



ENGINEERING SERVICES DEPARTMENT		 <small>South African Nuclear Energy Corporation SOC Limited</small>		
Primary Water Pumps P1602A & B Specification Sheet				
<b>Project</b>	NW PlasGas and CWOPG Projects	<b>Unit Tag Number</b>	P1602A & B	
<b>Datasheet Document No.</b>	ENS-NWPVR-SPE-24017	<b>Revision</b>	3	
<b>Description</b>	Pump P1602A or B is used to circulate primary cooling water, in the form of demineralized water, through the Nuclear Waste Plasma Gasification (NW PlasGas) and Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Facilities <sup>Note [k]</sup> . Water is pumped from the primary cooling water tank T1601 to a supply manifold Y1607, from where it is distributed to various users in the plant. Downstream of the users, the water recombines via a return manifold Y1606. It then passes through a plate heat exchanger H1603 before being recirculated back into the primary tank <sup>[1]</sup> . The demineralized water is supplied from and returns to the primary tank at 30 °C and 40 °C, respectively.			
<b>Plant Location</b>	NECSA, Pelindaba, North-West Province.			
<b>Equipment Location</b>	Integrated NW PlasGas and (CWOPG) Facilities - Outside Laboratory 150, Building V-H2.			
<b>Safety Classification</b>	Non-classified (N) & SC-3 (C) <sup>[h]</sup>			
<b>Quality Classification</b>	Non-classified (N) & QC-3 (C) <sup>[f]</sup>			
FLUID PROPERTIES				
<b>Process Fluid</b>	Demineralised water.			
<b>Solids Content</b>	Assumed to be zero due to strainer installed upstream of the pump.			
<b>Corrosive Due To</b>	N/A			
PARAMETERS	UNITS	MINIMUM	NORMAL	MAXIMUM
Operating Temperature	°C	18	30	60
Fluid Density	kg/m <sup>3</sup>	998	996	983
Viscosity	kg/m.s	8,63 x 10 <sup>-4</sup>	7,03 x 10 <sup>-4</sup>	4,48 x 10 <sup>-4</sup>
Liquid Vapour Pressure	kPa(a)	2,06	4,24	19,92
HYDRAULIC PROPERTIES				
PROPERTIES	UNITS	MINIMUM	NORMAL	MAXIMUM
Flow Rate <sup>[2]</sup>	m <sup>3</sup> /h	5,29	17,65	21,18
Pump Inlet Pressure <sup>[4]</sup>	kPa(a)	108,54	91,79	84,01
Pump Outlet Pressure <sup>[4]</sup>	kPa(a)	438,47	698,16	814,68
Pressure Differential <sup>[4]</sup>	kPa	329,94	606,37	730,67
Required Pump Head <sup>[2]</sup>	m	33,7	62,06	75,77
NPSH Available <sup>[2]</sup>	m	10,67	8,96	8,16
GENERAL PROPERTIES				
<b>Type of Pump Recommended</b>	Centrifugal Pump			
<b>Pump Direction</b>	<b>Horizontal:</b> <input checked="" type="checkbox"/>	<b>Vertical:</b> <input type="checkbox"/>		
ELECTRICAL & GENERAL PROPERTIES				
<b>Volts</b>	Supplier to advise			
<b>Phase</b>	Supplier to advise			
<b>Hz</b>	Supplier to advise			
MECHANICAL PROPERTIES				
<b>Type of Seal</b>	<b>Mechanical</b> <input checked="" type="checkbox"/>	<b>Magnetic</b> <input type="checkbox"/>	<b>Stuffing box</b> <input type="checkbox"/>	
<b>Dry Run Protection</b>	Yes - Supplier to provide			
<b>Impellor Material</b>	Supplier to advise			
<b>Pump Casing Material</b>	Supplier to advise			
<b>Type of Seal</b>	Supplier to advise			
<b>Shaft Material</b>	Supplier to advise			
PIPE NOZZLE				
<b>Pipe Suction</b>	<b>Size:</b> 80 NB	<b>Rating:</b> 150#	<b>Flange Spec. :</b>	SS, ASTM A182-F304/304L, ASME B16.5, RF
<b>Pipe Discharge</b>	<b>Size:</b> 50 NB	<b>Rating:</b> 150#	<b>Flange Spec. :</b>	SS, ASTM A182-F304/304L, ASME B16.5, RF
POWER				
<b>Absorbed Power</b>	Supplier to advise			
<b>Installed Power</b>	Supplier to advise			
<b>Noise Criteria</b>	Maximum allowable sound level is 85 dB(A) at a distance of 1 m from pump			

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<b>VENDOR DATA REQUIRED WITH TENDER</b>			
1. Pump performance curve	4. Pump rotational speed		
2. Pump duty	5. Pump dimensions with baseplate		
3. Pump efficiency			
<b>REFERENCE DRAWINGS AND DOCUMENTS</b>			
[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 Facility			
[3] ENS-OWPVR-REP-25009: Centrifugal Pumps Sizing Report for Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Facility			
[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			
<b>NOTES AND ABBREVIATIONS</b>			
[a] ASME - American Society of Mechanical Engineers			
[b] ASTM - American Society for Testing and Materials			
[c] dB - Decibel			
[d] NB - Nominal Bore			
[e] N/A - Nominal Applicable			
[f] QC - Quality Class			
[g] RF - Raised Face			
[h] SC - Safety Class			
[i] SS - Stainless Steel			
[j] Supplier to advise on special requirements for installation of pump			
[k] The NW PlasGas and CWOPG will not be operated simultaneously. Therefore, the primary water pumps will service only one of the facilities at any given time.			
<b>Function</b>	<b>Name</b>	<b>Signature &amp; Date</b>	
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<b>Approved</b>	K. Moodley (Chief Process Engineer)		
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