

Aberthaw 'B' Power Station

MCERTS Report

28 January 2019



Critical Flow Systems Ltd
Specialists in Flow Measurement





Site Information



Site Name: Aberthaw 'B' Power Station

Consent/Permit Holder: RWE Generation UK Plc

Site Address: The Leys, Aberthaw
South Glamorgan
CF62 4ZW

Site Contact: Richard Powell (Station Chemist)

Contact Phone Number: 01446 752 751

Site Ref or Postcode: CF62 4ZW

Grid Ref: ST 02677 66048

Consent/Permit No: EPR/ RP3133LD/ V014

Location of Flow Measurement: Cooling Water Pump sets 7 to 10

Number of flow meters: Pumps 7, 9 & 10 (8 is spare unit)

Type of flow meter: JEP Pump Run Time method

Meter Serial Number(s) : See report for Pump and Pressure Transducer serial numbers

Date of Inspection: 28 January 2019

Inspector: Chris Corris MI 05 014

Inspection Report No: CFS/RRN/6444

Survey Pack: n/a * Kit Inventory and calibration data recorded on central QMS database

Site Total Daily Uncertainty: 4.26%

Site Compliance: Following a site inspection the measurement system was found to meet the requirements of the Environment Agency Minimum Requirements for the self monitoring of effluent flow - Version 4.0 - August 2014

Site Details

Site Description

Aberthaw is a large coal fired power station situated on the Bristol Channel in the Vale of Glamorgan. The station is owned and operated by RWE. The plant is direct cooled and is made up of three generating units.

Location of Flow meter(s)

Cooling water is abstracted from the Channel and pumped through three condensers. The three pumps (plus one spare) are located in a large pump house building. Pressure transducers are located on the up & downstream side of each pump set.

Emission point(s) requiring flow measurement

Table S3.2 does not identify MCERTS requirements for W1 or W2 discharge. However there is a requirement for a mass balance reporting and IC8 specifically request MCERTS. There are no flow volume discharge limits.

Verification / Calibration

The system was verified using the JEP Pump run time methodology, using the pressure transducers (suction & discharge) and pumps for each Unit. A verification is observed via flow monitors on the feed to the units which receives 90% of the abstracted water.

Site maintenance arrangements, evidence and suitability

A Preventative Maintenance schedule has been implemented as part of the consent holders Quality Management System, as audited by SIRA. The pressure transducers are inspected and calibrated annually. The pumps are serviced on a rolling basis as per the outage schedule.

Comments about the installation and/or MI judgement

The methodology appears to work well and is a good practical solution to monitor the effluent discharge.



Pump Sets 7, 8, 9 & 10



Pressure Transducers



MCERTS Report

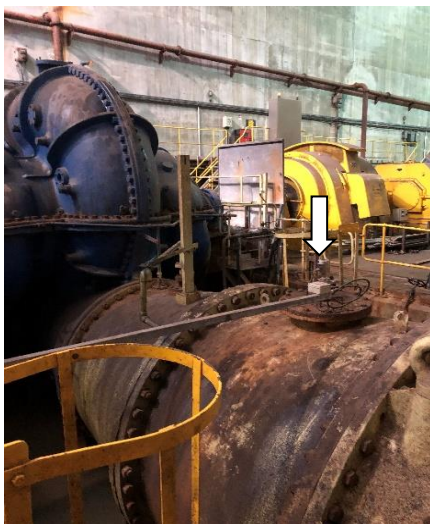
Aberthaw 'B' Power Station



Drysdale Pump 7



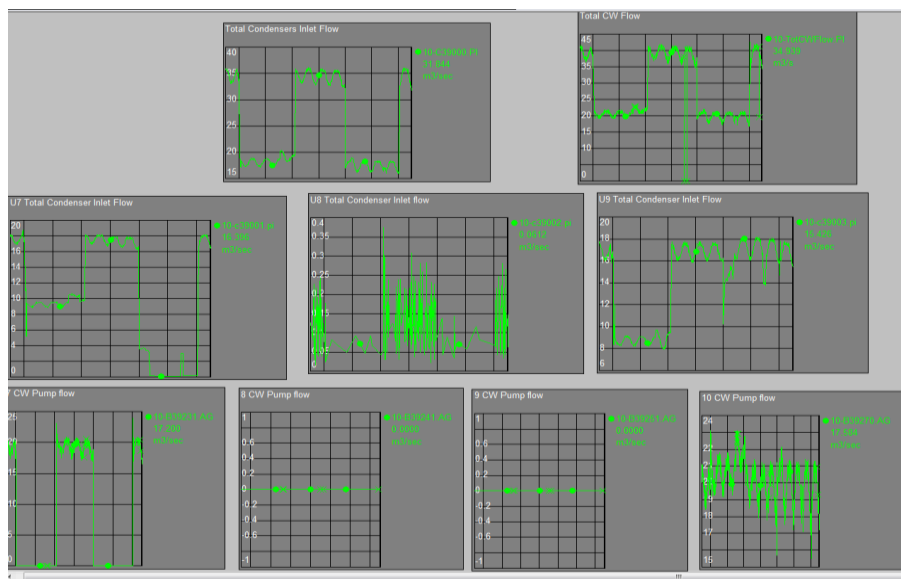
Pump and Suction Pressure Transducer



Discharge Pressure Transducer



PLC Controller



Data from the CW pumps and condenser flow meters is returned to the system (PI) as individual flows and a totalised value.



Equipment Information & Calibration Details



Pump				
Pumpset No.	7	8	9	10
Manufacturer	Drysdale Ltd	Drysdale Ltd	Drysdale Ltd	Drysdale Ltd
Type	96"/96" DXL	96"/96" DXL	96"/96" DXL	96"/96" DXL
Identifier*	7 CW Pump	8 CW Pump	9 CW Pump	F78044/7

Pressure Transducers				
Pump Suction				
Manufacturer	Siemens	Siemens	Siemens	Siemens
Type	Sitrans P300	Sitrans P300	Sitrans P300	Sitrans P300
Serial Number	N1-E715-9705806	N1-E430-9705360	N1-E430-9705354	N1-E430-9705358
Pipe Diameter**	2.44 M	2.44 M	2.44 M	2.44 M
Calibration Certificate	CW7S 2018	CW8S 2018	CW9S 2018	CW10S 2018
Cal Date	20/07/2018	21/07/2018	28/07/2018	28/07/2018
Pump Discharge				
Manufacturer	Siemens	Siemens	Siemens	Siemens
Type	Sitrans P300	Sitrans P300	Sitrans P300	Sitrans P300
Serial Number	N1-E430-9705361	N1-E430-9705352	N1-E430-9705356	N1-E430-9705352
Pipe Diameter**	2.44 M	2.44 M	2.44 M	2.44 M
Calibration Certificate	CW7D 2018	CW8D 2018	CW9D 2018	CW10D 2018
Cal Date	20/07/2018	21/07/2018	28/07/2018	28/07/2018

* The name plates have become worn and have been assigned new identifiers/serial numbers.

** Original specification is in imperial units (8 feet).



Pressure Tests and Uncertainty

CW Pump 7 Suction

Random Error	0.36%
Systematic Error	0.08% *
Total Error	0.37%

CW Pump 7 Discharge

Random Error	0.35%
Systematic Error	0.08%
Total Error	0.36%

CW Pump 8 Suction

Random Error	0.03%
Systematic Error	0.08%
Total Error	0.08%

CW Pump 8 Discharge

Random Error	0.02%
Systematic Error	0.08%
Total Error	0.08%

CW Pump 9 Suction

Random Error	0.06%
Systematic Error	0.08%
Total Error	0.10%

CW Pump 9 Discharge

Random Error	0.06%
Systematic Error	0.08%
Total Error	0.10%

CW Pump 10 Suction

Random Error	0.06%
Systematic Error	0.08%
Total Error	0.10%

CW Pump 10 Discharge

Random Error	0.06%
Systematic Error	0.08%
Total Error	0.10%

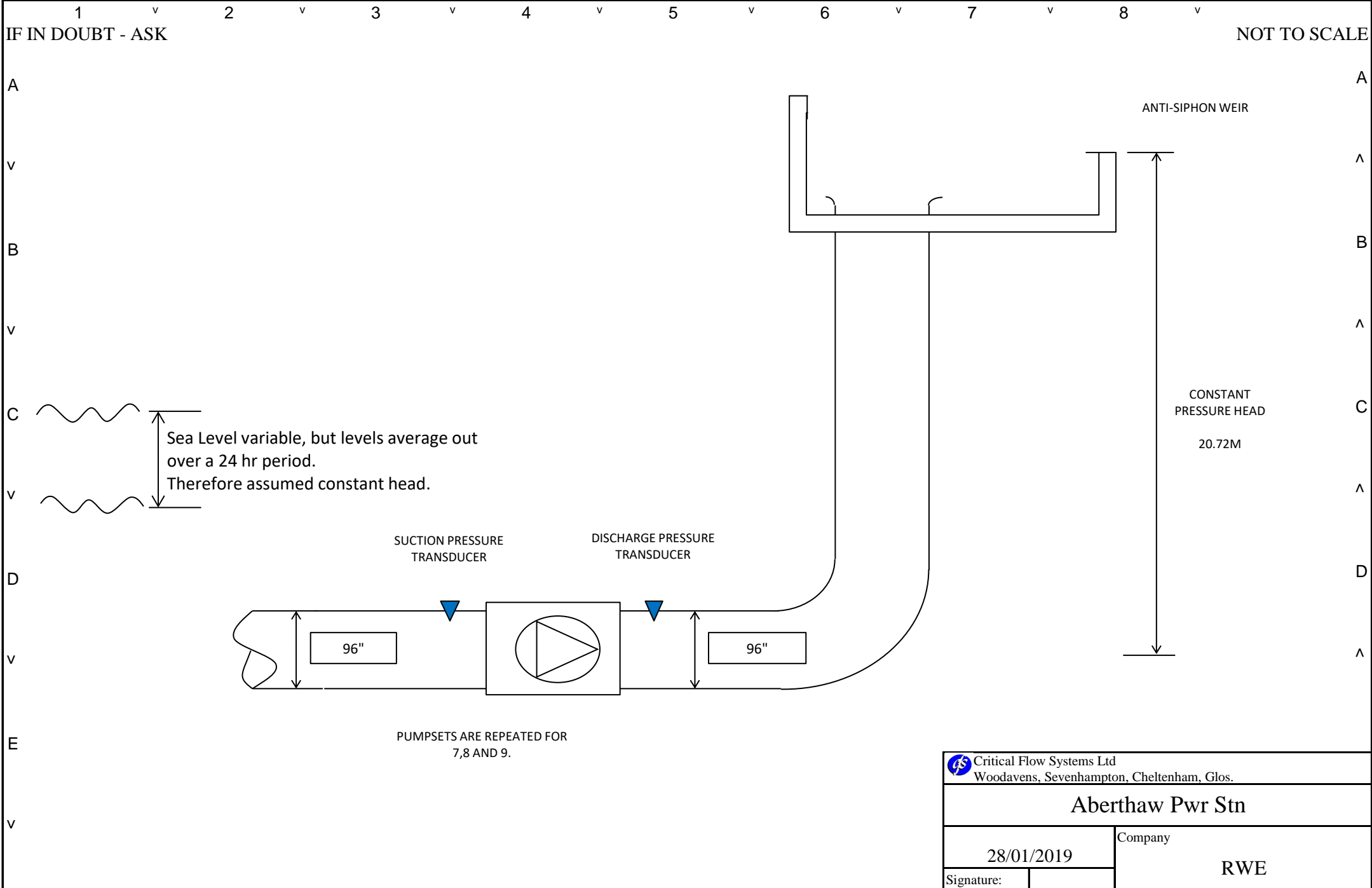
* Systematic Error 0.075% (Siemens specification)

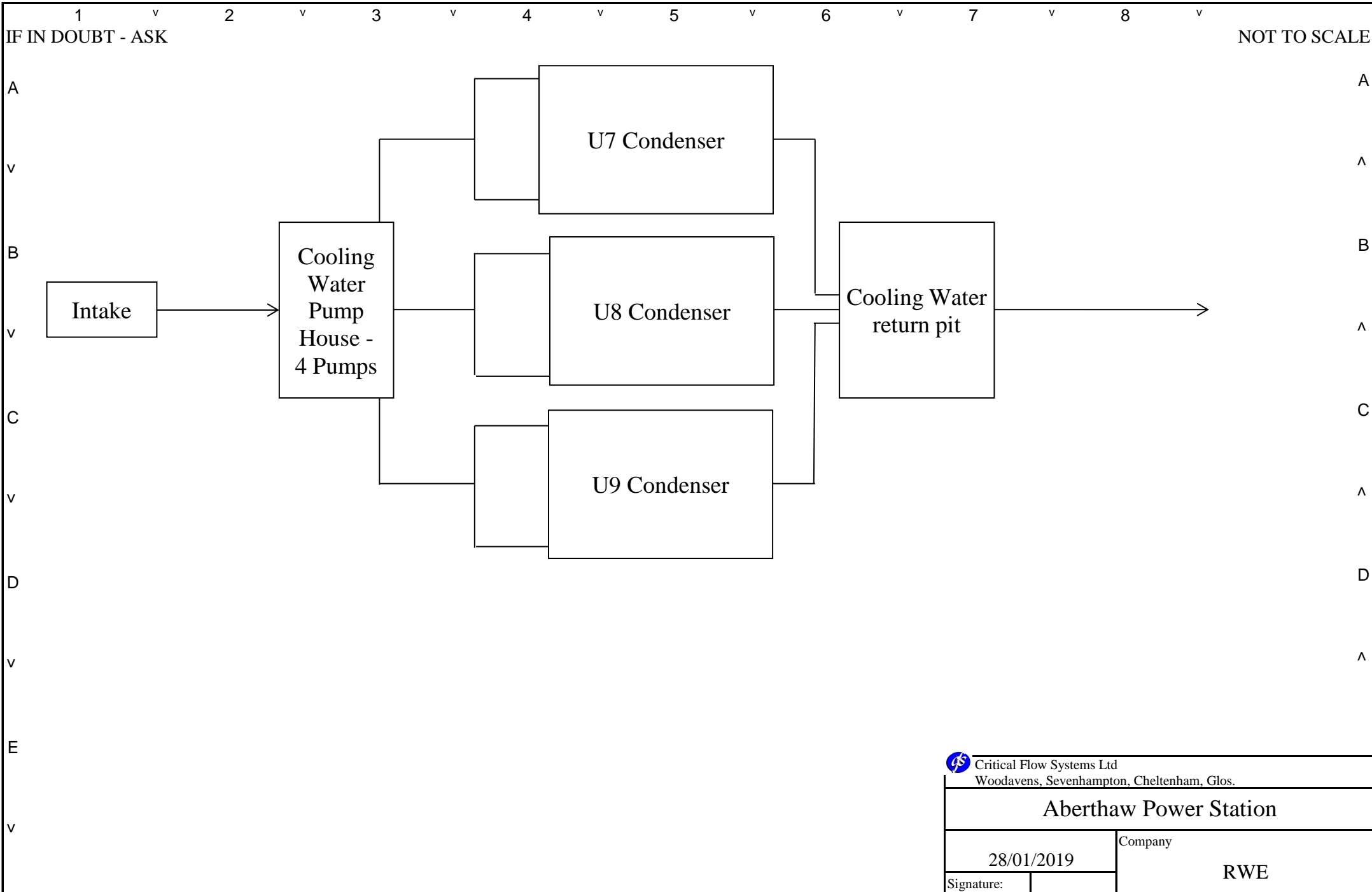
Suction Pressure Err	0.36%	0.08%	0.10%	0.10%
Discharge Pressure Err	0.36%	0.08%	0.10%	0.10%
Cooling Water Inlet Temp*	0.42	0.42	0.42	0.42
Accuracy of Curve*	4.24	4.24	4.24	4.24

Total Error	4.26%	4.26%	4.26%	4.26%
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*Estimated Error provided by JEP report

Overall Uncertainty of the system 4.26%







Appendix

Example copy of Pressure Transducer Calibration Certificate.

CALIBRATION CERTIFICATE

Printed: 29.07.2018 12:59:14
Printed by: shaun jenkins

Certificate Number:

POSITION ID: 7 CW Discharge Pressure

POSITION

Position Name:
Work Order Number:
Location:
Plant Structure: Common Plant/CW Pump House/CW Pump 7/

DEVICE

Device ID: 7 CW Discharge
Serial Number: N1-E430-9705361
Manufacturer Model: Siemens SITRANS P300
Rangeability:
Operating Temp.:
Humidity:

FUNCTION

Function: Pressure Transmitter (pt)
Transfer Function: Linear
Range (I/O): -5 to 145 ftH2O (G) 4 to 20 mA

CALIBRATION EVENT

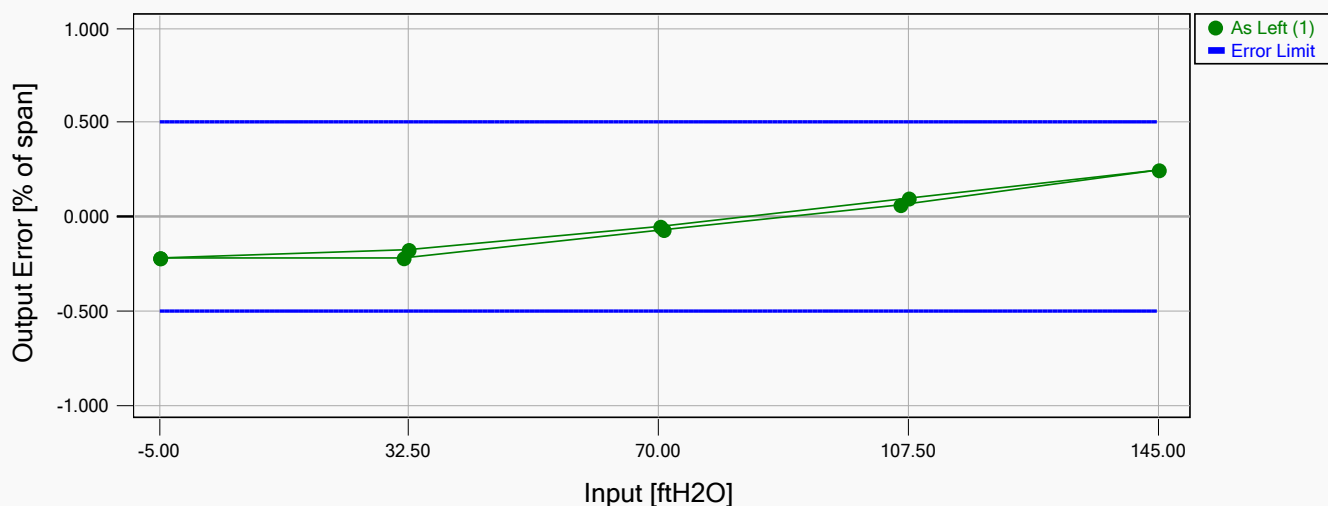
Calibration Date: 20/07/2018 13:30:21
Next Cal. Date: 20/07/2019
Environment Temp.: °C
Humidity: %

PROCEDURE

Due Date: 05/05/2018 Interval: 12 months
Reject if Error >: 0.5 % of span Adjust To <: % of span
Classification:
Calibration Strategy:

CALIBRATORS

Input Calibrator: MC6 s/n: 603739 Due Date: 13/10/2018
Input Module: P20C s/n: 59485 Due Date: 13/10/2018
Output Calibrator: MC6 s/n: 603739 Due Date: 13/10/2018
Output Module: IN s/n: 23405 Due Date: 13/10/2018



1. As Left

PASSED

Max Error: 0.25 % of span

Nominal Input [ftH2O]	Actual Input [ftH2O]	Nominal Output [mA]	Actual Output [mA]	Found Error [% of span]
-5.000	-5.00	4.000	3.9650	-0.22
32.50	32.35	8.00	7.9558	-0.18
70.00	70.25	12.00	12.0184	-0.05
107.5	107.54	16.0	16.0200	0.10
145.00	145.22	20.00	20.0639	0.25
107.5	106.35	16.0	15.8865~	0.06~
70.00	70.72	12.00	12.0651	-0.07
32.50	31.81	8.00	7.8918	-0.22
-5.000	-4.96	4.000	3.9688	-0.22

Calibration Note:

Calibrated by: PAUL PADWAGGA
20/07/2018 13:30:21

Approved: