57. Flowmeter calibration certificate received	OK ☐
58. Check earthing straps are installed accross both flowmeter flanges, earthing rings and to earth as specified by the equipment manufacturer	OK ☐

CONSTRUCTOR			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER SIGNOFF			
Name:	*Position:*	*Signature:*	*Date:*

Wet Testing

PROJECT TITLE:	FINANCE NO:	
Commissioning Schedule	**Result / Init. / Date**	**UW Witness / Initials**
General		
1. Check Pre-commissioning Checklist completed and signed off	OK ☐	
2. Record Top of Slab RL (m) and distance from Top of Slab to each pressure transmitter in Commissioning Worksheet	OK ☐	
3. Record distance from Top of Slab to control valve centreline in Commissioning Worksheet	OK ☐	
Fill and Bleed Main		YES ☐
4. Calculate volume of water required to fill main	OK ☐	
5. Ensure sufficient source water available to fill main and perform operation test	OK ☐	
6. Charge main and bleed air from main and PRV valve body	OK ☐	
7. Perform visual inspection of all piping, fittings and flanged joints for leakage	OK ☐	
Alarm Level Settings		
8. Confirm pressure indicated by the transmitter is reflective of the actual pressure	OK ☐	
9. Confirm upstream and downstream pressure alarm level settings (low, low low, high and high high)	OK ☐	
PRV Control Checks		
Pressure Control *(SCADA adjustable pressure setpoint)*		YES ☐
10. Check pressure controller (EPC) settings	OK ☐	
11. Set a pressure setpoint (downstream pressure to be maintained)	OK ☐	
12. Manually override downstream pressure value to value above pressure setpoint	OK ☐	
13. Open PRV isolation valves and close bypass valves	OK ☐	
14. Confirm control valve closes (and confirm 'fail to meet setpoint' alarm is activated after time delay?)	OK ☐	
15. Manually override downstream pressure value to value below pressure setpoint	OK ☐	
16. Confirm control valve opens fully	OK ☐	
17. Remove manual override on downstream pressure transmitter value	OK ☐	

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18. Confirm valve operates to maintain pressure setpoint	OK ☐	
19. Alter flowrate (upstream pressure conditions) and confirm valve operates to maintain pressure setpoint	OK ☐	
20. Confirm failure mode (on loss of pressure signal and loss of power) is as per specification	OK ☐	
Pressure Control *(pilot controlled pressure setpoint)*		YES ☐
21. Confirm pilot is set to desired pressure setpoint	OK ☐	
22. Open PRV isolation valves and close bypass valves	OK ☐	
23. Confirm valve operates to maintain pressure setpoint	OK ☐	
24. Alter flowrate (upstream pressure conditions) and confirm valve operates to maintain pressure setpoint	OK ☐	
Control Valve Position Indicator		YES ☐
25. Position indicator?	OK ☐	
Opening/Closing Speed Control		YES ☐
26. Opening/closing speed control?	OK ☐	
Manual Open/Close Bypass		YES ☐
27. Manual open/close bypass?	OK ☐	
Other (project specific testing)		YES ☐
28.		
29.		

Wet Testing Signoff

CONSTRUCTOR			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER WITNESS			
Name:	*Position:*	*Signature:*	*Date:*
Name:	*Position:*	*Signature:*	*Date:*
Name:	*Position:*	*Signature:*	*Date:*

SAT / Performance Testing

PROJECT TITLE:	FINANCE NO:
SAT Schedule	**Result / Init. / Date**
General	
1. Check Pre-commissioning Checklist completed and signed off	OK ☐
2. Record Top of Slab RL (m) and distance from Top of Slab to each pressure transmitter in Commissioning Worksheet	OK ☐
3. Record distance from Top of Slab to control valve centreline in Commissioning Worksheet	OK ☐
PRV Control Checks	
Pressure Control *(SCADA adjustable pressure setpoint)*	
4. Check pressure controller (EPC) settings	OK ☐
5. Set a pressure setpoint (downstream pressure to be maintained)	OK ☐
6. Manually override downstream pressure value to value above pressure setpoint	OK ☐
7. Open PRV isolation valves and close bypass valves	OK ☐
8. Confirm control valve closes (and confirm 'fail to meet setpoint' alarm is activated after time delay?)	OK ☐
9. Manually override downstream pressure value to value below pressure setpoint	OK ☐
10. Confirm control valve opens fully	OK ☐
11. Remove manual override on downstream pressure transmitter value	OK ☐
12. Confirm valve operates to maintain pressure setpoint	OK ☐
13. Alter flowrate (upstream pressure conditions) and confirm valve operates to maintain pressure setpoint	OK ☐
14. Confirm failure mode (on loss of pressure signal and loss of power) is as per specification	OK ☐
Pressure Control *(pilot controlled pressure setpoint)*	
15. Confirm pilot is set to desired pressure setpoint	OK ☐
16. Open PRV isolation valves and close bypass valves	OK ☐
17. Confirm valve operates to maintain pressure setpoint	OK ☐
18. Alter flowrate (upstream pressure conditions) and confirm valve operates to maintain pressure setpoint	OK ☐

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Control Valve Position Indicator	
19. Position indicator?	OK ☐
Opening/Closing Speed Control	
20. Opening/closing speed control?	OK ☐
Manual Open/Close Bypass	
21. Manual open/close bypass?	OK ☐
Other (project specific testing)	
22.	OK ☐
23.	OK ☐

SAT Signoff

To verify completion of all SAT items to the satisfaction of Stakeholders.

CONSTRUCTOR			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER WITNESS (Commissioning)			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER WITNESS (Operations)			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER WITNESS (Electrical)			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER WITNESS (SCADA)			
Name:	*Position:*	*Signature:*	*Date:*
UNITYWATER WITNESS (Mechanical)			
Name:	*Position:*	*Signature:*	*Date:*