ENGINEERING SERVICES DEPARTMENT

Secondary Water Pump P1605 Specification Sheet

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Project	NW PlasGas and CWOPG Projects	**Unit Tag Number**	P1605
Datasheet Document No.	ENS-NWPVR-SPE-24016	**Revision**	3
Description	Pump P1605 in the integrated Nuclear Waste Plasma Gasification (NW PlasGas) and Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Facilities is used to recirculate secondary cooling water, in the form of process water, from the sump of cooling tower T1604 through the plate-heat exchanger H1603, and back to the cooling tower [1], Note [k]. The process water exits the cooling tower sump at 25°C and returns at 35°C.		
Plant Location	NECSA, Pelindaba, North-West Province.		
Equipment Location	Integrated NW PlasGas and (CWOPG) Facilities - Outside Laboratory 150, Building V-H2.		
Safety Classification	Non-classified (N) & SC-3 (C) [i]		
Quality Classification	Non-classified (N) & QC-3 (C) [g]		

FLUID PROPERTIES

Process Fluid	Process water.
Solids Content	Assumed to be zero due to strainer installed upstream of the pump.
Corrosive Due To	N/A

PARAMETERS	**UNITS**	**MINIMUM**	**NORMAL**	**MAXIMUM**
Operating Temperature	**°C**	18	25	60
Fluid Density	**kg/m^3**	998	997	983
Viscosity	**kg/m.s**	8,63 x 10^{-4}	7,64 x 10^{-4}	4,48 x 10^{-4}
Liquid Vapour Pressure	**kPa(a)**	2,06	3,17	19,92

HYDRAULIC PROPERTIES

PROPERTIES	**UNITS**	**MINIMUM**	**NORMAL**	**MAXIMUM**
Flow Rate [2]	**m^3/h**	5,38	17,95	21,55
Pump Inlet Pressure [4]	**kPa(a)**	92,19	81,13	75,81
Pump Outlet Pressure [4]	**kPa(a)**	244,53	343,64	387,00
Pressure Differential [4]	**kPa**	152,34	262,51	311,19
Required Pump Head [2]	**m**	15,56	26,84	32,27
NPSH Available [2]	**m**	9,10	7,97	7,41

GENERAL PROPERTIES

Type of Pump Recommended	Centrifugal Pump	
Pump Direction	**Horizontal:** ☑	**Vertical:** ☐

ELECTRICAL & GENERAL PROPERTIES

Volts	Supplier to advise
Phase	Supplier to advise
Hz	Supplier to advise

MECHANICAL PROPERTIES

Type of Seal	**Mechanical** ☑	**Magnetic** ☐	**Stuffing box** ☐
Dry Run Protection	Yes - Supplier to provide		
Impellor Material	Supplier to advise		
Pump Casing Material	Supplier to advise		
Type of Seal	Supplier to advise		
Shaft Material	Supplier to advise		

PIPE NOZZLE

Pipe Suction	**Size:**	80 NB	**Rating:**	150#	**Flange Spec. :** CS, ASTM A105, ASME B16.5, RF
Pipe Discharge	**Size:**	50 NB	**Rating:**	150#	**Flange Spec. :** CS, ASTM A105, ASME B16.5, RF

POWER

Absorbed Power	Supplier to advise
Installed Power	Supplier to advise
Noise Criteria	Maximum allowable sound level is 85 dB(A) at a distance of 1 m from pump

VENDOR DATA REQUIRED WITH TENDER

1. **Pump performance curve**
2. **Pump duty**
3. **Pump efficiency**
4. **Pump rotational speed**
5. **Pump dimensions with baseplate**

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REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-NWPVR-PID-24003: NW PlasGas P&ID Diagram – NW PlasGas Demonstration Plant Subsystem 16

[2] ENS-NWPVR-REP-24030: Centrifugal Pumps Sizing Report for NW PlasGas Facililty

[3] ENS-OWPVR-REP-25009: Centrifugal Pumps Sizing Report for Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Facililty

[4] Learman, Simon. (2009). Pump Sizing Calculator, Blackmonk Engineering Ltd

[5] ENS-OWPVR-PID-24006: Uranium Contaminated Waste Oil Plasma Gasification P&ID - Cooling Water Supply System

NOTES AND ABBREVIATIONS

[a] ASME - American Society of Mechanical Engineers

[b] ASTM - American Society for Testing and Materials

[c] CS - Carbon Steel

[d] dB - Decibel

[e] NB - Nominal Bore

[f] N/A - Nominal Applicable

[g] QC - Quality Class

[h] RF - Raised Face

[i] SC - Safety Class

[j] Supplier to advise on special requirements for installation of pump

[k] The NW PlasGas and CWOPG will not be operated simultaneously. Therefore, the secondary water pump will service only one of the facilities at any given time.

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