ENGINEERING SERVICES DEPARTMENT

COOLING TOWER T1604 SPECIFICATION SHEET

Project	NW PlasGas Project	**Unit Tag Number**	T1604
Datasheet Document No.	ENS-NWPVR-SPE-24008	**Revision**	2
Description	The cooling tower provides process water to the plate heat exchanger H1603 for cooling the heated demineralized water in the integrated Nuclear Waste Plasma Gasification (NW PlasGas) and Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Facilities. The process water is then recirculated from the heat exchanger back to the cooling tower.		
Equipment Location	Integrated NW PlasGas and (CWOPG) Facilities - Outside Laboratory 150, Building V-H2.		
Plant Location	Necsa, Pelindaba, North-West Province.		
Safety Classification	Non-classified (N) and SC-3 (C).		
Quality Classification	Non-classified (N) and QC-3 (C).		

FLUID PROPERTIES

Process Fluid	Process water
Process Water Quality	pH, ≥ 5 to ≤ 9.7; Conductivity, ≤170 mS/m; Alkalinity, ≤ 1200 mg/L; Cl ≤ 300 mg/L; Hardness, ≥ 20 to ≤ 200 mg/L; Treatment, Chloraminated system [1].
Solids Content	None (apart from sand, dust, dirt, etc. from the surrounding environment)
Corrosive Due To	N/A

PARAMETERS		**UNITS**	**NORMAL**	**MAXIMUM**
Total Rated Capacity		**kW**	208 [3]	239
Water Flow Rate		**kg/h**	17 876 [3]	21 000
Inlet Water temperature		**ºC**	35 [3]	40
Outlet water Temperature		**ºC**	-	25 [3]
Dry-bulb	**Summer**	**ºC**	32 [4]	-
	Winter	**ºC**	2 [4]	-
Wet-bulb	**Summer**	**ºC**	21.6 [4]	-
	Winter	**ºC**	- 1 [4]	-
Pump Head Required		**m**	N/A	

DESIGN DATA

Type of Cooling Tower		Counter-flow mechanical draft wet cooling tower.
Type of Structure		Supplier to advise
Type of Fill		Supplier to advise
Basin Depth	**m**	Supplier to advise
Water Inlet Pipe Diameter	**mm**	50 NB Sch. 40
Water Outlet Pipe Diameter	**mm**	80 NB Sch. 40
Make Up Water Pipe Diameter	**mm**	15 NB Sch. 40
Overflow/ Drain Pipe Diameter	**mm**	Supplier to advise

FAN DESIGN

Fan Drive Type		Centrifugal or axial fan (supplier to advise).
Fan Wheel Type		Supplier to advise
Drive Arrangement		Supplier to advise
Bearings		Supplier to advise
Guard		Supplier to advise
Fan Motor Speed	**RPM**	Supplier to advise

MECHANICAL, ELECTRICAL & GENERAL PROPERTIES

Electrical Requirements	Volts, Phase and Hertz to be specified according to supplier's datasheets.
Process Connections	**Size:** Inlet = 50 NB / Outlet = 80 NB / Make up water = 15 NB **Type**: Weld neck flange, RF **Flange Spec**.: CS, ASTM A105, ASME B16.5 **Class**: 150
Drain and Flow	Valve arrangement into the drain
Material of Construction	**Piping**: Carbon Steel inlet and oulet piping **Frame**: Fibre Reinforced Plastic, with sturdy structural hot dipped galvanized steel frame **Nozzle Material**: Polypropylene / HDPE
Header Fittings	Galvanized / PVC / HDPE

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Height of Cooling Tower	Supplier to advise. See Note 1.		
Paint on Base Frame	Supplier to advise		
Noise Criteria	85 Db at 1 m.		
Tag No.	To be marked on cooling tower with black letters. SS Tag to be firmly attached.		

REFERENCE DRAWINGS AND DOCUMENTS

[1] SANS 241:2015 Standard Limits - Rand Water Supply to Tshwane Municipality Water Quality Report.

[2] ENS-NWPVR-PID-24003, NW PlasGas Project - P&ID Diagram: Demonstration Plant Subsystem 16.

[3] ENS-NWPVR-REP-24017, Energy Balance Report for NW PlasGas Demonstration Facility.

[4] ENS-MES-SPE-0003, Uranium Conversion Plant Ventilation User Requirement Specification.

[5] ENS-OWPVR-CLC-24002, Mass & Energy Balance Calculations for the Uranium Contaminated Waste Oil Plasma Gasification Project.

NOTES

1) The available space for installation of the cooling tower in the plant (L = 1 m, W = 1 m, H = 2.5 m).

2) The cooling tower sump shall have a regular ball float valve with a quick fill arrangement linked to the make up water pipe diameter.

3) The NW PlasGas and CWOPG will not be operated simultaneously. Therefore, the cooling tower will service only one of the facilities at any given time.

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