ENGINEERING SERVICES DEPARTMENT

WASTE WATER TRANSFER PUMP P1515 SPECIFICATION SHEET

Project	NW PlasGas and CWOPG Demonstration Facilities.	**Unit Tag Number**	P1515
Datasheet Document No.	ENS-NWPVR-SPE-24015	**Revision**	3
Description	Pump P1515 will be required to periodically transfer solution (effluent) from the waste water tank T1506 via two routes during operation, the first, being from the tank to a nearby road tanker for transport to the Building A8 Effluent Processing Facility, and the second, being recirculation of the tank's contents to create a homogeneous mixture for sampling. The effluent that is collected in the tank will come from either the Low-Level Waste Plasma Gasification (NW PlasGas) Facility or the Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Demonstration Facility, however, the tank will not contain effluent from both Facilities at the same time [1].		
Plant Location	NECSA, Pelindaba, North-West Province		
Equipment Location	NW PlasGas & CWOPG Demonstration Facilities - Outside Laboratory 150, north side of Building V-H2.		
Safety Classification	SC-3(N) & SC-2(C) [a]		
Quality Classification	SC-3(N) & SC-2(C) [b]		

FLUID PROPERTIES

	NW PlasGas	**CWOPG**
Process fluid	Spent scrubbing solution containing (% w/w) 63.8% H_2O, 4.35% KCl, and 31.8% $KHCO_3$ [3] during normal operation. Note [f].	Spent scrubbing solution containing (% w/w) 65.3% H_2O, 0.016% KF, 0.061% KCl, and 34.6 $KHCO_3$ [4] during normal operation. Note [f]
Solids content	Note [e]	
Corrosive due to	KOH (aq) and K_2CO_3 (aq).	KOH (aq), KF (aq) and K_2CO_3 (aq).

PROPERTIES	**UNITS**	**MINIMUM**	**NORMAL**	**MAXIMUM**
Operating temperature	**°C**	18	25	40
Fluid density	**kg/m^3**	1288.5	1284.1	1274.8
Viscosity	**Pa.s**	8.63 x 10^{-4}	7.64 x10^{-4}	5.99 x10^{-4}
Vapor pressure	**kPa**	2.039	3.143	7.359

HYDRAULIC PROPERTIES

PARAMETERS	**UNITS**	**MINIMUM**	**NORMAL**	**MAXIMUM**
Flow rate	**m^3/h**	1.11	3.69	4.42
Pump inlet pressure	**kPa (a)**	86.24	79.44	76.17
Pump outlet pressure	**kPa (a)**	172.83	361.74	449.09
Differential Pressure	**kPa**	86.59	282.30	372.92
Required Pump Head	**m**	6.85	22.41	29.82
NPSH available	**m**	8.00	7.46	7.20

MECHANICAL PROPERTIES

Pump type	Air Operated Double Diaphragm Pump [d]					
Diaphragm type	Supplier to advise			**Diaphragm diameter**	Supplier to advise	

Process Connections

Pipe Suction	**Size**	25mm	**Rating**	150#	**Flange Spec.**	SS, ASTM A182-F304/304L, ASME B16.5
Pipe Discharge	**Size**	25mm	**Rating**	150#	**Flange Spec.**	SS, ASTM A182-F304/304L, ASME B16.6
	Vent	Supplier to advise			**Drain**	Supplier to advise
Seal Fluid	Supplier to advise					
Material of Construction	**Casing**	Supplier to advise			**Diaphragm**	Supplier to advise
	Shaft	Supplier to advise			**Seal**	Supplier to advise
	Packing	Supplier to advise			**Other**	Supplier to advise

ELECTRICAL PROPERTIES

Electrical (Y/N)	N	**Volts**	N/A	**Phase**	N/A	**Hz**	N/A

VENDOR DATA REQUIRED WITH TENDER

1 Pump technical data
2 Utility Requirements
3 Pump dimensions with baseplate

REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-NWPVR-PID-24002, P&ID Diagram - NW PlasGas Demonstration Plant Subsystem 15
[2] ENS-NWPVR-REP-24036, Positive Displacement Pumps Sizing Report for the NW PlasGas demonstration facility
[3] ENS-NWPVR-CLC-24015, Scrubber Design for the Low-Level Waste Plasma Gasification (NW PlasGas) Demonstration System
[4] ENS-OWPVR-CLC-24006, Scrubber Design for the Uranium Contaminated Waste Oil Plasma Gasification Project

NOTES

[a] SC - Safety Class
[b] QC - Quality Class
[c] Supplier to advise on special requirements for installation of pump.
[d] Air supply available at a maxiumum pressure of 5.5 bar (g), with a minimum air quality standard of ISO 8573-1.2010 [3:4:1].
[e] Under abnormal conditions, ash and/or traces of uranium-containing solids (e.g. UO_3) may be present in the spent solution
[f] Presence of KOH and/or K_2CO_3 in place of or together with $KHCO_3$ is possible under abnormal situations.
[g] Note to supplier: The air supply pressure regulator, complete with pressure gauge, must be supplied with the pump.

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