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RFQ Number	NLM-KWT-23/004
Request for Quotation Date	2023-06-09
RFQ Closing Date	2023-06-16
RFQ Closing Time	10:00
Site Briefing	Supplier can request to come to site. Necsa Area 26 building
Contact Person	Thiathu Munyai- 0829377983
Quotation Validity	90 Days from the closing date
Submission Details	RFQ Response must be sent to: Catherine.Matima@necsa.co.za
RFQ Description	Bulk supply of Liquid Petroleum gas for gas station at Smelter Facility

Dear Service Provider

Kindly provide a quotation for goods and or services as outlined in section 2 of this document.

1. Introduction

The South African Nuclear Energy Corporation Limited (Necsa) is a state-owned public company (SOC), registered in terms of the Companies Act, (Act No. 61 of 1973), registration number 2000/003735/06.

The Necsa Group engages in commercial business mainly through its wholly-owned commercial subsidiaries: NTP Radioisotopes SOC Ltd (NTP), which is responsible for a range of radiation-based products and services for healthcare, life sciences and industry, and Pelchem SOC Ltd (Pelchem), which supplies fluorine and fluorine-based products. Both subsidiaries, together with their subsidiaries, supply local and global markets, earning valuable foreign exchange for South Africa and are among the best in their field in their respective world markets.

Necsa's safety, health, environment and quality policies provides for top management commitment to compliance with regulatory requirements of ISO 14001, OHSAS 18001 and RD 0034 (Quality and Safety Management Requirements for Nuclear Installations), ISO 9001 and ISO 17025.

Necsa promotes the science, technology and engineering expertise of South Africa and improves the public understanding of these through regular communications at various forums and outreach programmes to the community. We are a proudly South African company continuously striving, and succeeding in many respects, to be at the edge of science, technology and engineering related to the safe use of nuclear knowledge to improve our world.

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For more information on Necsa, please visit: www.necsa.co.za

2. Scope of Work

This Scope of Work (SOW) describes the services to be provided by the Supplier for the supply, deliver, installation, perform final inspection and commissioning of the LPG gas station infrastructure and supply and offload of bulk liquefied petroleum gas (LPG) as per requirements specified in the report: NLM-REP-23-025 on continuous basis. The Supplier shall provide all necessary equipment and services required to complete the installation and bulk supply of the LPG and the LPG gas station. The LPG gas station's construction and installation is to comply with all the SANS statutory requirements for LPG gas.

NO.	Item Description	Quantity
1.	Supply, install and commission a 4.5m ³ LPG bulk tank & dual regulator set	01
2.	Auto shut off valve, gas detector and panel	01
3.	300m pipeline to 1x outlet point.	01
4.	LPG gas supply as per Annual LPG Gas Consumption for Ladle Pre-heater Station Report – NLM-REP-23-025	
5.	<u>Services</u> The Supplier shall provide the following services: • Design and install the LPG Gas Station according to the specifications provided on NLM-REP-23-025 • Provide all necessary equipment, materials and supplies for the installation and bulk supply of the LPG Gas Station. • Supply the LPG Gas Station with bulk fuel as specified in NLM-REP-23-025 • Provide training and technical support for the LPG Gas Station. • Provide on-going maintenance and support for the LPG Gas Station.	
6.	<u>Deliverables</u>	

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	- A written report detailing the on-going maintenance and support provided for the LPG Gas Station. - Installation of LPG equipment, including all necessary fittings and connections.	
7.	<u>Confidentiality</u> Both parties agree to maintain the confidentiality of all information.	
8.	<u>Date of briefing and venue</u>	

3. Pricing

- All price quoted to include all applicable taxes.
- Price must be fixed and firm
- Price should include additional cost elements such as freight, insurance until acceptance, duty where applicable, disbursements etc.
- Quotation must be completed in full, incomplete quote could result in a quote being disqualified.
- Payment will be according to Necsa's General Conditions of Purchase.

4. Evaluation

4.1. Phase 1- Functionality Evaluation / Technical Evaluation

Where functional or technical evaluation criterion is applicable, assessment will be performed in terms of the criterion listed below and the criterion may include Technical, Performance, Quality and Risk.

If the Bidder's response to the Technical templates does not indicate that the Bidder can support an acceptable technical solution, the Bidder's response will be rejected and not evaluated further.

Together the Technical, Performance & Quality and Risk criteria make up the functionality criterion and a Bidder's Proposal will be evaluated for functionality out of a possible 100 points. Only RFQ responses achieving an evaluation score of greater than the set threshold points out of the possible 100 points and which score a number of points for functionality that is greater than or equal to the set threshold points of the number of points achieved by the highest scoring Bid for functionality will be selected to progress to the second stage.

4.2. Phase 2 - Evaluation In Terms Of Preferential Procurement Policy Framework Act, 2022

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This bid will be evaluated and adjudicated according to the 80/20 point system, in terms of which a maximum of 80 points will be awarded for price and 20 points will be allocated based on the specific goals (B-BBEE status level).

	POINTS
PRICE	80
SPECIFIC GOALS (B-BBEE status level)	20
Total points for Price and SPECIFIC GOALS	100

Preference goal

B-BBEE status level contributor

B-BBEE Status Level of Contributor	Number of points (80/20 system)
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

5. Required Documentation

- Tax Clearance Certificate (Tax pin issued by SARS)
- Declaration of interest (SBD 4)
- BEE Certificate / Applicable Affidavit if classified as EME
- Letter of Good Standing (COID) only if Applicable due to the nature of work required
- Any other document or certification that might have been requested on this RFQ

6. Important

- 6.1. Quotation must be submitted on or before the RFQ closing date and time stated above.

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- 6.2. Orders above R 30 000 will be evaluated according to the PPPFA 80/20-point system and a functionality scorecard where applicable and the ones above R 1 Million will be subjected to the tender process.
- 6.3. This RFQ is subjected to the Necsa's General Conditions of Purchase, Preferential Procurement Policy Framework Act 2000 and the Preferential Procurement Regulations, 2022, the General Conditions of Contract (GCC) and, if applicable, any other legislation or special conditions of contract
- 6.4. Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for specific goals are not claimed.
- 6.5. The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to specific goals, in any manner required by the purchaser.
- 6.6. For a Bidder to obtain clarity on any matter arising from or referred to in this document, please refer queries, in writing, to the contact details provided above. Under no circumstances may any other employee within Necsa be approached for any information. Any such action might result in a disqualification of a response submitted in competition to this RFQ.
- 6.7. No goods and/or services should be delivered to Necsa without an official Necsa Purchase order.
- 6.8. Necsa reserves the right to; cancel or reject any quote and not to award the RFQ to the lowest Bidder or award parts of the RFQ to different Bidders, or not to award the RFQ at all.
- 6.9. The supplier shall under no circumstances offer, promise or make any gift, payment, loan, reward, inducement, benefit or other advantage, which may be construed as being made to solicit any favour, to any Necsa employee or its representatives. Such an act shall constitute a material breach of the Agreement and the Necsa shall be entitled to terminate the Agreement forthwith, without prejudice to any of its rights
- 6.10. By responding to this request, it shall be construed that: the bidder, hereby acknowledge to be fully conversant with the details and conditions set out in the Necsa's General Conditions of Purchase, Preferential Procurement Policy Framework Act 2000 and the Preferential Procurement Regulations, 2022, the General Conditions of Contract (GCC), Technical Information and Specifications attached, and hereby agree to supply, render services or perform works in accordance therewith

EVALUATION CRITERIA

Pre-qualification				
Proof of registration with CSD (central supplier database)				
Tax pin issued by SARS				
Functional Evaluation				
Item	Requirement	Weight	Points	Criteria
1	Public Liability insurance Suppliers to submit public liability insurance certificate from their insurance company	30	30	The supplier has submitted proof of insurance for public liability
			0	The supplier has no public liability insurance cover
3	Bulk station commisioning The supplier to provide the duration on the supply,install and commision a 4,5m3 LPG bulk tank & dual regulator set	30	30	The time it will take to have a fully working gas station is less than 12 weeks
			15	The time it will take to have a fully completed working gas station is > 12 weeks but < 14 weeks
			0	The time it will take to have a fully working gas station is > 14 weeks
5	Track Record / Company Experience	40	40	Provide proof of five (5) or more relevant reference with contact details of the clients (name of client, telephone number and/or email address) and value of contract
			20	Provide proof of four (4) relevant reference with contact details of the clients (name of client, telephone number and/or email address) and value of contract
			10	Provide proof of one-two (1 - 2) relevant reference with contact details of the clients (name of client, telephone number and/or email address) and value of contract.
			0	No relevant references submitted
Total		100		

IMPORTANT

Supplier will need to score a minimum of 80 points out of 100 in order to be evaluated further to price and preference points.

Failure to submit the documents listed in pre-qualification will lead to automatic disqualification.

Classification:

OPEN



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Rev. No.	00
Department/Section:	WM Smelter Facility
Title:	Annual LPG Gas Consumption for Ladle Pre-heater Station

Authorization

	NAME	SIGNED
PREPARED	NC Kekana (Engineer in Training: WM Decontamination Services)	<i>NC Kekana</i> 21/02/2023
REVIEWED	B Raphotle (Scientist)	<i>BR</i> 17/02/2023 13:45:05(UTC+02:00) Signed by Blessed Raphotle, blessed.raphotle@necsa.co.za
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REVIEWED	MKM Ramotlou (Technician)	<i>MKM</i> 17/02/2023 13:47:33(UTC+02:00) Signed by Matome Ramotlou, matome.ramotlou@necsa.co.za
REVIEWED	S Mngoma (Chief Engineer)	<i>S Mngoma</i> 17/02/2023 15:38:25(UTC+02:00) Signed by Sibongiseni Mngoma, Sibongiseni.mngoma@necsa.co.za
ACCEPTED	T Munyai (Section Head: WM Smelter Facility)	<i>T Munyai</i> 21/02/2023 08:23:46(UTC+02:00) Signed by Thabthu Munyai, thabthu.munyai@necsa.co.za
APPROVED	W Ntho (Manager: WM Decontamination services)	<i>W Ntho</i> 21/02/2023 12:00:30(UTC+02:00) Signed by William Ntho, william.ntho@necsa.co.za

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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	N Kekana

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Annual LPG Gas Consumption for Ladle Pre-heater Station

1.0 PURPOSE

The purpose of this document is to provide the annual LPG gas consumption rate for the ladle pre-heater station at Area 26 Smelter Facility.

2.0 SCOPE

The document covers the calculations for the amount of LPG gas consumed annually by the Tecflame burner at the ladle pre-heater station.

3.0 REFERENCES

The following are referenced in this document:

- [1] Alsoufi, M. S. (2016). *Dr. Economical and Technical Way of Ladle Pre-heating by the Use of Flameless Oxyfuel (HDS/LPG) Gas in the Steel Industry*, 6.
- [2] Chapman, R. (2019, September 30). *Introduction to High Velocity Burners and Ladle Preheating*. Retrieved from FireBridgeInc: <https://www.firebridgeinc.com/blog/introduction-to-high-velocity-burners-and-ladle-preheating/>
- [3] NLM-SAR-08 001 Rev.03 Smelter Safety Assessment Report
- [4] Installation, dry-out, and sintering procedures for castables G-33
- [5] Tecflame High-Temperature Burner Brochure

4.0 DEFINITIONS AND ABBREVIATIONS

4.1 DEFINITIONS:

No definitions applicable.

4.2 ABBREVIATIONS:

LPG

Liquefied Petroleum Gas

5.0 THEORY [1][2]

In a foundry, a ladle is a vessel used to transport and pour out molten metal (Figure 1).

Casting ladles are used for pouring molten metal into the moulds meant for producing casting/cast products. It is important for the ladles to receive, transfer, and deliver the molten metal without letting the molten metal cool down below an unacceptable threshold. Material heat loss in a ladle below a certain point results in severe maintenance and repair issues, as well as product loss and wasted energy. To minimize molten metal cooling during pouring, the ladle must be as nearly as hot as the molten metal itself (Chapman, 2019). The ladles are lined with low cement castables. The refractory lining needs preheating, so that thermal shock and damage to the refractory lining and temperature drop in the ladle are minimized. The preheating of the ladle is usually performed with a gas-fired burner which injects a combustion flame into the interior of the ladle to the desired temperature between 1000°C and 1200°C. The temperature of

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the ladle during preheating can be measured and controlled using a thermocouple or pyrometer. Ladle preheating involves consumption of large quantity of fuel, such as natural gas or LPG gas (Alsoufi, 2016).



Figure 1: Molten metal pour out from ladle

5.1 LADLE HEATING PROCESS [2]

The ladle heating process consists of three main stages; drying, curing and preheating, as shown in Figure 2. Drying involves the removal of moisture from newly lined ladles. Curing is when the refractory lining is set. Lastly, preheating is when optimal ladle temperature is reached for use. While all these stages have slightly different needs, they all require temperature uniformity. In drying stages, uneven temperature distribution will result in retained moisture, which at later stages can be trapped and result in steam explosions. Uniform temperature distribution during the preheating stages and in ladle use will increase preheating efficiency and minimize heat loss from the molten steel. Therefore, it is essential that the burner systems in place for these stages can deliver heat to the entire ladle evenly [2]. The Tecflame high velocity gas burners offer a practical, cost effective approach to solving this problem.

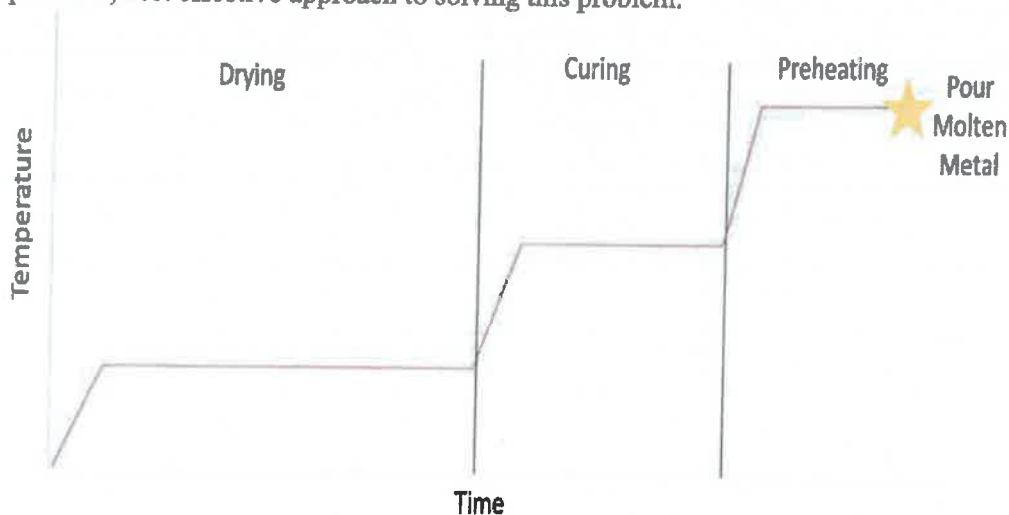


Figure 2: Ladle heating curve

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6.0 SMELTER FACILITY OPERATION DESCRIPTION

To account for system shut-down and maintenance the Smelter Facility will have a furnace availability of 90%, therefore, the furnaces will run for about 330 days per year. There will be three 8 hours-shifts per day. The furnace will require 4 hours to melt the material fully and bring it to the correct temperature [3], thus the ladles will require to be preheated approximately twice per shift. The new ladle refractory lining needs to be dried once, the dry-out schedule of the lining depends on its thickness, e.g. a 300 mm lining takes ~4 days (96 hours) [4]. Curing requires keeping the flame low for duration of 2 to 3 hours. Preheating the ladle must be done with a full flame touching up to the ladle bottom; the inside of the ladle must be dull red in colour (approx. temp 1200°C). This takes about 30 minutes to an hour. The Tecflame burner has an energy consumption rating of 1.5 – 2GJ/hr [5].

7.0 ANNUAL GAS CONSUMPTION CALCULATIONS

Annual number of ladle preheats:

$$2 \frac{\text{heats}}{\text{shift}} \times 3 \frac{\text{shifts}}{\text{day}} \times 330 \frac{\text{days}}{\text{year}} = 1980 \text{heats/year}$$

Assuming that preheating the ladle will take 30 minutes

$$1980 \frac{\text{heats}}{\text{year}} \times 0.5 \frac{\text{hr}}{\text{heat}} = 990 \text{hrs/year}$$

The amount of LPG gas required:

The specific calorific value of LPG gas is 46.1 MJ/kg or 94MJ/m³.

Therefore, the burner will consume

$$1.5 \frac{\text{GJ}}{\text{hr}} \times \frac{1000\text{MJ}}{1\text{GJ}} \times \frac{1\text{kg}}{46.1\text{MJ}} \approx 32.5\text{kg/hr of LPG}$$

Alternatively,

$$1.5 \frac{\text{GJ}}{\text{hr}} \times \frac{1000\text{MJ}}{1\text{GJ}} \times \frac{1\text{m}^3}{94\text{MJ}} \approx 16\text{m}^3/\text{hr of LPG}$$

The daily consumption of LPG gas by the ladle heater is approximately 98kg.

Thus, the annual LPG gas consumption is 32 175 kg per year.