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Title	Scope of Work for the Installation of the Emergency Cooling Water System at A-26 Smelter plant.
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1. INTRODUCTION

This document describes the scope of works for the mechanical installation of the Emergency Cooling Water System at the A-26 Smelter plant. All equipment and piping to be tested prior to commissioning of the system.

2. OBJECTIVE

The objective of this document is to outline activities and deliverables that have to be procured for the implementation of this project. The installation of the holding tank, offloading self-priming recirculation pump, coupling to existing furnace outside piping and the delivery piping, and piping supports to the road tanker.

3. REFERENCES AND ABBREVIATIONS

3.1. References

This document conforms to the requirements of:
Not Applicable.

This document refers to the following documents:
[1] Nteo, M. (2025) *System Design Description: Smelter Emergency Cooling Water Collection System*. NLM-DP-00003. Necsa.

3.2. Abbreviations

Abbreviation	Description
SOW	Scope of Work
NECSA	South African Nuclear Energy Corporation
BBBEE	Broad-Based Black Economic Empowerment
COIDA	Compensation for Occupational Injuries and Diseases Act
OHSA	Occupational Health and Safety Act

4. REVISION HISTORY

This document has been revised in accordance with the following schedule:

Revision No.	Date approved	Nature of Revision	Prepared
1.0	See title page	First issue.	SM Lamola

5. BACKGROUND

The Emergency Cooling Water System at A-26 Smelter plant shall be used in the event of loss of the primary cooling water system. In the event that the primary cooling water system fails or is unavailable, the induction coils will not be cooled, and the water temperature will keep rising leading to expansion of the water. This may cause rupture and/or corrosion of the induction coils and/or risk of a steam explosion. Therefore, the induction coils must be cooled to a safe temperature by an emergency cooling water system. This is achieved by cooling the coils for a period after the furnace has been shut down. Due to possible contamination of the cooling water, it is collected in a temporary holding tank. The uranium content in the water shall be analysed prior to offloading the water for safe disposal or further processing [1].

5.1. The installation of the holding tank T2101

- The location adjacent to the smelter plant building is suitable for the holding tank based on factors like proximity to the cooling equipment, accessibility, water source, environmental conditions, and safety.
- The Civil Engineer shall advise if the current ground slab is suitable to directly erect the bund Y2102 on it or excavate the ground slab to ensure that the foundation can support the weight of the tank when it is filled with water.
- Prepare the site by clearing any debris.
- Ensure proper drainage around the tank area to prevent water accumulation around the installation site, which could result in damage or flooding.
- Once the tank is installed, it must be sealed properly to prevent leaks. A leak test as specified in SANS 10329 par 5.2 shall be performed to ensure there are no leaks and the tank can handle the required internal pressure.

5.2. Offloading self-priming recirculation pump P2103

- Perform an initial inspection of the pump package for any damage during transit (e.g., cracks, dents, missing parts). Ensure the pump and its components (motor, pump head, seals, and accessories) are intact and match the specifications.
- Lift the pump safely from the delivery vehicle using appropriate lifting equipment. Use slings or lifting chains as per the manufacturer's recommendations to avoid damage to the pump casing.
- Transport the pump from the unloading area to the installation site, ensuring that the path is clear and the pump remains upright to avoid damage to sensitive components.
- Once offloaded, position the pump at the designated location for installation. Ensure that the space is adequate for installation, maintenance access, and that the pump aligns with the system's piping connections (inlet and outlet).
- Ensure the pump’s foundation or plinth is on level and stable to ensure smooth operation and optimal fluid circulation.
- Secure pump to plinth.

5.3. Piping

- Perform a detailed hydrostatic test procedure for Necsa to review and approve before commencing with hydrostatic test (A manual hand pump shall be used during hydrostatic test). The following lines are to be tested:
  - 40-21-WCCP-001
  - 40-21-WCCP-002
  - 15-21-WCCP-003
  - 40-21-WCCP-004
  - Hose
- Install the appropriate type of piping, fittings, valves and piping supports. As per isometric drawings and BOM.
- Ensure that the connections are compatible with the existing system in terms of material, size, and pressure rating. As per isometric drawings and BOM.
- Prepare as-built drawings, operation manuals, and a detailed report of the work performed.

5.4. Tank Level Indicator LI 2101A

- Instrument is provided by Necsa.
- Contractor to install Level Indicator.
- Necsa C&I to connect it to SCADA.

5.5. Pressure gauge PI2103A

- During pressure testing, check that the readings correspond to pressure testing gauge apparatus. Ensure accuracy of pressure gauge PI2103A.

5.6. Self-priming centrifugal pump P2103

- Ensure the pump operates efficiently as per Equipment specification, to be able to transfer medium from both the holding tank T2101 and bund B2102.

6. SPECIFICATION

6.1. Technical requirements (Generic Necsa requirements on SOW documents)

- Personnel shall be suitably qualified and experienced to perform tasks typically like installation and mounting of the pumps and motors. All labour personnel shall be suitably qualified and experienced to carry out the works. They should provide CV's and qualifications (up to date). Proof of any relevant technical training shall also be submitted. The organisational structure shall be provided to the Necsa representative for approval.
- Service Provider shall accompany the bid with proof of appointment letters from relevant companies on similar work performed.

6.2. Contractor Responsibilities and Additional Requirements as listed in Table 1

Items marked in the "Date" column of Table 1 as "Provide together with submission of bid" are mandatory and automatic disqualification shall follow for non-compliance by the Service Provider.

Table 1: Contractor Responsibilities and Additional Requirements

Requirement	Responsibility	Date
[1] Project Schedule	A detailed project schedule showing all major milestones to be submitted by the Service Provider.	Provide together with submission of bid.
[2] Payment Schedule	To be submitted by the Service Provider.	Provide together with submission of bid.
[3] VAT Registration	To be submitted by the Service Provider.	Provide together with submission of bid.
[4] Tax Clearance	To be submitted by the Service Provider.	Provide together with submission of bid.
[5] BBBEE Certificate	To be submitted by the Service Provider.	Provide together with submission of bid.
[6] Company Profile	To be submitted by the Service Provider.	Provide together with submission of bid.
[7] Health and Safety file	To be submitted by the Service Provider to show compliance to the OHSA.	Prior to commencement of works.
[8] Work Permit	The work permit shall be issued to the Service Provider before commencement of works.	Prior to commencement of works.
[9] Confidentiality Agreement	Necsa to supply the Service Provider with a template to complete. The form shall be completed by all the employees to work on site.	Prior to commencement of works.
[10] Necsa Induction	All personnel are required to do the Necsa induction before commencing any works. [**Note:** Service Provider shall not be issued with access cards until the induction has been done.]	Prior to commencement of works.
[11] Quality Assurance	The Service Provider shall submit an approved quality procedure. A professional engineer should ensure quality results of every milestone.	Prior to commencement of works.

Requirement	Responsibility	Date
[12] INS-0800 License	This is an internal license agreement between the Service Provider, client and Necsa Licensing department, and necessary before all works commence.	Prior to commencement of works.
[13] COIDA Letter of Good Standing	To be submitted by the Service Provider.	Provide together with submission of bid.

7. NECSA RESPONSIBILITY AND ADDITIONAL REQUIREMENTS

In certain designated areas, electrical supply shall be provided for by Necsa. Necsa will also be responsible for the supply of a set of drawings with the baseline information. Necsa PES will endeavor to provide available information as required by the Contractor.

8. TESTING AND COMMISSIONING REQUIREMENTS

- Hydrostatic testing of the pipeline shall be done.
- Pipeline will be checked and inspected for any leakages.
- Tank leak test shall be done.
- Tank will be checked and inspected for any leakages.
- Site cleared of all debris and restored.

9. DOCUMENTATION UPDATE REQUIREMENTS

Emergency cooling water system drawings to be updated and revised when required. Operating manuals to be updated and revised when required. Operating instructions/manuals to be compiled.

10. SAFETY CLEARANCE CERTIFICATE

The NLM Senior Operator, Section Manager, PES Chief Engineer and Project Manager will sign the safety clearance certificate after the work is completed.

11. FAT OBJECTIVES

- To check whether the pumps and pipeline can deliver 18 m^3/hr as designed.
- To check that the level indicator operates appropriately to shutoff the pump when going for overflow protection.
- To check the tank can hold 15 m^3 of water.
- To check whether the new pipeline does not have a negative effect on the existing pipeline.
- To test that all installed valves, pressure gauge, strain gauge are performing as expected.