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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	J. Methi

1. Purpose

1.1 This document serves as a User Requirement Specification for potential suppliers and contractors to understand Necsa NLM's Liquefied Petroleum Gas (LPG) supply needs and expectations for a sustainable and regulated usage at Area 26 Smelter Facility.

2. Introduction

2.1 This User Requirement Specification (URS) outlines the specific requirements for the bulk supply and infrastructure installation of (LPG) to ensure safe, efficient, sustainable, regulated, and reliable LPG supply to a burner.

2.2 The bulk supply of LPG shall be of propane industrial quality, of appropriate pressure and flow rate for a burner designed for high precise temperature control in the high-temperature application industry, high flame velocity, wide adjustment range, complete combustion, reliable performance, and high heat transfer efficiency for pre-heating of ladles during the smelting process.

3. Scope

3.1 The scope of supply shall include but not limited to the layout, design, detailing, manufacturing, corrosion protection, delivery, construction, testing, and commissioning, storage handling, distribution, and maintenance of an Industrial LPG Facility at the designated NLM Smelters area.

3.2 It shall also include initial bulk supply of the LPG after commissioning and acceptance by NECSA of the facility and periodic supply as and when required, and as stated in NECSA's NLM-REP-23/025 Annual LPG Gas Consumption for Ladle Pre-heater Document, for a total duration of 3 years.

3.3 It shall include the complete hand-over of facility, operation, maintenance, servicing, manuals and records including equipment manuals and records after the period of 3yrs of service for NECSA to take-over the full-ownership of the facility and for continuous operation should NECSA deem it necessary to do so.

3.4 The details of the scope shall include an above-ground storage vessel and associated vaporisers that will allow the liquefied gas to evaporate and feed the ladle station through thermosiphon process, control valves, shut valves, relief valves, online gas meter, gas filters, dispensers, gas equipment, pipework and fittings up to the inlet of the burner gas pipeline.

3.5 It also includes for concrete slabs, foundations and bunded walls.

3.6 It also includes access platforms or ladders if needed and required based on the supplier's design requirements.

3.7 It also includes for the fitting of automatic and other devices (operative in the event of physical damage to the installation) for the purpose of ensuring maximum security, for the storage of gas from a design point of view, and for limiting the escape of liquid through normal pressure relief fittings.

3.8 It also includes for provision of the 1.8m diamond mesh fencing with lockable gates.

3.9 It also includes for the couplings, branches, drain connections and vent pipes.

3.10 It also includes for the primary and emergency shut-off valves.

3.11 It shall also include installation of a leak detection system that can promptly identify and isolate any LPG leaks.

3.12 It also includes for the pressure relief valves.

3.13 It also includes for float arm and level indicator and a fixed level indicator.

3.14 It shall also for include drain and bleeding valves.

3.15 It shall also include for inlet spray line and other ancillaries like rain caps, etc.

3.16 It also includes temperature-measuring instruments.

3.17 It shall also include for an approved 3-coat corrosion protection system.

3.18 It also includes for an approved third-party initial inspection, testing and certification.

3.19 It shall include all other required and relevant equipment including safety equipment and warning notices required for safe operation of the facility.

3.20 It shall also include the supply of all equipment, valve and special material lists complete with the brochure indicating, make and technical specification of the equipment.

3.21 It shall also include provision of documentation and drawings proving compliance with all relevant LPG safety codes, standards, and permits.

3.22 It shall also include provision of a comprehensive training sessions for NECSA personnel, covering LPG safety protocols, emergency response, routine maintenance procedures, and operating procedures.

3.23 It shall also include provision of a preventive maintenance schedule with a clear plan for regular inspections and maintenance activities, including the replacement of critical components.

3.24 It shall also include an allowance by the supplier and contractor of period 5 days for medicals, inductions, and trainings prior to site establishment and an additional 1-day for exit medicals.

3.25 To be exclude from the cost is the medicals costs, these shall be performed at NECSA medical premises.

3.26 It shall also include for the submission by the supplier and contractor of the safety file that will contain a risk assessment, and approval period of 2-weeks by NECSA from date of submission.

3.27 It shall also include fixed and time related/hour rates costs for management, supervision, labour, plant, equipment, and tools for the duration of the construction period.

3.28 It shall also include a sum for the supply, fabrication and installation of pipe supports per kg, for an estimate of 300kg including u-bolts, chemical anchors, welding, and bolting. Selection of all material shall be done in way that will prevent galvanic corrosion i.e. carbon steel shall not be in contact with stainless steel, without isolation kits.

4. Technical Requirements

4.1 The scope of supply shall include but not limited to the layout, design, detailing, manufacturing, corrosion protection, delivery, construction, testing, and commissioning of the LPG facility at the designated NLM Smelters area.

4.2 The LPG shall be propane of **CAS Registry Number CAS-74-98-6** as uniquely identified and assigned by the Chemical Abstracts Service(CAS).

4.3 The supply of LPG shall comply to ASTM D1835 − 20 Standard Specification for Liquefied Petroleum (LP) Gases or Equivalent and the associated and Standards and Specifications for Practices and Testing Methods applicable to Commercial Propane.

4.4 The LPG supplied shall meet industry standards and specifications for purity, consistency, and quality for our intended application as indicated on the Tecflame High-Temperature Burner Brochure and P&ID and Instrument List attached and issued for information only.

4.5 All line piping shall comply to API Spec 5L, Specification for line piping.

4.6 The contractor is to consider the route and a working at height of 7m inside the building for the installation of the piping and drilling and installation of u-bolts as red-lined on the drawing 73-71-26-01A9003 attached under Appendix A below and therefore shall require access platform for installation.

4.7 The area black-marked on 73-71-26-01A9003 is the designated area for the installation of the LPG facility; the contractor is to consider the building wall and the regulations in their design layout.

4.8 All pressure vessels shall comply with ASME BPVC Section VIII Division 1, Boiler and pressure vessel code – Section VIII, Division 1.

4.9 The LPG shall be supplied at 100kPa to the combustion system.

4.10 The connection point to the combustion system shall be 25NB pipe.

4.11 The scope of Testing including pressure testing of pressure vessels shall be prior to release for dispatch to NECSA and after Installation.

4.12 Pressure Testing shall be witnessed by NECSA Representative, after all non-destructive examination results have been presented and accepted the 3rd party inspector.

4.13 An Authorised Third Party shall be appointed by the supplier for Inspections, Testing during both Manufacturing, and Installation.

4.14 The supplier is to include in their costs the costs for an Authorised Third Party Inspections.

4.15 The lowest maximum design temperature for a storage vessel shall be the maximum product filling temperature or 38 °C, whichever is the greater.

4.16 The minimum design temperature for a storage vessel shall be at least −20 °C.

4.17 All equipment, such as storage equipment, vaporizers, pumps, and pipelines, shall be electrically bonded and earthed.

4.18 A certificate of compliance for all electrical works shall be issued by a competent person as defined in the Electrical Installation Regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).

4.19 All piping, fittings, valves, components and connections shall be supplied with material certificates, indicating heat numbers for all materials, and shall be flanged Table D. All equipment shall be supplied with name plates, and shall be tagged, and that includes all valves. Direction of liquid and gas flow shall be indicated on all piping and all equipment to be installed.

4.20 All threaded fittings and connections shall be BSP.

4.21 Each pressure relief valve on a storage vessel shall be re-certified within a period of three years, and shall be sealed and stamped with the date of testing and the identification mark of the testing station.

4.22 All fittings shall be acceptable for use at the safe working pressure of the storage vessel.

4.23 All gaskets material and class shall be included in the design in line with the system pressure ratings.

4.24 Bolts, nuts and washers shall be hot-dipped galvanised.

4.25 All steelwork, storage vessel, pipework, fittings and ancillaries shall be sandblasted to Sa 2.5 prior to application of corrosion protection.

4.26 All welding of steel supports shall conform to AWS D1.1.

4.27 All welding shall be performed by certified and qualified welders; qualified and coded to the relevant and required standard, code and regulations.

4.28 Performance of NDT shall be performed by an experienced, competent and approved personnel with a minimum Level 2 certification; shall be recorded and proven to the applicable standards and codes.

4.29 Quality Control/ Inspection Test Plan shall be submitted by the supplier and contractor and approved by NECSA prior to commencement of activities.

4.30 Concrete bases, holding down bolts, mountings and supports shall be so designed that they comply with the requirements of the standard in accordance with which the storage vessel is designed to.

4.31 Where the storage vessel is to be positioned horizontally, fixed and sliding supports are to be provided for in the design of the bases and footings.

4.32 All equipment and pressure relief valves shall be appropriately and permanently marked with minimum serial number, pressure, and discharge rates.

4.33 The initial inspection, testing and certification of storage vessels shall be under the supervision of an approved inspection authority who shall furnish each storage vessel with a certificate providing the date of the test, the pressure at which the storage vessel was tested, any other data considered necessary, and the stamp of the approving authority.

4.34 Plate, securely attached in a visible place on the shell of the storage vessel, shall be permanently marked with at least the following information:

1. a) the manufacturer’s name;
2. b) the country of origin;
3. c) the year of manufacture;
4. d) the vessel’s serial number;

5. e) reference number, date and addition of the Health and Safety Standard;
6. f) the design pressure in pascals;
7. g) the minimum and maximum design temperature, in degrees Celsius;
8. h) the water capacity, in cubic metres;
9. i) a mark of an approved inspection authority or symbol of the manufacturer, as applicable, in accordance with the Pressure Equipment Regulations (PER) of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);

4.35 Applicable safety distances shall be specified in the design and complied with for an effective and hazard-free installation and operation.

4.36 The supplier and contractor shall comply with all relevant local, regional, and national regulations, codes, and safety standards pertaining to LPG supply, handling, and installation including notifications and approval from relevant authorities.

4.37 The supplier and contractor are to demonstrate in their submission knowledge of the relevant and applicable requirements (4.20) to qualify to tender.

4.38 The supplier must demonstrate minimum capacity as specified in the document NLM-REP-23/025 of The Annual LPG Gas Consumption for Ladle Pre-heater Station and the maximum capacity of monthly supply with the ability to scale up should there be an increase in demand.

4.39 A schedule indicating frequency of deliveries shall be issued by the supplier with flexibility for emergency deliveries when necessary.

4.40 Provision of a detailed pricing structure that includes clear breakdowns of the cost components, such as base price, transportation and any other relevant fees shall be submitted by the tenderer to qualify.

4.41 A price index mechanism, tying LPG pricing to a recognized commodity index, to ensure transparency and adjust pricing based on market fluctuation shall be included by the tenderer in their submission to qualify. The layout drawing shall indicate the safe positioning of the fire hydrant, spray nozzle and fire extinguishers.

4.42 As a service, the supplier shall maintain a 24/7 emergency contact point with a response time not exceeding 2-hours, available for reporting accidents, leaks, or supply disruptions.

4.43 The supplier shall as part of the layout and design outline a detailed procedures for responding to emergencies, including containment of leaks, evacuation protocols, and coordination with local emergency services.

4.44 Detailed records of all LPG transactions, maintenance activities, safety checks, and incidents in electronic and hard-copy formats shall be maintained and made available on request.

4.45 The supplier and contractor shall as a minimum requirement provide evidence of their experience, certifications, and a track record of successful LPG supply and installation projects.

4.46 A Level 3 schedule and programme shall be submitted in MS Projects indicating a detailed WBS at tender including all activities from design to acceptance of the facility and monthly service and maintenance schedule for the period and duration of the agreement/contract.

4.47 All Construction activities are to comply with NECSA's SHEQ-INS-0825 and The Occupational Health and Safety Act 83 of 1993.

4.48 The supplier and contractor shall indicate their exclusions, site requirements and NECSA's obligations and responsibilities in their tender submission for effective and efficient performance of their activities including site construction activities.

4.49 A Data Pack to be approved by NECSA prior to commencement of the works shall form part of the Handover Documentation on completion of the works.

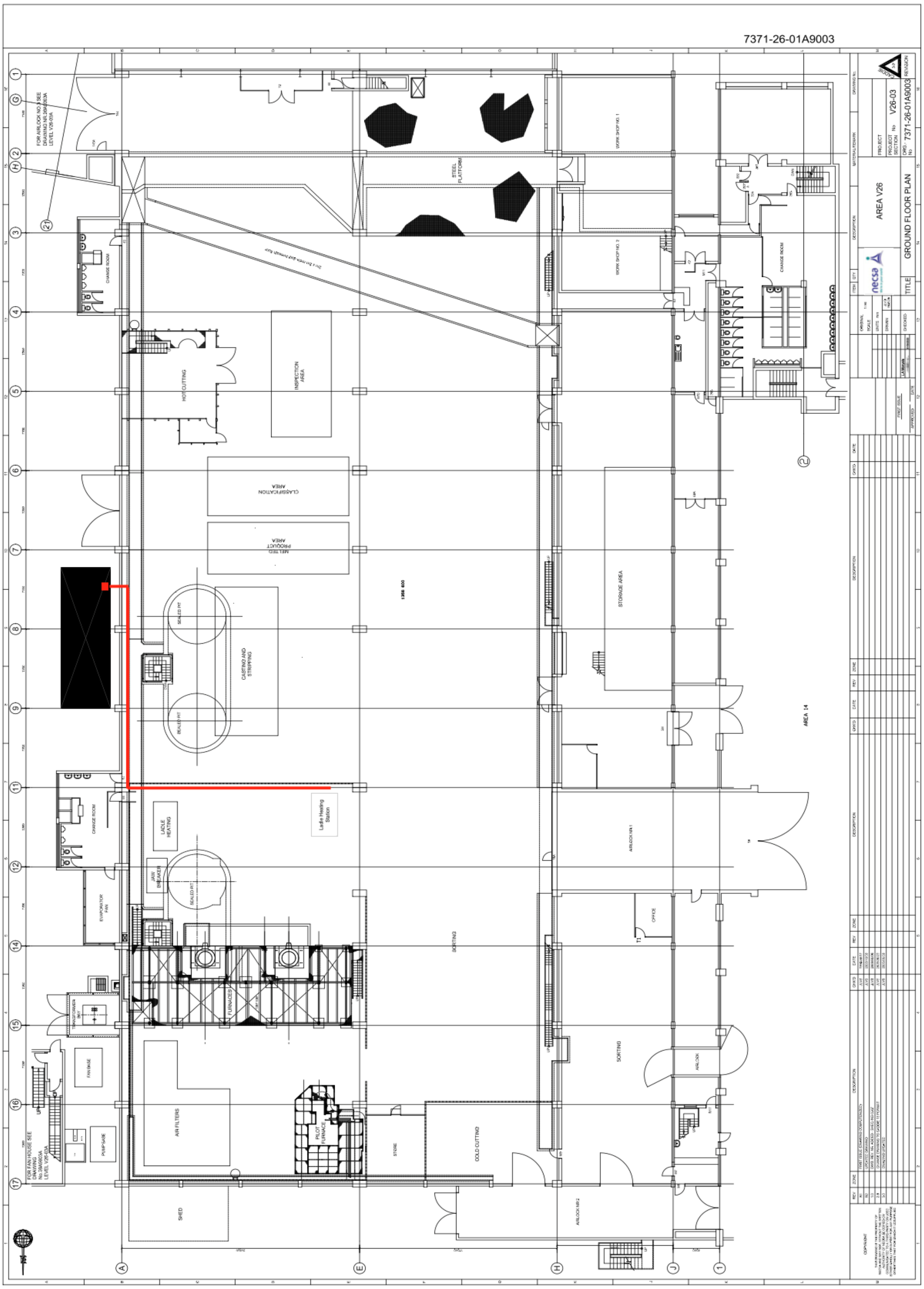
5. Applicable Reference Documentation

The following Documents form the Applicable Conditions for this scope of equipment and system that will comprise the supply agreement:-

a. NLM-REP-23/025 Annual LPG Gas Consumption for Ladle Pre-heater

b. Tecflame High-Temperature Burner Brochure (DYDTEC 10-HB008)
c. Instrumentation List
d. Drawing Number AL-ASS-001 Endeco PID
e. D1835 − 20 Standard Specification for Liquefied Petroleum (LP) Gases
f. SANS 10234 – List of classification and labelling of chemicals in accordance with Globally Harmonized System (GHS)
g. SANS 10087-3:2015 Edition 5
h. SHEQ-INS-0205: Document Numbering Requirements
i. SHEQ-INS-0206: Requirements for Document Control
j. SHEQ-INS-0207: Drawing Numbering Requirements
k. SHEQ-INS-0208: Requirements for Control of Records
l. SHEQ-INS-0233: Design Control
m. SHEQ-INS-0234: NECSA QMS Requirements for external design organisations
n. SHEQ-INS-0271: QMS requirement for the supply of quality class 2 products for nuclear installation
o. Necsa ‘s Alcohol and Drug Control Policy
p. Necsa ‘s Safety, Health and Environmental Policy
q. The National Building Regulations and Building Standards Act 103 of 1977
r. The Occupational Health and Safety Act 85 of 1993
s. ISO 9001:2015: Quality Management System Requirements
t. NECSA’s Requirements for Quality Management

Appendix A



7371-26-01A9003
AREA V26
GROUND FLOOR PLAN
V26-03