RFQ Number	**NLM-QUO-24/078**
Request for Quotation Date	**23 April 2025**
RFQ Closing Date	**29 May 2025**
RFQ Closing Time	**17:00**
Compulsory Site Briefing	**Not compulsory but if more information required can be arranged**
Contact Person	**Catherine Matima**
Quotation Validity	**90 Days from the closing date**
Submission Details	**RFQ Response must be sent to:** catherine.matima@necsa.co.za
RFQ Description	To supply a liquid ring vacuum pump as per the attached specification sheet

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.

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

2. Background

Necsa plans to establish a plasma gasification demonstration facility in a laboratory on-site to volumetrically reduce uranium-containing PTFE candle filters. Gas generated in the facility must be routed from a quench H82019 in the reactor system (see Ref. 02 in Section 4) to a downstream KOH scrubber S83123 in the gas clean-up system (see Ref. 03 in Section 4). A liquid ring vacuum pump P83122 to be installed upstream of the scrubber will be used for gas transfer between the two systems. Details of the pump are given in the attached Specification Sheet (see Ref. 01 in Section 4).

3. Scope of Work

Item Description	Quantity
To supply a liquid ring vacuum pump, as per the attached Specification Sheet. All other equipment and components referenced in Section 2 are outside the scope of work considered here.	1

4. Attachments

Ref #	DOCUMENT NAME	DESCRIPTION
01	ENS-FDP-SPE-24028	Specification Sheet for Liquid Ring Pump P83122
02	ENS-FDP-PID-24002	PTFE Facility Destruction Project: P&ID Diagram – Reactor System 820
03	ENS-FDP-PID-24003	PTFE Facility Destruction Project: P&ID Diagram – KOH Scrubber System 831

5. 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.

6. Evaluation

6.1. **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.

The quotations will be evaluated according to the following selection criteria (based on information requested above):

Item	Requirement	Weight	Points	Criteria
1	ISO 9001: 2015 (or latest) accredited **Supplier must provide evidence (ISO 9001 certificate)**	30	30	ISO 9001 accreditation of supplier of the required products. **OR** ISO 9001 accreditation of OEM and OEM letter listing local supplier as authorised supplier and service agent
2	**Supplier must provide letter referencing after sales service and maintenance**	25	25	Supplier having a service and repair workshop Supplier holds critical spares as stock items
			15	Supplier having a service and repair workshop
			10	Supplier outsources service and repair
3	Supplier lead-time **Supplier must specify lead-time**	25	25	Product available within 4 weeks of issue of Purchase Order
			15	Product available within 6 weeks of issue of Purchase Order

Item	Requirement	Weight	Points	Criteria
			10	Product available within 8 weeks of issue of Purchase Order
4	**Suitability of Product**	20	20	Supplier adequately demonstrates how the recommended product meets the user's requirements or specifications
Total		**100**		

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

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-BBE 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

7. 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
- Supply pump data sheet and curves.

8. Important

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

8.2. 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.

8.3. 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

8.4. 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.

8.5. 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.

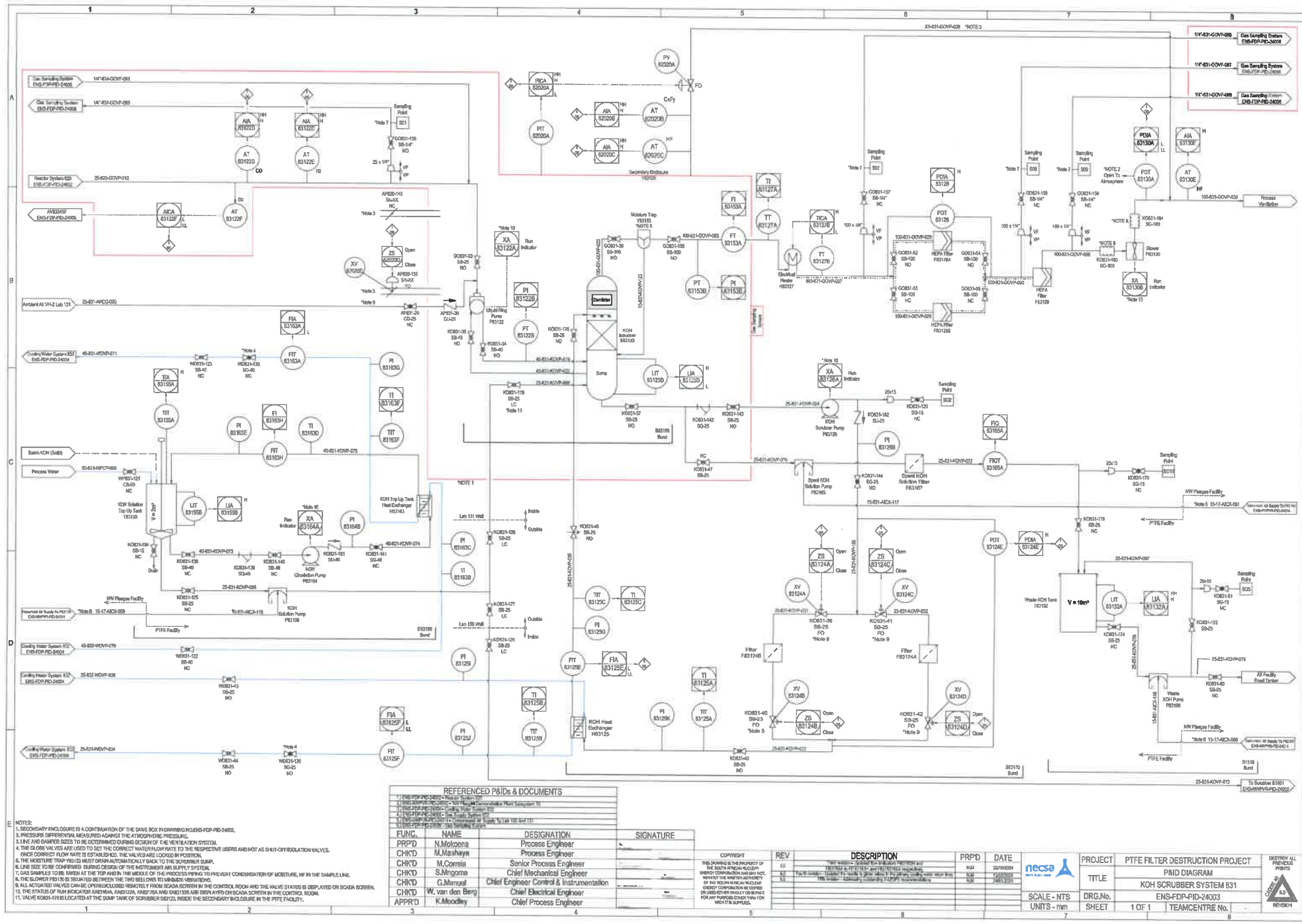
8.6. For a Bidder to obtain clarity on any matter arising from or referred to in this document, please refer queries, in writing, to the contact details provided above. Under no circumstances may any other employee within Necsa be approached for any information. Any such action might result in a disqualification of a response submitted in competition to this RFQ.

8.7. No goods and/or services should be delivered to Necsa without an official Necsa Purchase order.

8.8. 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.

8.9. 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

8.10. 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


REFERENCED P&IDs & DOCUMENTS
FUNC. | NAME | DESIGNATION | SIGNATURE
PRP'D | N.Mokoena | Process Engineer
CHK'D | M.Mashaya | Process Engineer
CHK'D | M.Correia | Senior Process Engineer
CHK'D | S.Mngoma | Chief Mechanical Engineer
CHK'D | G.Manual | Chief Engineer Control & Instrumentation
CHK'D | W. van den Berg | Chief Electrical Engineer
APPR'D | K.Moodley | Chief Process Engineer
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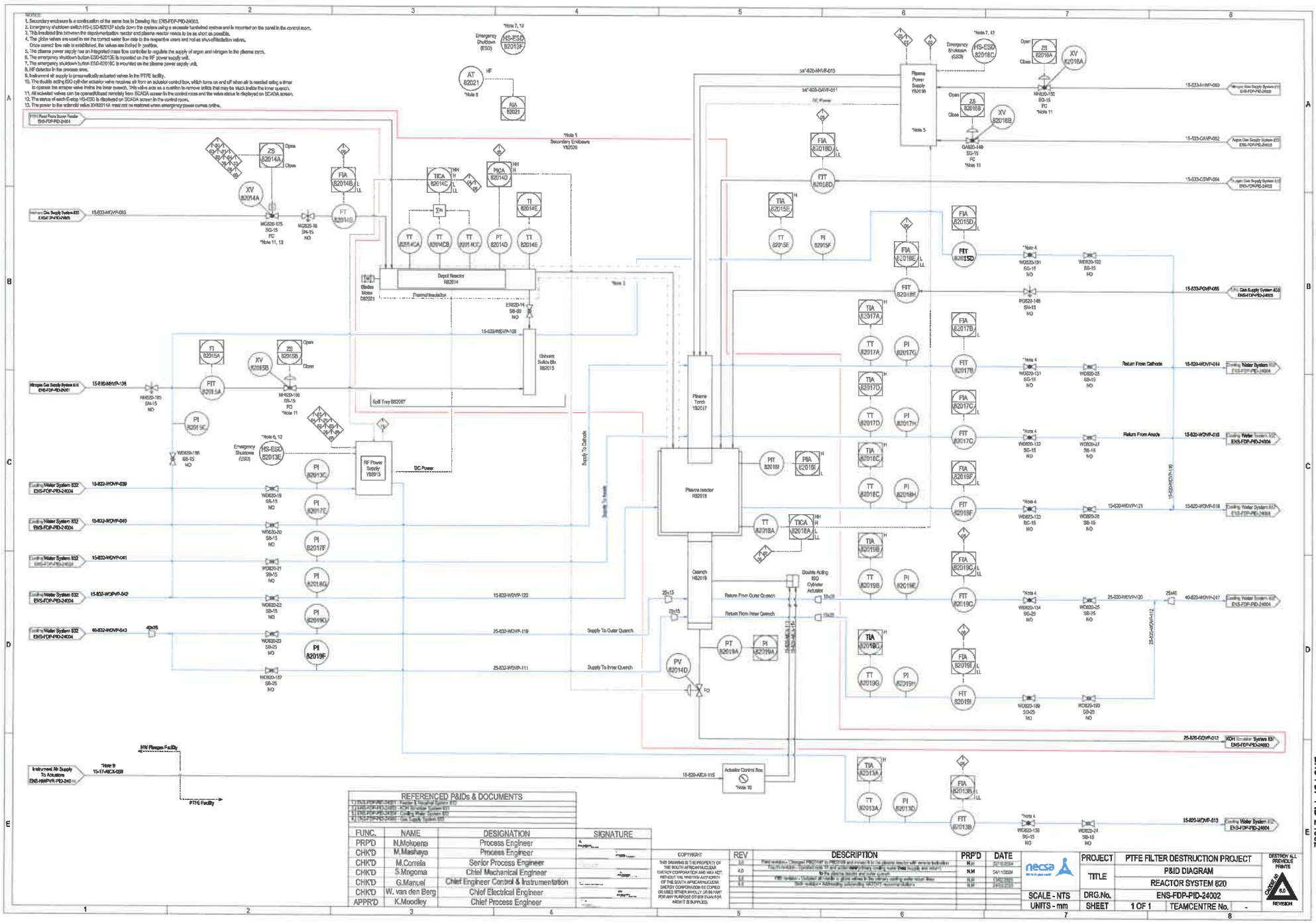
REV | DESCRIPTION | PRP'D | DATE
necsa
PROJECT | PTFE FILTER DESTRUCTION PROJECT
TITLE | P&ID DIAGRAM
KOH SCRUBBER SYSTEM 831
SCALE - NTS
UNITS - mm
DRG.No. | ENS-FDP-PID-24003
SHEET | 1 OF 1
TEAMCENTRE No.
DESTROY ALL PREVIOUS PRINTS
REVISION
ENS-FDP-PID-24003


NOTES:
1. Secondary enclosure is a continuation of the same box in Drawing No: ENS-FDP-PID-24003.
2. Emergency shutdown switch HS-ESD-B2013F shuts down the system using a separate hardwired system and is mounted on the panel in the control room.
3. This insulated line between the depolymerization reactor and plasma reactor needs to be as short as possible.
4. The globe valves are used to set the correct water flow rate to the respective users and not as shut-off/isolation valves. Once correct flow rate is established, the valves are locked in position.
5. The plasma power supply has an integrated mass flow controller to regulate the supply of argon and nitrogen in the plasma torch.
6. The emergency shutdown button ESD-B2013E is mounted on the RF power supply unit.
7. The emergency shutdown button ESD-B2016C is mounted on the plasma power supply unit.
8. HF detector in the process area.
9. Instrument air supply to pneumatically actuated valves in the PTFE facility.
10. The double acting ISO cylinder actuator valve receives air from an actuator control box, which turns on and off when air is needed using a timer to operate the scraper valve inside the inner quench. This valve acts as a cushion to remove solids that may be stuck inside the inner quench.
11. All isolated valves can be opened/closed remotely from SCADA screen in the control room and the valve status is displayed on SCADA screen.
12. The status of each E-stop HS-ESD is displayed on SCADA screen in the control room.
13. The power to the solenoid valve XVB2014A must not be restored when emergency power comes online.
Feed Flare Screw Feeder ENS-FDP-PID-24001
Emergency Shutdown (ESD)
HS-ESD B2013F
AT B2021
HF
AIA B2021
Plasma Power Supply YB2016
HS-ESD B2016C
ZS B2016A
XV B2016A
ZS B2016B
XV B2016B
FIA B2018D
FIT B2018D
TIA B2015E
TT B2015E
PI B2015F
FIA B2015D
FIT B2015D
FIA B2018E
FIT B2018E
TIA B2017A
TT B2017A
PI B2017G
FIA B2017B
FIT B2017B
TIA B2017D
TT B2017D
PI B2017H
FIA B2017C
FIT B2017C
TIA B2018C
TT B2018C
PI B2018H
FIA B2018F
FIT B2018F
TIA B2019B
TT B2019B
PI B2019E
FIA B2019C
FIT B2019C
TIA B2019D
TT B2019G
PI B2019H
FIA B2019I
FIT B2019I
TIA B2013A
TT B2013A
PI B2013D
FIA B2013B
FIT B2013B
ZS B2014A
XV B2014A
FIA B2014B
FT B2014B
TICA B2014C
PICA B2014D
TI B2014E
TT B2014CA
TT B2014CB
TT B2014CC
PT B2014D
TT B2014E
Depot Reactor RB2014
Thermal Insulation
Rotative Motor DB2021
ER620-14 SW-80 NO
Unburnt Solids Bin BB2015
Soil Tray BB2087
Plasma Torch YB2017
Plasma reactor RB2019
PIT B2018I
PIA E2018I
TT B2018A
TICA B2018A
Quench HB2019
Double Acting ISO Cylinder Actuator
PT B2019A
PI B2019A
PV B2014D
Actuator Control Box
RF Power Supply YB2013
ZS B2015B
XV B2015B
FI B2015A
FIT B2015A
PI B2015C
PI B2013C
PI B2017E
PI B2017F
PI B2018G
PI B2019G
PI B2019F
Supply To Cathode
Supply To Anode
Supply To Outer Quench
Supply To Inner Quench
Return From Outer Quench
Return From Inner Quench
Return From Cathode
Return From Anode
Secondary Enclosure YB2020
Nitrogen Gas Supply System B20 ENS-FDP-PID-24001
Instrument Air Supply To Actuators ENS-HWFVR-PID-24019
PTFE Facility
Cooling Water System B32 ENS-FDP-PID-24004
Argon Gas Supply System B33 ENS-FDP-PID-24005
Oxygen Gas Supply System B34 ENS-FDP-PID-24006
KOH Scrubber System B35 ENS-FDP-PID-24003
REFERENCED P&IDs & DOCUMENTS
1) ENS-FDP-PID-24001 - Feeder & Thermal System B10
2) ENS-FDP-PID-24003 - KOH Scrubber System B35
3) ENS-FDP-PID-24004 - Cooling Water System B32
4) ENS-FDP-PID-24005 - Gas Supply System B33
FUNC. | NAME | DESIGNATION | SIGNATURE
PRP'D | N.Mokoena | Process Engineer
CHK'D | M.Mashaya | Process Engineer
CHK'D | M.Correia | Senior Process Engineer
CHK'D | S.Mngoma | Chief Mechanical Engineer
CHK'D | G.Manuel | Chief Engineer Control & Instrumentation
CHK'D | W. van den Berg | Chief Electrical Engineer
APPR'D | K.Moodley | Chief Process Engineer
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REV | DESCRIPTION | PRP'D | DATE
4.0 | N.M | 04/11/2024
necsa
PROJECT | PTFE FILTER DESTRUCTION PROJECT
TITLE | P&ID DIAGRAM
REACTOR SYSTEM B20
SCALE - NTS
DRG.No. | ENS-FDP-PID-24002
UNITS - mm
SHEET | 1 OF 1 | TEAMCENTRE No. | -
DESTROY ALL PREVIOUS PRINTS
CHANGE 4.0 REVISION
ENS-FDP-PID-24002

ENGINEERING SERVICES DEPARTMENT

LIQUID RING VACUUM PUMP SPECIFICATION SHEET

necsa

Project	PTFE Filter Destruction Project	**Unit Tag Number**	P83122
Datasheet Document No.	ENS-FDP-SPE-24028	**Revision**	1.0
Description	The liquid ring pump form part of the scrubbing system. This is a rotating positive displacement pump with liquid under centrifugal force acting as a seal. Its function is to create a vaccum, transferring the process gas stream exiting the Quench (H82019) to the KOH scrubber (S83123). The liquid ring pump uses Potassium Hydroxide (KOH) solution as its operating fluid. The pump draws the liquid from the scrubber sump tank.		
Plant Location	Necsa, Pelindaba, North-West Province		
Equipment Location	PTFE Filter Destruction Facility - Process area inside Laboratory-131, Building V-H2		
Safety Classification	SC-2(C) and SC-3(N)		
Quality Classification	QC-2(C) and QC-3(N)		

FLUID PROPERTIES

	UNITS	GAS	LIQUID [Note 4]
Process fluid		CO_2, HF, H_2O, O_2, N_2, UF_6 [Note 1]	H_2O, KOH, KF, K_2CO_3, $KHCO_3$, UO_3 [Note 2]
Solids content		N/A	Possible undissolved UO_3,KF and/or KOH
Corrosive due to		HF	N/A
Operating temperature (Min/Max)	°C	35/45 [4]	35/45 [4]
Fluid molecular weight	kg/kmol	30,58 [3]	56,11 [8] Note3
Fluid density	kg/m^3	1 [7]	1268 [6]
Viscosity [6]	cP	0,015	0,018
Liquid vapour pressure	kPa (a)	N/A	2,3 [8] Note3

HYDRAULIC PROPERTIES

Volumetric Flow rate	m^3/hr	35 [7]	
Suction Presssure	kPa (a)	78 [7]	atmospheric
Discharge Pressure	kPa (a)	88 [7]	atmospheric
Relative Humidity	%	N/A	N/A
Capacity	kg/h	28 [5]	380 [6]
Capacity	Nm^3/h	21	N/A

MECHANICAL & ELECTRICAL PROPERTIES

Process Connections									
Gas inlet - Suction	**Size**	1" NPT [6],Page15	**Rating**	150#	**Flange Spec.**	SS,ASTM A182-F304/304L, ASME B16.5, RF			
KOH inlet - Suction	**Size**	1" NPT	**Rating**	150#	**Flange Spec.**	SS,ASTM A182-F304/304L, ASME B16.5, RF			
Discharge	**Size**	1" NPT	**Rating**	150#	**Flange Spec.**	SS,ASTM A182-F304/304L, ASME B16.5, RF			
Pump Direction	**Horizontal**	☑	**Vertical**	☐					
Electrical supply [6]	**kW**	1,5	**Volts**	400	**Phase**	3	**Hz**	50	
Noise Criteria	Maximum Allowable sound level at 1m distance not to exceed 85 dBA								
Seal Fluid	Potassium Hydroxide Solution (KOH) [Note 2]								
Material of Construction	**Casing**	Supplier to advise	**Impeller**	Supplier to advise					
	O Ring	Supplier to advise	**Base Frame**	Supplier to advise					
	Shaft	Supplier to advise	**Shaft Seal**	Supplier to advise					

VENDOR DATA REQUIRED WITH TENDER

1 **Pump technical data**	3 **Delivery Schedule**
2 **Utility Requirements**	4 **Pump dimensions with baseplate**

ENGINEERING SERVICES DEPARTMENT

LIQUID RING PUMP SPECIFICATION SHEET

Project	PTFE Filter Destruction Project	**Unit Tag Number**	P83122
Datasheet Document No.	ENS-FDP-SPE-24028	**Revision**	1.0

REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-FDP-PID-24003, KOH Scrubber System

[2] ENS-FDP-CLC-24016, Scrubber Design Calculation for the PTFE Destruction System

[3] ENS-FDP-CLC-24004, PTFE Filter Destruction Piping System Design Calculations - Line sizing

[4] ENS-FDP-CLC-24015, Energy Balance Calculation for the PTFE Destruction System

[5] ENS-FDP-CLC-24014, Mass Balance Calculation for the PTFE Destruction System

[6] ENS-FDP-CLC-24019, Pressure Balance across the PTFE Filter Destruction System

[7] ENS-FDP-REP-24035, Sizing of Pressure Control Valve PV82014D and Analytical Control Valve AV83345F

[8] Thermo Fisher Scientific (2010). Safety data sheet. [online] Available at https://www.fishersci.com/store/msds?partNumber=AA10979AP&productDescription=POT+HYDRX+AQ.+SOLN.+500ML&vendorId=VN00024248&countryCode=US&language=en [12-09-2024].

NOTES

Note 1: The composition of the gas entering the liquid ring pump is (w/w) : 53.59% CO_2, 28.74% HF, 7.80% H_2O, 5.86% O_2, 10.89% N_2, and 0.14% UF_6.

Note 2: The scrubber solution composition will change over time due to the chemical reactions taking place in the scrubber. The scrubbing process is divided into three phases. During the first phase, KOH will start decreasing, while KF and K_2CO_3 will start forming. At the end of this phase, the composition (w/w) of the scrubbing solution will be 66,81% water, 11,012% KF, 22,165% K_2CO_3 and approximately 13 ppm UO_3. At the end of the next phase, the solution composition will be 68,04% water, 16,62% KF, 15,27% $KHCO_3$ and approximately 19 ppm UO_3. At the end of the final phase, the composition will be 68,95% water, 18,30% KF, 12,729% $KHCO_3$ and approximately 21 ppm UO_3. At this point, the solution will be considered to be spent and will be replaced with a fresh batch of aqueous 30% KOH solution.

Note 3: The composition of scrubber solution changes over time. For the purposes of calculating solution physical properties, the composition at the start of a scrubbing cycle will be used, i.e. 30% (w/w)aqueous KOH.

Note 4: The "Gas" is the gas coming from the Quench. The "Liquid" is the liquid which the liquid ring pump draws from the sump.

	Name	Signature & Date
Compiled by	B Khumalo (Senior Process Engineer)	
Checked	MB Msane (Mechanical Engineer)	
Checked	M Correia (Senior Process Engineer)	
Checked	G Manuel (Chief C&I Engineer)	
Checked	S Mngoma (Chief Mechanical Engineer)	
Checked	W van den Berg (Chief Electrical Engineer)	
Approved	K Moodley (Chief Process Engineer)	
Distribution	1. ES Records 2. Docman 3. Dr K Moodley 4. Mr D Ngwenya	