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RFQ Number	NLM-QUO-24/079
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 centrifugal pumps as per the attached specification sheets

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,

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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. Centrifugal pumps are utilized in various applications within the facility. A total of five pumps are required as follows:

- i) Two pumps; P83239 A & B, to recirculate primary cooling water (demineralized water) from a central buffer tank, T83237, to various users in the facility. The water is then returned to the tank, after cooling in an external heat exchanger, H83236. At all times, one pump remains in operation, while the other is on standby.
Further detail of the pumps (P83239 A & B) is provided in Ref. 01 and Ref. 06 as per section 4 of this document.
- ii) One pump; P83235, to recirculate secondary cooling water (process water) from a cooling tower (T83234) through the heat exchanger (H83236) identified in (i) above, and back to the cooling tower, thereafter.
Further detail of pump P83235 is provided in Ref. 02 and Ref. 06 as per section 4 of this document.
- iii) One pump; P83126, to recirculate scrubbing liquid from the sump tank of a wet scrubber (S83123) through an external cooling loop and back to the top of the scrubber. The process commences with an aqueous solution containing 30% (w/w) potassium hydroxide as the scrubbing liquid, and the composition of the solution changes over time due to chemical reactions in the scrubber.
Further detail of pump P83126 is provided in Ref. 03 and Ref. 05 as per section 4 of this document.
- iv) One pump; P83164, to recirculate aqueous potassium hydroxide solution from a tank (T83155) through an external cooling loop and back into the tank. This process is carried out to prepare a fresh batch of the scrubbing liquid identified in (iii) above.
Further detail of pump P83164 is provided in Ref. 04 and Ref. 05 section 4 of this document.

3. Scope of Work

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Item Description	Quantity
To supply centrifugal pumps, as per the attached specification sheets. All other equipment and components identified and or/referenced in Section 2 are outside the scope of work considered here.	5

4. Attachments

Ref #	DOCUMENT NAME	DESCRIPTION
01	ENS-FDP-SPE-24018	Specification Sheet for Primary Water Pump P83239A & B
02	ENS-FDP-SPE-24019	Specification Sheet for Secondary Water Pump P83235
03	ENS-FDP-SPE-24020	Specification Sheet for KOH Scrubber Pump P83126
04	ENS-FDP-SPE-24021	Specification Sheet for KOH Circulation Pump P83164
05	ENS-FDP-PID-24003	PTFE Filter Destruction Project P&I Diagram – KOH Scrubber System 831
06	ENS-FDP-PID-24004	PTFE Filter Destruction Project P&I Diagram – Cooling Water System 832

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.

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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
			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		

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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-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

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 documents.

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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

ENGINEERING SERVICES DEPARTMENT						
Specification Sheet for Primary Water Pump P83239A & B						
Project	PTFE Filter Destruction Project				Unit Tag Number	P83239A & B
Datasheet Document No.	ENS-FDP-SPE-24018				Revision	2
Description	Pump P83239A or B is used to circulate cooling water, in the form of demineralised water, through the PTFE Filter Destruction Facility. Water is pumped from the primary cooling water tank (T83237) to a supply manifold (Y83238), from where it is distributed to various users in the plant. Downstream of the users, the water recombines via a return manifold (Y83233). It then passes through a plate-heat exchanger and is recirculated back into the primary tank. The demineralised water is supplied from and returns to the primary tank at 30 °C and 40 °C, respectively.					
Plant Location	NECSA, Pelindaba, North-West Province.					
Equipment location	PTFE Filter Destruction Facility - Outside Laboratory 131, north side of Building V-H2.					
Safety Classification	Non-classified(N) & SC-3 (C) ^[a]					
Quality Classification	Non-classified(N) & QC-3(C) ^[b]					
FLUID PROPERTIES						
Process fluid	Demineralised water.					
Solids content	Assumed to be zero due to strainer installed upstream of the pump.					
Corrosive due to	N/A					
PARAMETERS	UNITS	MINIMUM		NORMAL		MAXIMUM
Operating temperature	°C	18		30		60
Fluid density	kg/m ³	998		997		983
Viscosity	kg/m.s	8,63E-04		7,03E-04		4,48E-04
Liquid vapour pressure	kPa (a)	1,71		4,24		19,98
HYDRAULIC PROPERTIES						
PROPERTIES	UNITS	MINIMUM		NORMAL		MAXIMUM
Flow rate	m ³ /h	4,86		16,19		19,43
Pump inlet pressure	kPa (a)	108,83		94,73		88,16
Pump outlet pressure	kPa (a)	390,89		644,59		758,46
Pressure differential	kPa	282,06		549,86		670,30
Required Pump Head	m	28,81		56,22		69,51
NPSH available	m	10,70		9,26		8,59
GENERAL PROPERTIES						
Type of pump recommended	Centrifugal Pump					
Pump Direction	Horizontal: ☒			Vertical: ☐		
ELECTRICAL & GENERAL PROPERTIES						
Volts	Supplier to provide information.					
Phase	Supplier to provide information.					
Hz	Supplier to provide information.					
MECHANICAL PROPERTIES						
Type of seal	Mechanical ☒	Magnetic ☐	Stuffing box ☐	Dry run protection ☐		
Impellor material	Supplier to provide information.					
Pump Casing material	Supplier to provide information.					
Type of seal	Supplier to provide information.					
Shaft material	Supplier to provide information.					
PIPE NOZZLE						
Pipe Suction	Size	50 mm	Rating	150#	Flange Spec.	SS,ASTM A182-F304/304L,ASME B16.5, RF
Pipe Discharge	Size	50 mm	Rating	150#	Flange Spec.	SS,ASTM A182-F304/304L,ASME B16.5, RF
POWER						
Absorbed Power	Supplier to provide information.					
Installed Power	Supplier to provide information.					
Noise Criteria	Maximum Allowable sound level at 1m distance not to exceed 85 dBA.					

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ENGINEERING SERVICES DEPARTMENT		 necsa North Edenburg Nuclear Energy Corporation Ltd.	
Specification Sheet for Primary Water Pump P83239A & B			
Project	PTFE Filter Destruction Project	Unit Tag Number	P83239A & B
Datasheet Document No.	ENS-FDP-SPE-24018	Revision	2
VENDOR DATA REQUIRED WITH TENDER			
1. Pump performance curve 2. Pump duty 3. Pump efficiency 4. Pump rotational speed 5. Pump dimensions with baseplate			
REFERENCE DRAWINGS AND DOCUMENTS			
[1] ENS-FDP-PID-24004: Filter Destruction Project P&I Diagram – Cooling Water System 832.			
[2] ENS-FDP-REP-24034: Centrifugal Pumps Sizing Report for FDP Demonstration Facility.			
[3] ENS-FDP-CLC-24024: Centrifugal Pumps Sizing Calculations for FDP Demonstration Facility.			
NOTES AND ABBREVIATIONS			
[a] SC - Safety Class			
[b] QC - Quality Class			
[c] Supplier to advise on special requirements for installation of pump.			
Function	Name	Signature & Date	
Prepared	L Dlamini (Process Engineer)	 Signed by: L Dlamini Designated Authority Date: 2018-07-10	
Checked	MB Msane (Mechanical Engineer)	 Signed by: MB Msane Designated Authority Date: 2018-07-10	
Checked	B Khumalo (Senior Process Engineer)	 Signed by: B Khumalo Designated Authority Date: 2018-07-10	
Checked	S Mngoma (Chief Mechanical Engineer)	 Signed by: S Mngoma Designated Authority Date: 2018-07-10	
	G Manuel (Chief C&I Engineer)	 Signed by: G Manuel Designated Authority Date: 2018-07-10	
Checked	W van den Berg (Chief Electrical Engineer)	 Signed by: W van den Berg Designated Authority Date: 2018-07-10	
Approved	K Moodley (Chief Process Engineer)	 Signed by: K Moodley Designated Authority Date: 2018-07-10	
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ENGINEERING SERVICES DEPARTMENT				 necsa South African Nuclear Energy Corporation SOC Limited	
Specification Sheet for Secondary Water Pump P83235					
Project		PTFE Filter Destruction Project		Unit Tag Number	P83235
Datasheet Document No.		ENS-FDP-SPE-24019		Revision	1
Description		Pump P83235 is used to recirculate cooling water, in the form of process water, from the sump of cooling tower (T83260) through the plate-heat exchanger (H83236), and back to the cooling tower. The process water exits the cooling tower sump at 25 °C and returns at 35 °C.			
Plant Location		NECSA, Pelindaba, North-West Province.			
Equipment location		PTFE Filter Destruction Facility - Outside Laboratory 131, north side of Building V-H2.			
Safety Classification		Non-classified (N) & SC-3 (C) ^[a]			
Quality Classification		Non-classified (N) & QC-3 (C) ^[b]			
FLUID PROPERTIES					
Process fluid		Process water.			
Solids content		Assumed to be zero due to strainer installed upstream of the pump.			
Corrosive due to		N/A			
PARAMETERS	UNITS	MINIMUM	NORMAL	MAXIMUM	
Operating temperature	°C	18	25	60	
Fluid density	kg/m ³	998	997	983	
Viscosity	kg/m.s	8,63E-04	7,64E-04	4,48E-04	
Liquid vapour pressure	kPa (a)	1,71	3,17	19,98	
HYDRAULIC PROPERTIES					
PROPERTIES	UNITS	MINIMUM	NORMAL	MAXIMUM	
Flow rate	m ³ /h	4,85	16,17	19,41	
Pump inlet pressure	kPa (a)	92,38	83,38	79,09	
Pump outlet pressure	kPa (a)	219,66	300,22	335,31	
Pressure differential	kPa	127,27	216,84	256,22	
Required Pump Head	m	13,00	22,17	26,57	
NPSH available	m	9,12	8,2	7,75	
GENERAL PROPERTIES					
Type of pump recommended	Centrifugal Pump				
Pump Direction	Horizontal: ☒		Vertical: ☐		
ELECTRICAL & GENERAL PROPERTIES					
Volts	Supplier to provide information.				
Phase	Supplier to provide information.				
Hz	Supplier to provide information.				
MECHANICAL PROPERTIES					
Type of seal	Mechanical ☒	Magnetic ☐	Stuffing box ☐	Dry run protection ☐	
Impellor material	Supplier to provide information.				
Pump Casing material	Supplier to provide information.				
Type of seal	Supplier to provide information.				
Shaft material	Supplier to provide information.				
PIPE NOZZLE					
Pipe Suction	Size 50 mm	Rating 150#	Flange Spec.	CS,ASTM A105, ASME B16.5, RF	
Pipe Discharge	Size 50 mm	Rating 150#	Flange Spec.	CS,ASTM A105, ASME B16.5, RF	
POWER					
Absorbed Power	Supplier to provide information.				
Installed Power	Supplier to provide information.				
Noise Criteria	Maximum Allowable sound level at 1m distance not to exceed 85 dBA.				
VENDOR DATA REQUIRED WITH TENDER					
1. Pump performance curve		3. Pump efficiency		5. Pump dimensions with baseplate	
2. Pump duty		4. Pump rotational speed			

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ENGINEERING SERVICES DEPARTMENT			 necsa National Energy Development Corporation South African Nuclear Energy Corporation SOC Limited	
Specification Sheet for Secondary Water Pump P83235				
Project	PTFE Filter Destruction Project		Unit Tag Number	P83235
Datasheet Document No.	ENS-FDP-SPE-24019		Revision	1
REFERENCE DRAWINGS AND DOCUMENTS				
[1] ENS-FDP-PID-24004: Filter Destruction Project P&I Diagram – Cooling Water System 832.				
[2] ENS-FDP-REP-24034: Centrifugal Pumps Sizing Report for FDP Demonstration Facility.				
[3] ENS-FDP-CLC-24024: Centrifugal Pumps Sizing Calculations for FDP Demonstration Facility.				
NOTES AND ABBREVIATIONS				
[a] SC - Safety Class				
[b] QC - Quality Class				
[c] Supplier to advise on special requirements for installation of pump.				
Function	Name	Signature & Date		
Prepared	L Dlamini (Process Engineer)	 L. Dlamini Process Engineer 2024/05/15 14:45:00		
Checked	MB Msane (Mechanical Engineer)	 M.B. Msane Mechanical Engineer 2024/05/15 14:45:00		
Checked	B Khumalo (Senior Process Engineer)	 B. Khumalo Senior Process Engineer 2024/05/15 14:45:00		
Checked	S Mngoma (Chief Mechanical Engineer)	 S. Mngoma Chief Mechanical Engineer 2024/05/15 14:45:00		
	G Manuel (Chief C&I Engineer)	 G. Manuel Chief C&I Engineer 2024/05/15 14:45:00		
Checked	W van den Berg (Chief Electrical Engineer)	 W. van den Berg Chief Electrical Engineer 2024/05/15 14:45:00		
Approved	K Moodley (Chief Process Engineer)	 K. Moodley Chief Process Engineer 2024/05/15 14:45:00		
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ENGINEERING SERVICES DEPARTMENT					
Specification Sheet for KOH Scrubber Pump P83126					
Project	PTFE Filter Destruction Project			Unit Tag Number	P83126
Datasheet Document No.	ENS-FDP-SPE-24020			Revision	1
Description	Pump P83126 is used to recirculate the scrubbing solution from the sump tank of scrubber (S83123) through an external plate-heat exchanger (H83125) and back into the top of the scrubber. The KOH solution exits scrubber sump at 44 °C and returns at 35 °C.				
Plant Location	NECSA, Pelindaba, North-West Province.				
Equipment location	PTFE Filter Destruction Facility - Inside the process area of Laboratory 131, Building V-H2.				
Safety Classification	SC-3 (N) & SC-2 (C) Note [c]				
Quality Classification	QC-3 (N) & QC-2 (C) Note [d]				
FLUID PROPERTIES					
Process fluid	Liquid mixture consisting of H ₂ O, KOH, KF, K ₂ CO ₃ , KHCO ₃ and/or UO ₃ Note [a]				
Solids content	Strainer installed upstream of the pump, however, presence of small UO ₃ particles in fluid is possible.				
Corrosive due to	KOH (aq) and K ₂ CO ₃ (aq) .				
PARAMETERS	UNITS	MINIMUM	NORMAL	MAXIMUM	
Operating temperature	°C	18	44	60	
Fluid density	kg/m ³	1288	1272	1266	
Viscosity	kg/m.s	1,50E-03	1,25E-03	1,20E-03	
Liquid vapour pressure	kPa (a)	0,93	9,07	10,93	
HYDRAULIC PROPERTIES					
PROPERTIES	UNITS	MINIMUM	NORMAL	MAXIMUM	
Flow rate	m ³ /h	1,29	4,29	5,14	
Pump inlet pressure	kPa (a)	97,11	91,74	89,24	
Pump outlet pressure	kPa (a)	296,07	323,50	336,72	
Pressure differential	kPa	198,95	231,76	247,48	
Required Pump Head	m	15,74	18,57	19,93	
NPSH available	m	5,69	5,27	5,07	
GENERAL PROPERTIES					
Type of pump recommended	Centrifugal Pump				
Pump Direction	Horizontal: ☒		Vertical: ☐		
ELECTRICAL & GENERAL PROPERTIES					
Volts	Supplier to provide information.				
Phase	Supplier to provide information.				
Hz	Supplier to provide information.				
MECHANICAL PROPERTIES					
Type of seal	Mechanical ☒	Magnetic ☐	Stuffing box ☐	Dry run protection ☐	
Impellor material	Supplier to provide information.				
Pump Casing material	Supplier to provide information.				
Type of seal	Supplier to provide information.				
Shaft material	Supplier to provide information.				
PIPE NOZZLE					
Pipe Suction	Size 40 mm	Rating 150#	Flange Spec.	SS,ASTM A182-F304/304L,ASME B16.5, RF	
Pipe Discharge	Size 40 mm	Rating 150#	Flange Spec.	SS,ASTM A182-F304/304L,ASME B16.5, RF	
POWER					
Absorbed Power	Supplier to provide information.				
Installed Power	Supplier to provide information.				
Noise Criteria	Maximum Allowable sound level at 1m distance not to exceed 85 dBA.				

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ENGINEERING SERVICES DEPARTMENT		 South African Nuclear Energy Corporation SOC Limited	
Specification Sheet for KOH Scrubber Pump P83126			
Project	PTFE Filter Destruction Project	Unit Tag Number	P83126
Datasheet Document No.	ENS-FDP-SPE-24020	Revision	1
VENDOR DATA REQUIRED WITH TENDER			
1. Pump performance curve		4. Pump rotational speed	
2. Pump duty		5. Pump dimensions with baseplate	
3. Pump efficiency			
REFERENCE DRAWINGS AND DOCUMENTS			
[1] ENS-FDP-PID-24003: Filter Destruction Project P&I Diagram – KOH Scrubber System 831.			
[2] ENS-FDP-REP-24034: Centrifugal Pumps Sizing Report for FDP Demonstration Facility.			
[3] ENS-FDP-CLC-24024: Centrifugal Pumps Sizing Calculations for FDP Demonstration Facility.			
NOTES AND ABBREVIATIONS			
[a] The sump tank of scrubber S83123 will be charged with a batch of aqueous 30% KOH solution at the start and this solution will then be recirculated through the heat exchanger H83125 during the scrubbing process. 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 start forming. At the end of this phase, the composition of the scrubbing solution will be 66.81% water, 11.01% KF, 22.16% K_2CO_3 and approximately 13 ppm UO_3. At the end of the next phase, the solution composition of the scrubbing solution 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 solution composition will be 68.95% water, 18.30% KF, 12.72% $KHCO_3$ and approximately 21 ppm UO_3. At this point, the solution will be replaced with a fresh batch of aqueous 30% KOH solution. All solids are dissolved in the solution, with the exception of some possible precipitation of $KHCO_3$. The precipitate will be captured by the filters in the recycle.			
[b] KOH - Potassium Hydroxide			
[c] SC - Safety Class			
[d] QC - Quality Class			
[e] wt. % - Mass Fraction Percentage			
[f] Supplier to advise on special requirements for installation of pump.			
[g] H_2O - Water			
[h] KF - Potassium Fluoride			
[i] K_2CO_3 - Potassium Carbonate			
[j] $KHCO_3$ - Potassium Bicarbonate			
[k] - UO_3 - Uranium Trioxide			

ENGINEERING SERVICES DEPARTMENT		 necsa South African Nuclear Energy Corporation SOC Limited	
Specification Sheet for KOH Scrubber Pump P83126			
Project	PTFE Filter Destruction Project	Unit Tag Number	P83126
Datasheet Document No.	ENS-FDP-SPE-24020	Revision	1
Function	Name	Signature & Date	
Prepared	L Dlamini (Process Engineer)	 Signed by: L Dlamini, Process Engineer Date: 2020-05-14 10:00:00	
Checked	MB Msane (Mechanical Engineer)	 Signed by: MB Msane, Mechanical Engineer Date: 2020-05-14 10:00:00	
Checked	B Khumalo (Senior Process Engineer)	 Signed by: B Khumalo, Senior Process Engineer Date: 2020-05-14 10:00:00	
Checked	S Mngoma (Chief Mechanical Engineer)	 Signed by: S Mngoma, Chief Mechanical Engineer Date: 2020-05-14 10:00:00	
	G Manuel (Chief C&I Engineer)	 Signed by: G Manuel, Chief C&I Engineer Date: 2020-05-14 10:00:00	
Checked	W van den Berg (Chief Electrical Engineer)	 Signed by: W van den Berg, Chief Electrical Engineer Date: 2020-05-14 10:00:00	
Approved	K Moodley (Chief Process Engineer)	 Signed by: K Moodley, Chief Process Engineer Date: 2020-05-14 10:00:00	
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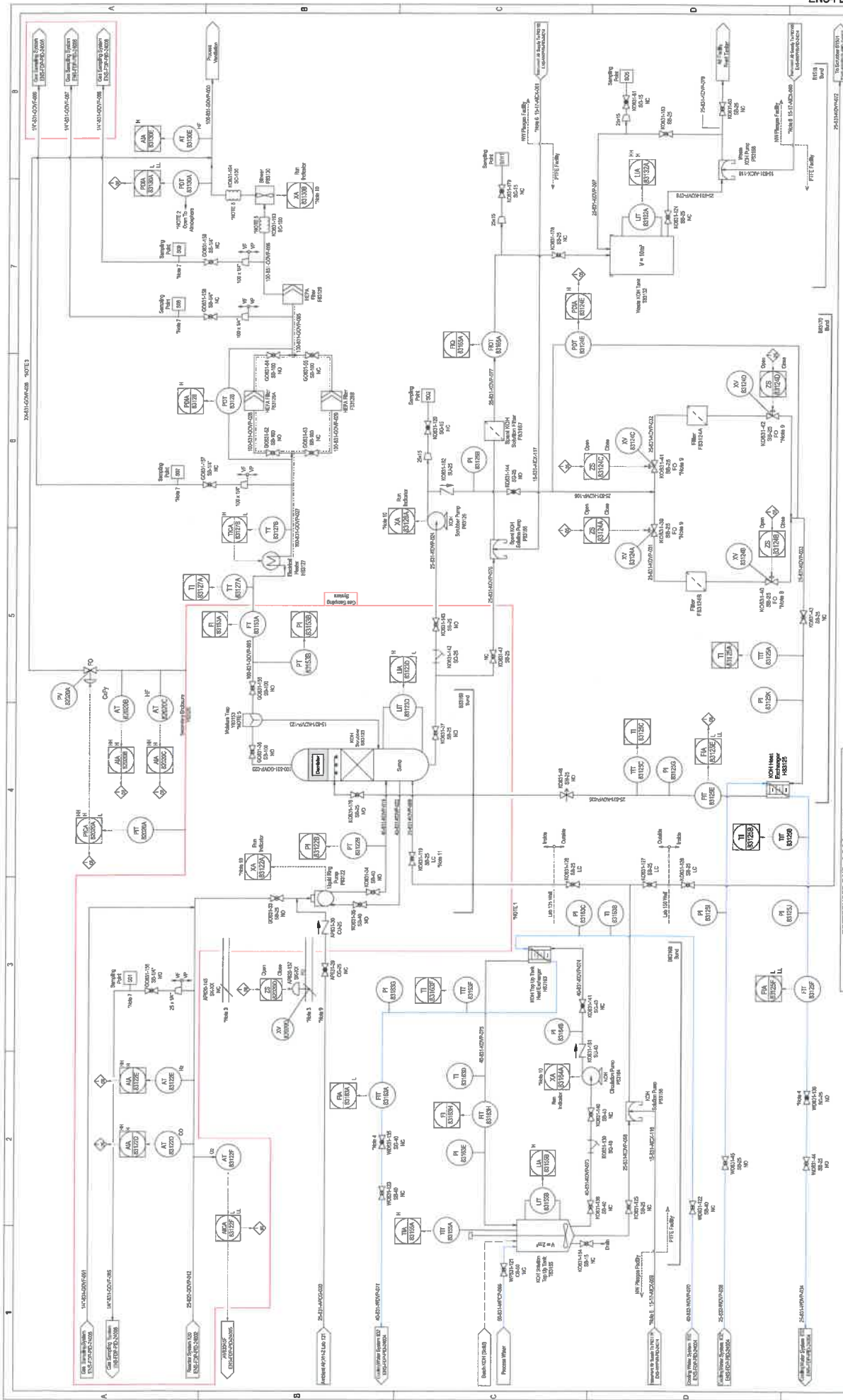
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ENGINEERING SERVICES DEPARTMENT				 South African Nuclear Energy Corporation SOC Limited	
Specification Sheet for KOH Circulation Pump P83164					
Project	PTFE Filter Destruction Project			Unit Tag Number	P83164
Datasheet Document No.	ENS-FDP-SPE-24021			Revision	1
Description	Pump P83164 is used to recirculate aqueous KOH solution from the make-up tank T83155 during the mixing process, through a plate-heat exchanger H83163 and back into the tank. The KOH solution exits tank T83155 at 45 °C and returns at 33 °C.				
Plant Location	NECSA, Pelindaba, North-West Province.				
Equipment location	PTFE Filter Destruction Facility - Outside Laboratory 131, north side of Building V-H2.				
Safety Classification	Non-classified (N) & SC-3 (C) ^[b]				
Quality Classification	Non-classified (N) & QC-3 (C) ^[c]				
FLUID PROPERTIES					
Process fluid	0 - 30 wt. % KOH solution in water.				
Solids content	Strainer is installed upstream of the pump, however, presence of undissolved KOH particles is possible.				
Corrosive due to	KOH (aq).				
PARAMETERS	UNITS	MINIMUM	NORMAL	MAXIMUM	
Operating temperature	°C	18	45	60	
Fluid density	kg/m ³	1288	1272	1266	
Viscosity	kg/m.s	1,50E-03	1,25E-03	1,20E-03	
Liquid vapour pressure	kPa (a)	0,93	9,07	10,93	
HYDRAULIC PROPERTIES					
PROPERTIES	UNITS	MINIMUM	NORMAL	MAXIMUM	
Flow rate	m ³ /h	1,24	4,12	4,94	
Pump inlet pressure	kPa (a)	118,09	115,33	113,95	
Pump outlet pressure	kPa (a)	227,94	240,01	245,82	
Pressure differential	kPa	109,84	124,68	131,87	
Required Pump Head	m	8,69	9,99	10,62	
NPSH available	m	9,02	8,83	8,73	
GENERAL PROPERTIES					
Type of pump recommended	Centrifugal Pump				
Pump Direction	Horizontal: ☒		Vertical: ☐		
ELECTRICAL & GENERAL PROPERTIES					
Volts	Supplier to provide information.				
Phase	Supplier to provide information.				
Hz	Supplier to provide information.				
MECHANICAL PROPERTIES					
Type of seal	Mechanical ☒	Magnetic ☐	Stuffing box ☐	Dry run protection ☐	
Impellor material	Supplier to provide information.				
Pump Casing material	Supplier to provide information.				
Type of seal	Supplier to provide information.				
Shaft material	Supplier to provide information.				
PIPE NOZZLE					
Pipe Suction	Size	40 mm	Rating	150#	Flange Spec. SS,ASTM A182-F304/304L,ASME B16.5, RF
Pipe Discharge	Size	40 mm	Rating	150#	Flange Spec. SS,ASTM A182-F304/304L,ASME B16.5, RF
POWER					
Absorbed Power	Supplier to provide information.				
Installed Power	Supplier to provide information.				
Noise Criteria	Maximum Allowable sound level at 1m distance not to exceed 85 dBA.				

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ENGINEERING SERVICES DEPARTMENT		 necsa Nuclear Energy Corporation of South Africa	
Specification Sheet for KOH Circulation Pump P83164			
Project	PTFE Filter Destruction Project	Unit Tag Number	P83164
Datasheet Document No.	ENS-FDP-SPE-24021	Revision	1
VENDOR DATA REQUIRED WITH TENDER			
1. Pump performance curve 2. Pump duty 3. Pump efficiency 4. Pump rotational speed 5. Pump dimensions with baseplate			
REFERENCE DRAWINGS AND DOCUMENTS			
[1] ENS-FDP-PID-24003: Filter Destruction Project P&I Diagram – KOH Scrubber System 831.			
[2] ENS-FDP-REP-24034: Centrifugal Pumps Sizing Report for FDP Demonstration Facility.			
[3] ENS-FDP-CLC-24024: Centrifugal Pumps Sizing Calculations for FDP Demonstration Facility.			
NOTES AND ABBREVIATIONS			
[a] KOH - Potassium Hydroxide			
[b] SC - Safety Class			
[c] QC - Quality Class			
[d] wt. % - Mass Fraction Percentage			
[e] Supplier to advise on special requirements for installation of pump.			
Function	Name	Signature & Date	
Prepared	L Dlamini (Process Engineer)	 Signed by: L Dlamini (Process Engineer) Date: 2024/08/27	
Checked	MB Msane (Mechanical Engineer)	 Signed by: MB Msane (Mechanical Engineer) Date: 2024/08/27	
Checked	B Khumalo (Senior Process Engineer)	 Signed by: B Khumalo (Senior Process Engineer) Date: 2024/08/27	
Checked	S Mngoma (Chief Mechanical Engineer)	 Signed by: S Mngoma (Chief Mechanical Engineer) Date: 2024/08/27	
	G Manuel (Chief C&I Engineer)	 Signed by: G Manuel (Chief C&I Engineer) Date: 2024/08/27	
Checked	W van den Berg (Chief Electrical Engineer)	 Signed by: W van den Berg (Chief Electrical Engineer) Date: 2024/08/27	
Approved	K Moodley (Chief Process Engineer)	 Signed by: K Moodley (Chief Process Engineer) Date: 2024/08/27	
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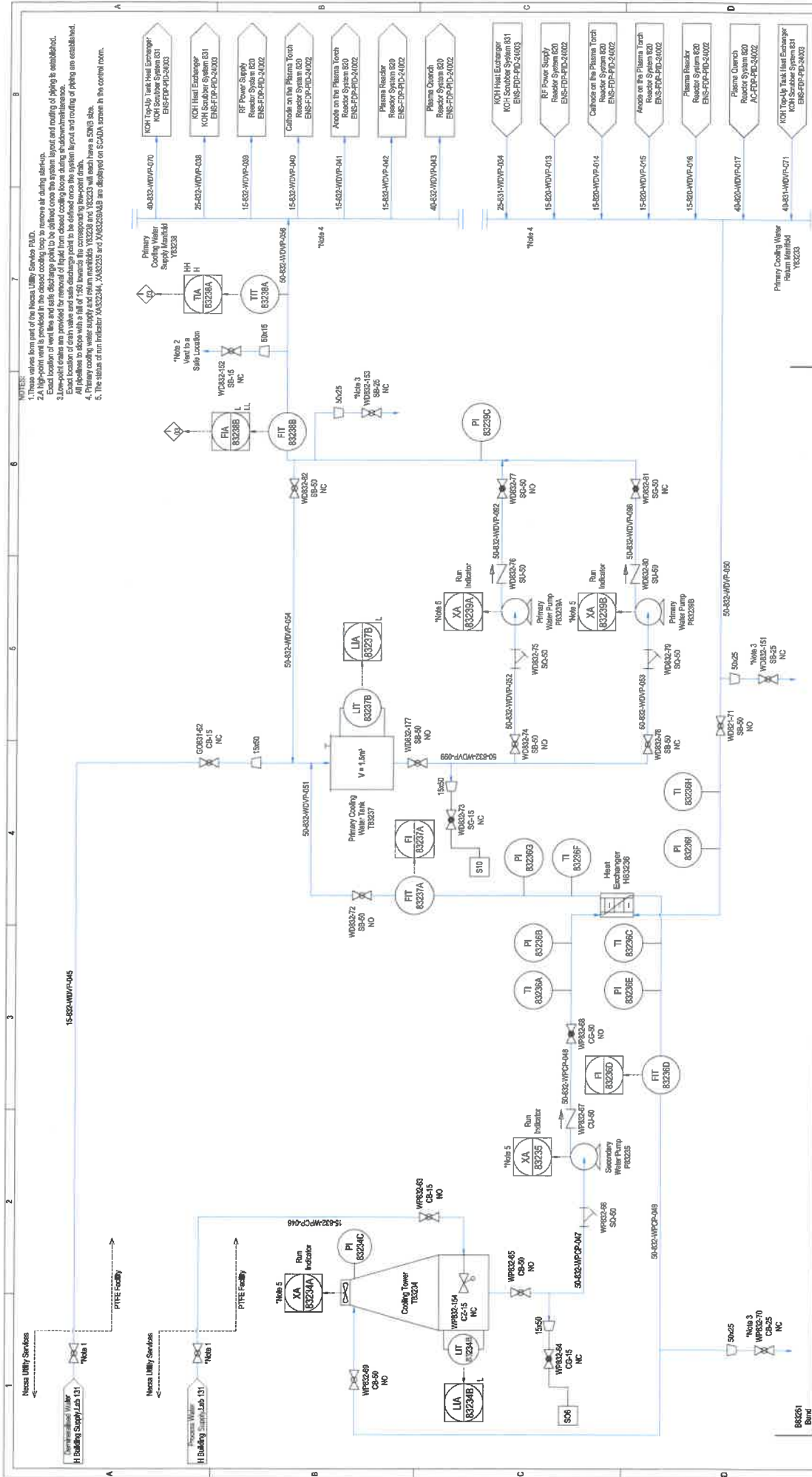


REVISIONS										PROJECT										TITLE										SCALE										SHEET										UNITS										TENSURE																																																																					
REV										DESCRIPTION										DATE										BY										CHKD										APPD										SCALE										UNIT										SHEET										NO.										OF										TOTAL										REVISION									
1										Initial Design										2020-01-15										J. Doe										M. Smith										K. Brown										1:1										mm										1										1										1										1																			
2										Revised Design										2020-02-10										J. Doe										M. Smith										K. Brown										1:1										mm										1										1										1										2																			
3										Final Design										2020-03-05										J. Doe										M. Smith										K. Brown										1:1										mm										1										1										1										3																			

FUNCTION										NAME										DESIGNATION										SIGNATURE									
PROCESS ENGINEER										M. Smith										Process Engineer																			
SAFETY ENGINEER										K. Brown										Safety Engineer																			
MECHANICAL ENGINEER										G. Brown										Chief Mechanical Engineer																			
ELECTRICAL ENGINEER										W. van den Berg										Chief Electrical Engineer																			
INSTRUMENTATION ENGINEER										K. Moolenaar										Chief Instrumentation Engineer																			

NOTES:

1. The design is based on the data provided in the process flow diagram and the P&ID.
2. The design is based on the data provided in the process flow diagram and the P&ID.
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15. The design is based on the data provided in the process flow diagram and the P&ID.



REFERENCED P&IDs & DOCUMENTS

FUNC.	NAME	DESIGNATION	SIGNATURE
PRPD	N.Mokone	Process Engineer	
CHKD	M.Mesiyaya	Process Engineer	
CHKD	M.Correia	Senior Process Engineer	
CHKD	S.Mingoma	Chief Mechanical Engineer	
CHKD	G.Manuel	Chief Engineer Control & Instrumentation	
CHKD	W.van den Berg	Chief Electrical Engineer	
APPRD	K.Moodley	Chief Process Engineer	

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DESCRIPTION

PRPD

DATE

PROJECT	PTFE FILTER DESTRUCTION PROJECT
TITLE	P&ID DIAGRAM
DRG. No.	COOLING WATER SYSTEM 832
SHEET	1 OF 1
TEAM/CENTRE No.	ENS-FDP-PID-24004

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