Classification:	OPEN

Document No.	**NLM-URT-21/007**
Rev. No.	**00**
Department/Section:	**NLM**
Title:	**USER REQUIREMENT SPECIFICATIONS FOR JAW CRUSHER FOR SMELTER PROJECT**

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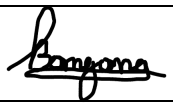
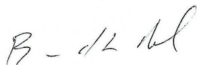
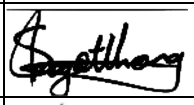
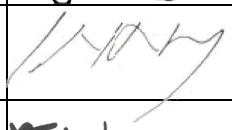
REVIEWED	SR MNGOMA **(Chief Engineer: Mechanical Engineering)**		12/11/2021
REVIEWED	BVDL NEL **(Chief Engineer: NLM)**		15/11/2021
ACCEPTED	LG MOGOTLHONG **(Project Manager: Smelter project)**		15/11/2021
ACCEPTED	W NTHO **(Manager: DS)**		16/11/2021
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Revisions

This document has been revised according to the following schedule:

Revision	Date Approved	Nature of Revision	Prepared by
00	See title page	First Issue	MKM RAMOTLOU

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1.0 INTRODUCTION

The jaw crusher is required to reduce waste size of the cooled solid waste slag(s), and low level nuclear waste, to smaller sizes particles, and then drummed so that it can comply with the acceptance & clearance criteria of the waste storage facility.
The user requirements specification (URS) will form part of the tender bid documents, and data sheet during procurement stage. The dust control extraction system will be venting dust at 4 m^3/s. (max)

2.0 PURPOSE

The purpose of this user requirement specification is to provide details of the requirements for Jaw Crusher design, manufacture and supply of a fully functional crusher, along with all its accessories. This equipment is required for crushing radioactive nuclear waste solid slag to 60mm particle size.

3.0 SCOPE

The scope of supply will be for jaw crusher design, design review & acceptance, developing a quality control plan, fabrication & manufacturing, factory acceptance test (FAT), supply to Necsa site, assembling & installation, functional testing, commissioning, and commissioning sign-off. The scope should also include training of operators and certification (if required and applicable).

Maintenance plan, commissioning spares, critical spares list and drawings i.e. assembly drawings; electrical drawing; instrumentation drawings; control systems drawings (hard copies & soft copies) should form part of this scope.

The above mentioned requirements in this document should satisfy and meet all the client's (Necsa) requirements including the jaw crusher ISO standard(s) and nuclear industry related ISO standards.

4.0 GENERAL REQUIREMENTS

- The jaw crusher will be required to reduce slag to smaller sizes particles for low-level nuclear waste slag.
- The jaw crusher should be equipped with a containment and extraction system.

5.0 DEFINITIONS

Jaw Crusher: Equipment to reduce solid slag particles into sizes particles of 60mm.

6.0 DESIGN COMPLIANCE

- The jaw crusher and related items must be designed to sound engineering and scientific practices and appropriate technical standards to ensure intended performance.
- Safety, human factors, maintenance, and other interfaces must be considered when designing the jaw crusher.
- Adhere to Occupational Health and Safety Act 85
- Jaw crusher ISO standard(s)
- Utilize the applicable nuclear industry related ISO standards
  - ISO 10648-1: Containment enclosures Part 1
  - ISO 10648-2: Containment enclosures Part 2
  - ISO 11933-1: Components for containment enclosures Part 1
  - ISO 11933-2: Components for containment enclosures Part 2
  - ISO 11933-3: Components for containment enclosures Part 3
  - ISO 11933-4: Components for containment enclosures Part 4
  - ISO 11933-5: Components for containment enclosures Part 5
  - ISO 146447-7: Clean rooms and associated controlled environments
  - ISO 17873: Nuclear facilities – criteria for the design and operation of ventilation systems other than nuclear reactors.

7.0 SPECIFICATIONS

7.1 CRUSHER

- 200*350mm Jaw Crusher, with ribbed liners
- Maximum feed size: 150mm
- Closed side setting: 30mm, top size 45mm.
- Capacity: 3-6 tph Motor power: 12kw
- Motor Voltage: 380 Volts
- Frame work will be made from 254x146x 31.30kg/meter universal beam.
- Up right columns will be made from 152 x 152 x 29, 8 Kg/m columns, each column will have a 12mm Base plate used for bolting frame work to the ground, as well as being used to level out framework.
- The clearance between the concrete work and the base plate will be pressure pack with non-shrink grout.
- The flooring around the “Jaw Crusher” Should be checkered plate 4 over 6,5mm material thickness suitable for a safe working area around the crusher, there will be enough room to create a suitable safe work area for maintenance on the crusher.
- Mentis design hand railing will be secured with bolts around the perimeter of the upper flooring to create a safe working environment, an access ladder will also be bolted to the frame work and built to code.
- The containment enclosure room/chamber should have closed dust extraction hood that tie-in onto an existing off-gas system (An enclosed dust extraction system that will be connected to the main plant off-gas system within the facility).

7.2 CRUSHER ENCLOSURE ROOM

7.2.1 Containment Enclosure Chamber

- Inspection window to show operation as well as control panel.
- The enclosed room is design and manufactured from clear panel that will be easily decommission and decontaminated
- There's an internal steel tube frame pre-built where the panelling will be anchored too.

7.2.2 Main Drum Lifting Frame

- The drum lifting design Should be designed with safety factor of 1,5 m height.
- The outer steel work will be made from a combination of 120x60 and 152x76 tapper flange channel as well as additional flame cut parts, it's made independently from the above frame work but is dependent on the frame work for its stability.
- The lifting frame will have two 12mm base plate one on each upright as well as two connector plates as well as additional structural bracing.
- The bin holder is designed to suit a standard 210 Lt drum as discussed, where it will be clamped and held steadily in place.
- The lifting part of this drum lifter is done by two double acting hydraulic cylinders both driven from a single but very efficient power pack (Power supply is 380V).
- The power pack should preferably be kept outside the Crusher room of operation, if possible, for access to annual service (Please advise if a zone 21 EX rated motor is required).
- Controls are two simple forward and reverse non latch switch wire inside a separate electrical control panel to suit the application.
- All Cleaves shafts, pivoting shafts and pinions have grease nipples for lubrication purposes.
- The lifting frame is anchored to the ground in the same fashion as the frame work above to keep all the correct heights as per the intended design.
- All slides and travels as well as tipping mechanism are made specifically to make to the tipping process as smooth and as dust free as possible.

7.2.3 Main Inlet and Discharge Hopper as well as Drum Trolley

- Main inlet hopper will be fabricated in such a way as to minimize dust from the tipping drum when it is being emptied.
- Allowing for direct dust extraction at the main inlet hopper.
- The discharge hopper must be made flexible to suit the inlet of the receiving drum.

- A wheeled trolley should be specifically fabricated and supplied only to travel in a straight line as to prevent the trolley from possibly falling over when turning. The trolleys soul purposed will be to move in and out the crushed room only.
- The trolley will be engineered to handle 1650Kg.

8.0 PLANT LAYOUT