	Specification	Peaking
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Title: **Technical Specification for the Hydrostatic Pressure Testing of Pyroshield Gas Cylinders, Damper Pilot Cylinders, Gas Pilot Cylinders and Renewal of Flexible Hoses on the Pyroshield Gas Cylinders, Damper Pilot Cylinders and Gas Pilot Cylinders at Port Rex Power Station**

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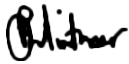
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Compiled by



B Lintnaar

Senior Technologist – Auxiliary and Ancillary

Date: **2021/08/03**

Functional Responsibility

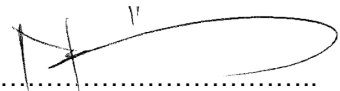


R. Marr

A&A System Engineering Manager – (Acting)

Date: **2021/08/04**

Authorised by

PP 

S. Maharaj

Engineering Manager - Peaking Business Operating Unit

Date: **2021-08-04**

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CONTROLLED DISCLOSURE

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1. INTRODUCTION

Port Rex Power Station will be undergoing the hydrostatic pressure testing of the Pyroshield Gaseous Suppression System Cylinders as well as the renewal of the flexible hoses on the cylinders to ensure compliance to fire safety legislation and to maintain integrity of the fire protection systems.

Port Rex has three units and each unit comprise of two engine enclosures. Each engine enclosure is equipped with a Pyroshield Total Flooding Gaseous Fire Suppression System that consists of 4 x 80 Litre 200 bar Pyroshield Gas Cylinders, 1 x 3 Litre 140 bar Pyroshield Pilot Cylinder, 1 x 3 Litre 35 bar Damper Pilot Cylinder, 4 x Pyroshield Cylinder Discharge Hoses, 3 x Pyroshield Cylinder Interconnecting Hoses, 1 x Pyroshield Pilot Cylinder Discharge Hose and 1 x Damper Pilot Cylinder Discharge Hose.

This Technical Specification defines the requirements for the hydrostatic pressure testing of the Pyroshield Cylinders and the replacement of the flexible hoses on the cylinders.

2. SUPPORTING CLAUSES

2.1 SCOPE

The document covers the specifications required for the hydrostatic pressure testing of cylinders and replacement of hoses on the Pyroshield Gaseous Suppression System.

2.1.1 Purpose

The purpose of this Technical Specification is to state the *Employer's* technical requirements and provide the *Contractor* with the necessary information to submit a comprehensive tender.

2.1.2 Applicability

This document shall apply to Peaking, specifically Port Rex Power Station and is to be used as an input to the associated Works Information.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- | | | |
|-----|---------------|---|
| [1] | OHS Act | Occupational Health and Safety Act No. 85 of 1993 |
| [2] | PER | Pressure Equipment Regulations |
| [3] | ISO 9001 | Quality Management Systems |
| [4] | 240-105658000 | Supplier Contract Quality Requirements Specification |
| [5] | 240-54937450 | – Fire Protection and Life Safety Design Standard |
| [6] | 240-62196227 | Eskom Life-saving Rules Directive 23-421 |
| [7] | 32-136 | Contractor Health and Safety Requirements |
| [8] | 36-681 | Generation Plant Safety Regulations |
| [9] | SANS 14520 | Gaseous Fire Extinguishing Systems: Physical Properties and System Design |

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[10] SANS 10400-T The Application of the National Building Regulations Part T – Fire Protection

2.2.2 Informative

- [11] 18.49/U1/534 Unit 1 Engines A&B Pyroshield Gas Suppression Installation Layout
- [12] 18.49/U2/534 Unit 2 Engines A&B Pyroshield Gas Suppression Installation Layout
- [13] 18.49/U3/534 Unit 3 Engines A&B Pyroshield Gas Suppression Installation Layout
- [14] 18.49/U1/528 Unit 1 Engines Pyroshield 4 x 80 Ltr Cylinder Layouts
- [15] 18.49/U2/528 Unit 2 Engines Pyroshield 4 x 80 Ltr Cylinder Layouts
- [16] 18.49/U3/528 Unit 3 Engines Pyroshield 4 x 80 Ltr Cylinder Layouts

2.2.3 Disclosure Classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

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3. EXECUTIVE OVERVIEW

Port Rex Power Station will be undergoing the hydrostatic pressure testing of the Pyroshield Gaseous Suppression System Cylinders as well as the renewal of the flexible hoses on the cylinders to ensure compliance to fire safety legislation and to maintain integrity of the fire protection systems.

Port Rex is a 171MW open cycle gas turbine power station comprising three units rated at 57MW each. The station is located in a light industrial area close to East London, some 3km inland from the coast and alongside the 132kV Port Rex Substation.

The *works* make provision for the supply of labour, supply of tools and equipment for the removal of the gas & pilot cylinders from its position, loading of the cylinders, delivery of gas & pilot cylinders to off-site premises for inspection and pressure testing, conducting inspection of cylinders, hydrostatic pressure testing & recharging of cylinders, refill of four empty pyroshield gas cylinders, refill of two empty pilot cylinders, collecting of cylinders at off-site premises, delivery to power station, off-loading and installation of the gas cylinders & pilot cylinders and the renewal and installation of hoses on the gas cylinders and pilot cylinders at Port Rex Power Station.

The *works* are to be done as per the *Employer's* specifications as stipulated in this document.

3.1 DESCRIPTION OF THE WORKS

3.1.1 The *Contractor's* scope of supply

The scope of supply includes the following:

- a) Provide resources for the removal and installation of cylinders and hoses.
 - The removal and installation of the cylinders and supervision for the pressure testing is performed by a SAQCC Accredited service provider that is relevant to gaseous fire suppression systems.
 - Provide SAQCC Accreditation detail of the resources involved with the *works*.
 - Provide OEM training certificate.
- b) Provide a history record of previous work performed on gaseous fire suppression systems.
- c) Provide all necessary equipment, tools & material required to complete the *works*.
- d) Provide transport for transporting cylinders off-site and back to the power station.
- e) Provide inspection reports on the condition of the cylinders.
- f) Provide third party test certificates for the hydrostatic pressure tests.
- g) Provide new hoses of the same specifications and dimension to the existing hoses.
- h) Provide certification (material and pressure test certificates) for the new hoses.
- i) Provide a method statement and a detailed bar chart programme of removal, pressure testing and installation of cylinders.
- j) Provide a safety file prior to execution of the *works*.

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3.1.2 The *Contractor's* scope of work

The scope of work is as follows:

- a) Disconnect and remove cylinders and hoses from its position.
- b) Load cylinders and transport off-site for pressure testing.
- c) Off-load cylinders at *works* for inspection and hydrostatic pressure testing.
- d) Perform a complete visual inspection and record the condition of the cylinders. The results of the inspection are recorded and supplied in the form of a suitable inspection report.
- e) Perform hydrostatic pressure testing of all cylinders to the specifications.
- f) Submit third party pressure test certificates for all cylinders.
- g) All cylinders are recharged with the required medium to its respective working pressure following the pressure test.
- h) Empty (discharged) cylinders must be hydrostatically pressure tested before refill.
- i) All hoses are renewed in accordance with the dimensions and specifications to the original hoses.
- j) Material and pressure test certificates are supplied for all of the new hoses.
- k) Load cylinders at the *works* and transport to Port Rex.
- l) Deliver new hoses to Port Rex.
- m) Off-load cylinders and perform installation of cylinders and hoses.
- n) The inspection & hydrostatic pressure testing of the cylinders for a specific unit is completed and the equipment is re-installed before the *works* commence on the remaining units.

4. DRAWINGS

- a) This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this specification.
- b) No dimensional drawings for the hoses are supplied by the *Employer*; however the *Contractor* is responsible for ensuring that all dimensions are co-ordinated with the site requirements.

Drawing number	Revision	Title
18.49/U1/534	0	Unit 1 Engines A&B Pyroshield Gas Fire Suppression Installation Layout

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18.49/U2/534	0	Unit 2 Engines A&B Pyroshield Gas Fire Suppression Installation Layout
18.49/U3/534	0	Unit 3 Engines A&B Pyroshield Gas Fire Suppression Installation Layout
18.49/U1/528	0	Unit 1 Engines Pyroshield 4 x 80 Ltr Cylinder Layouts
18.49/U2/528	0	Unit 2 Engines Pyroshield 4 x 80 Ltr Cylinder Layouts
18.49/U3/528	0	Unit 3 Engines Pyroshield 4 x 80 Ltr Cylinder Layouts

5. SPECIFICATIONS

Title	Date or revision	Tick if publicly available
<u>General Specifications:</u>		
240-105658000 – Supplier Contract Quality Requirements Specification		
ISO 9001:2008 – Quality Management Systems		
OHASA (1993) – Occupational Health and Safety Act of South Africa, Act 85 of 1993		√
32-136 – Contractor Health and Safety Requirements		
36-681 – Generation Plant Safety Regulations		
240-62196227 – Eskom Life-saving Rules Directive 23-421		
<u>Technical specifications:</u>		
SANS 14520 – Gaseous Fire Extinguishing Systems: Physical Properties and System Design		√

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SANS 10400-T – The Application of the National Building Regulations Part T – Fire Protection		√
240-54937450 – Fire Protection & Life Safety Design Standard		

6. CONSTRAINTS ON HOW THE *CONTRACTOR* PROVIDES THE *WORKS*

6.1 General Requirements

- Skills and experience of the *Contractor's* personnel for the *Works* is provided for evaluation of competency for work on gaseous fire suppression systems.
- A history record of previous work performed on gaseous fire suppression systems is supplied for evaluation.
- Supplier to demonstrate that personnel involved in the *Works* have received training from the OEM and that a training certificate is provided.

6.2 Technical Requirements

6.2.1 Installation Arrangement

- Port Rex has three units and each unit comprise of two engine enclosures.
- Each engine enclosure is equipped with a Pyroshield Total Flooding Gaseous Fire Suppression System that consists of the following relevant equipment:
 - 80 Litre 200 bar Pyroshield Gas Cylinders (4 off)
 - 3 Litre 140 bar Pyroshield Pilot Cylinder (1 off)
 - 3 Litre 35 bar Damper Pilot Cylinder (1 off)
 - Pyroshield Cylinder Discharge Hose (4 off)
 - Pyroshield Cylinder Interconnecting Hose (3 off)
 - Pyroshield Pilot Cylinder Discharge Hose (1 off)
 - Damper Pilot Cylinder Discharge Hose (1 off)
- The total number of equipment installed across all 3 units are as follows:
 - 80 Litre 200 bar Pyroshield Gas Cylinders (24 off)
 - 3 Litre 140 bar Pyroshield Pilot Cylinder (6 off)
 - 3 Litre 35 bar Damper Pilot Cylinder (6 off)
 - Pyroshield Cylinder Discharge Hose (24 off)
 - Pyroshield Cylinder Interconnecting Hose (18 off)
 - Pyroshield Pilot Cylinder Discharge Hose (6 off)
 - Damper Pilot Cylinder Discharge Hose (6 off)

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- The removal, pressure testing and installation of cylinders are performed on one unit at a time, meaning that the *works* for a specific unit is completed before the *works* are repeated on the next unit.

6.2.2 Pyroshield Cylinders

- The required Pyroshield demand is stored in high pressure cylinders. Each cylinder has a volume of 80 litres and is charged at 200 bar.
- The dimensions and filling details of the Pyroshield Cylinders are as follows:

Container Size (Litres)	Diameter (mm)	Overall Height (mm)	Empty Weight (kg)	Pyroshield Quantity (m ³)	Pyroshield Quantity (kg)	Total Weight (kg)
80	267	1885	99	16.205	22.89	123

- Pyroshield Cylinders are hydrostatically pressure tested to 400 bar.

6.2.3 Pyroshield Pilot Cylinders

- The Pyroshield Pilot Cylinder comprises a 3 litre pilot cylinder charged with Nitrogen to a fill pressure of 140 bar.
- Pyroshield Pilot Cylinders are hydrostatically pressure tested to 280 bar.

6.2.4 Damper Pilot Cylinders

- The Damper Pilot Cylinder comprises a 3 litre pilot cylinder charged with Nitrogen to a fill pressure of 35 bar.
- Damper Pilot Cylinders are hydrostatically pressure tested to 70 bar.

6.2.5 Pyroshield Cylinder Discharge Hose

- The discharge hose connects the cylinder valve outlet on the pyroshield cylinder (200 bar) to the check valve on the manifold.
- Hoses are renewed in accordance with the specifications of the sample as determined on site and the following additional information:
 - Insert: MF 2000 Multifit Type
 - Tube: Oil resistant synthetic rubber
 - Reinforcement: Two high tensile steel braids
 - Cover: Environment resistant synthetic rubber
 - Type Approvals: Bureau Veritas (Type Approval Number: 21041/07214/A2/PRSO BV)
 - Temperature: -40°C - +100°C, Peaks 125°C

- Dimensions of the discharge hose are as follows:

Hose Size			Reinforcement Outer Diameter		Outer Diameter		Max. Working Pressure		Burst Pressure		Min. Bend Radius	
DN	mm	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch
12	12.7	½'	19.8	0.781	21.8	0.86	275	3980	1100	15950	178	7.01

- Pyroshield Cylinder Discharge Hoses are pressure tested to **400 bar** and certification is supplied.

6.2.6 Pyroshield Cylinder Interconnecting Hose

- Pyroshield interconnecting hoses connects the pyroshield cylinder valves to each other.
- Hoses are renewed in accordance with the specifications of the sample as determined on site and the following additional information:
 - Insert: MF 2000 Multifit Type
 - Tube: Oil resistant synthetic rubber
 - Reinforcement: Two high tensile steel braids
 - Cover: Environment resistant synthetic rubber
 - Type Approvals: Bureau Veritas (Type Approval Number: 21041/07214/A2/PRSO BV)
 - Temperature: -40°C - +100°C, Peaks 125°C

- Dimensions of the interconnecting hose are as follows:

Hose Size			Reinforcement Outer Diameter		Outer Diameter		Max. Working Pressure		Burst Pressure		Min. Bend Radius	
DN	mm	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch
6	6.4	¼'	12.7	0.5	14.7	0.58	400	5800	1600	23200	100	3.94

- Interconnecting hoses are pressure tested to **400 bar** and certification is supplied.

6.2.7 Pyroshield Pilot Cylinder Discharge Hose

- The pilot actuation hose for the gas release connects the pilot cylinder valve and the nearest pyroshield cylinder valve.
- Hoses are renewed in accordance with the specifications of the sample as determined on site and the following additional information:
 - Insert: MF 2000 Multifit Type
 - Tube: Oil resistant synthetic rubber
 - Reinforcement: Two high tensile steel braids
 - Cover: Environment resistant synthetic rubber
 - Type Approvals: Bureau Veritas (Type Approval Number: 21041/07214/A2/PRSO BV)
 - Temperature: -40°C - +100°C, Peaks 125°C

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- Dimensions of the pilot cylinder hose are as follows:

Hose Size			Reinforcement Outer Diameter		Outer Diameter		Max. Working Pressure		Burst Pressure		Min. Bend Radius	
DN	mm	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch
10	9.5	3/8'	16.7	0.66	18.7	0.74	330	4780	1320	19140	127	5.00

- Pilot Hoses are pressure tested to **330 bar** and certification is supplied.

6.2.8 Damper Pilot Cylinder Discharge Hose

- The pilot actuation hose for the damper release connects the pilot cylinder valve and the damper line check valves.
- Hoses are renewed in accordance with the specifications of the sample as determined on site and the following additional information:
 - Insert: MF 2000 Multifit Type
 - Tube: Oil resistant synthetic rubber
 - Reinforcement: Two high tensile steel braids
 - Cover: Environment resistant synthetic rubber
 - Type Approvals: Bureau Veritas (Type Approval Number: 21041/07214/A2/PRSO BV)
 - Temperature: -40°C - +100°C, Peaks 125°C

- Dimensions of the pilot cylinder hose are as follows:

Hose Size			Reinforcement Outer Diameter		Outer Diameter		Max. Working Pressure		Burst Pressure		Min. Bend Radius	
DN	mm	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch
10	9.5	3/8'	16.7	0.66	18.7	0.74	330	4780	1320	19140	127	5.00

- Pilot hoses are pressure tested to **330 bar** and certification is supplied.

6.3 TESTS AND INSPECTIONS BEFORE DELIVERY

6.3.1 Inspections

The *Contractor* conducts a visual inspection on the cylinders that comprise, but is not limited to the following:

- Check for corrosion indications (pitting, lamination, etc.)
- Check for cylinder bulging
- Check for cylinder distortion
- Check cylinder body internally

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-
- Check cylinder valve assembly

The *Contractor* supplies inspection reports.

6.3.2 Hydrostatic Pressure Testing

The *Contractor* performs hydrostatic pressure testing of the cylinders and certification is carried out by a third party.

The *Contractor* supplies all test certificates.

6.4 Facilities to be provided by the Contractor

6.4.1 Resources

- a) The *Contractor* provides the necessary personnel resources to complete the *Works*.
- b) Skills and experience of the *Contractor's* personnel for the *Works* must be provided for technical evaluation.

6.4.2 Tools and Equipment

The *Contractor* supplies all tools and equipment for the *Works*.

6.4.3 Storage

The *Contractor* to ensure that adequate provision has been made for all storage requirements.

6.5 Title to material from excavation and demolition

The *Contractor* has no title to plant and/or materials resulting from him carrying out the *Works*.

6.6 Design by the Contractor

The *Contractor* clarifies all requirements for the *works* at Port Rex Power Station during a site meeting day conducted by the *Employer*.

6.7 Packaging, Crating, Freight, Delivery & Offloading

The *Contractor* adequately packages, delivers and offloads all materials required for the *Works* at Port Rex Power Station.

6.8 Clean Working Conditions

The site is kept and left in a clean and orderly condition as the work progresses and upon completion thereof.

7. DOCUMENTATION

All documentation and drawings standards to comply with the latest Eskom's Engineering Drawing Standard – Common Requirements, 240-86973501 rev1; 240-54179170: Classification and designation of technical documentation and Documentation Management Standard, 32-644 rev1 and respectively.

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The documentation and drawings supplied is in South African English and SI units are used.

The Employer does not accept scanned electronic copies of documentation or drawings; however the original documentation with signature is scanned for electronic purposes.

The documentation is submitted in loose leaf binders to ISO format and normally A4 size. The use of oversize pages is kept to a minimum and does not exceed page height of an A4 unfolded. Fixings are "D" ring and are of the snap close type. Post binders or other fixings are not acceptable. Binders do not exceed 80 mm in overall thickness. The document identity appears on both the front cover and on the spine.

Documentation are of good quality, prepared by suitably qualified personnel and contain the general arrangement drawings, installation drawings and instructions, operating and maintenance instructions for all components.

Detailed parts lists are accompanied by exploded view type drawings clearly detailing the part, technical descriptions of the plant and material and component parts, spare part ordering instructions and type test certificates.

8. COMPLETION

The *Contractors* completion job cards can be signed only after:

- Installation and issuing of test certificates is completed according to specified scope for the *Works*,
- all defects are repaired
- all *Employer's* and *Contractor's* check sheets and QCP (Quality Control Plan) documents are signed in accordance with QM-58

9. QUALITY MANAGEMENT (QM)

- a) The quality requirements are as per ISO 9001:2008 and as per Eskom document 240-105658000, SUPPLIER CONTRACT QUALITY REQUIREMENTS SPECIFICATION.
- b) The programming of inspections, hold and witness points is agreed between the *Employer* and the *Contractor* prior to undertaking any work.
- c) The *Contractor* defines the level of QA/QC or inspection imposed on his Sub-*Contractors* and suppliers.
- d) All technical design and implementation documentation and PQP are submitted to the *Employer* for Acceptance prior to the *Works*.
- e) The *Contractor* is made aware that all documents or designs submitted for review to the *Employer* for Acceptance, requires a process of review.
- f) The *Contractor* prepares and submits installation procedures with quality check sheets as well as the Quality Control Plan. Quality acceptance criteria must be included in these procedures.
- g) The *Contractor* documents all inspections as part of the quality assurance and control procedures. These documents are handed to the *Employer* as records.

9.1. Technical tender returnable documents

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-
- a) Tenderer submits the completed/filled-in Schedule A&B together with the Deviation Schedule (Annexure A) as listed under Appendix A.
 - b) Tenderer submits the required tender returnable documents as required by the Mandatory and Qualitative Requirements under Appendix B.
 - c) Tender submits the completed pricing schedule as listed under Appendix D.

9.2. Safety and Quality Engineering (QE) tender returnable documents

- a) Safety file (the tenderer has made provision to conform with the requirements of the SHE file)
- b) Quality Control Documents (this shall include but not limited to samples of procedures, inspection check sheets, Test Certificates, etc.)
- c) Manufacturer's data sheets of all materials offered.

10. SAFETY MANAGEMENT

The *Contractor* takes every precaution to ensure safety and to protect the *Works* and temporary *Works*. The *Contractor* is responsible for the safety and security of his personnel, materials on Site and the *Works* at all times. The *Contractor* adheres to the safety regulations pertaining to the power station and Sub-*Contractors*.

The *Contractor* provides all the required safety and personal protective Equipment to his staff for the duration of the contract. Safety barriers and access scaffolding is deemed as Equipment and is the responsibility of the *Contractor*.

The *Contractor* complies with the requirements of the Construction Regulation, 2014. R1010 of the Act and forwards proof of Notification of Construction Works to the Department of Labour as required in the Construction Regulations.

The *Contractor* and his personnel attend an induction meeting on Site and sign the attendance sheet provided as proof of attendance.

Without prejudice to any other requirements of this *Works* Information or the Conditions of Contract, the *Contractor* must comply with the following:

- a) Eskom Plant Safety Regulations GGR 0992
 - b) Eskom Operating Regulations for High Voltage Systems, ESKARAAG4
 - c) The Occupational Health and Safety Act No. 85 of 1993 and Regulations
 - d) The Compensation for Occupational Injuries and Diseases Act No.130 of 1993, amended by government notices to 30 April 2004 or Equivalent
 - e) Eskom Life-saving Rules
- The Eskom Life-saving Rules complement our existing safety best practices and address safety procedures are followed at all locations. Five Life-saving rules developed apply to all Eskom employees, agents, consultants, and *Contractors*.
- Life-saving rules are safety rules that describe such extreme behaviour that all reasonable employees agree that anyone knowingly and wilfully violating one of them are putting his/her life and

any other lives in jeopardy and are dealt with seriously. The Life-saving rules are: Standard 240-62196227.

11. ENVIRONMENTAL MANAGEMENT

The *Contractor* acquaints himself with all statutory and local environment regulations and adheres to these without exception.

The *Contractor* complies with the Hazardous Chemical Regulations, GNR. 1179 of 25 August 1995 as amended by GNR.930 of 25 June 2003 and GNR.683 of June 2008 when using any hazardous chemicals, as well as complying with the requirements of the National Environmental Management Act of 1988.

12. SPECIFICATIONS

The specifications/standards that apply to this Technical Specifications are listed here.

Item	Specification / Standard	Description
1.	<u>OHASA (1993)</u>	Occupational Health And Safety Act Of South Africa, Act 85 Of 1993
2.	PER	Pressure Equipment Regulations
3.	ISO 9001	Quality Management Systems
4.	36-681	Eskom Plant Safety Regulations
5.	240-105658000	Supplier Contract Quality Requirements Specification
6.	240-54937450	Fire Protection and Life Safety Design Standard
7.	240-62196227	Eskom Life-saving Rules Directive 23-421
8.	32-136	Contractor Health and Safety Requirements
9.	SANS 14520	Gaseous Fire Extinguishing Systems: Physical Properties and System Design
10.	SANS 10400-T	The Application of the National Building Regulations Part T – Fire Protection

The revisions and amendments of the Specification documents that apply are the latest revisions and amendments in force at the time of the Contract authorisation.

Nothing in the Specification documents lessens the *Contractor's* obligations as detailed in any other documents forming part of the Contract.

13. REQUIREMENTS FOR THE PROGRAMME

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The *Contractor* submits a bar (Gantt) chart program in MS Project format, detailing how the *Works* is executed within the stipulated dates, including rest days, weekends and public holidays.

The programme indicates the following phases:

- a) Procurement of materials guaranteed start date
- b) Submission of execution documentation for review and acceptance
- c) Guaranteed date for delivery of materials to Port Rex Power Station
- d) Site Inductions
- e) Site establishment and preparations
- f) Installation
- g) Inspections
- h) Signing off the *Works*

The programme indicates links between activities

14. SERVICES AND OTHER THINGS PROVIDED BY THE EMPLOYER

14.1. Site Acceptance

The *Contractor* witnesses inspections performed by the *Employer* and any deviations are addressed by the *Contractor*.

14.2. Plant Isolation

The *Employer* isolates the plant ensuring that it is safe for the *Contractor* to perform the *Works* and issue permits to work. The *Employer* and *Contractor* perform a risk analysis before work commence on daily basis. The *Contractor* together with the *Employer* completes the workers register before and after each working day as stipulated in the *Employer's* Plant Safety Regulations.

14.3. Clean Working Conditions

The *Employer* is responsible for Clean Working Conditions, for the duration of the work, and uses the *Employer's* Standard Reference no 167A-139, as a minimum requirement.

The *Employer* is responsible to establish and maintain a protected environment around the work area. Only persons authorized by the *Employer* have access to the work area. Precautions are enforced by the *Contractor* to ensure that no foreign objects are left inside the machines at any stage of the work.

The *Employer* stores plant components, other materials and equipment for which he is responsible in an orderly manner.

The *Employer* ensures that the working area remains clean for the duration of the installation.

14.4. Decommissioning

Not Applicable.

14.5. Site Clearance

The *Employer* performs site clearance inspection after the *Works* has been completed.

The *Contractor* removes all his equipment and put all scrap materials into the scrap bins provided by the *Employer*.

14.6. Ablution Facilities

The *Employer* indicates which ablution facilities may be used.

14.7. Messing Facilities

The *Employer* indicates which messing facilities may be used.

14.8. Office space

No office is provided.

Charges for telephone calls and faxes are for the *Contractor's* account.

14.9. Parking space

Parking space is available outside of the Power Station building

14.10. Storage

The *Contractor* indicates storage requirements.

C4: Site Information

Port Rex is a 171MW open cycle gas turbine power station comprising three units rated at 57MW each. The station is located in a light industrial area close to East London, some 3km inland from the coast and alongside the 132kV Port Rex Substation.

15. C4.1: INFORMATION ABOUT THE *SITE* AT TIME OF TENDER WHICH MAY AFFECT THE WORK IN THIS SPECIFICATION

15. 1. ACCESS LIMITATIONS

All Site access is controlled through the designated access gate.

The *Contractor* is informed of the access procedures through Site regulations and that such procedures may change depending on the prevailing security situation.

The *Contractor* is to comply with all Site regulations and instructions. The onus is on the *Contractor* to ensure his familiarity with the *Employer's* Site regulations and inspections.

Before work starts on Site, a Site inaugural meeting is held between the *Contractor* and the *Employer*, where details of the *works* are discussed and clarified.

General access to the power station is controlled and Site induction has to be completed before work will be allowed to start.

It is mandatory that the *Contractor* adheres to all security regulations in force during the period of the contract.

Before entry to the Site will be allowed, everyone will undergo an alcohol breathalyser test which needs to be passed. This is one of the five Life-saving Rules to which the *Contractor* is required to adhere to at all times.

15. 2. GROUND CONDITIONS IN AREAS AFFECTED BY WORK IN THIS CONTRACT

None

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15. 3. HIDDEN AND OTHER SERVICES WITHIN THE *SITE*

None

15. 4. DETAILS OF EXISTING BUILDINGS / FACILITIES WHICH *CONTRACTOR* IS REQUIRED TO WORK ON

As viewed at the Site Meeting.

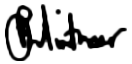

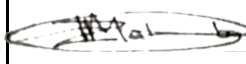
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16. ACCEPTANCE

This document has been seen and accepted by:

Name & Surname	Designation	Signature	Date
B. Lintnaar	Senior Technologist , A&A Mechanical		2021/08/03
M. Saulse	Senior Technician, A&A Mechanical		2021-08-03
Z. Mahamba	O&M Manager, Acacia & Port Rex		2021/08/03

17. REVISIONS

Date	Rev.	Compiler	Remarks
June 2021	0	B. Lintnaar	New document
June 2021	1	B. Lintnaar	Document distributed for authorisation

18. DEVELOPMENT TEAM

The following people were involved in the development of this document:

Not applicable.

19. ACKNOWLEDGEMENTS

Not applicable.

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APPENDIX A: SCHEDULE A/B

TECHNICAL REQUIREMENTS

1.1 GENERAL

The technical requirements of this section specified under 'Schedules A and B' shall form part of the *Employer's* enquiry documentation. Schedule B shall be completed by the *Contractor* and submitted with his tender.

1.2 SCHEDULES A AND B

Schedule A: Particular of *Employer's* Requirements

Schedule B: Guaranteed technical particulars of equipment offered in response to Schedule A requirements by the *Contractor*.

1.3 FILLING IN INSTRUCTIONS

- 1.3.1 Where the *Contractor* does not fully comply with the *Employer's* requirement, any deviations must be clearly indicated in Schedule B and listed in the Deviation Schedule (Annexure A).
- 1.3.2 Where there is a need to substantiate or further describe an item in Schedule B, especially in instances of non-compliance with Schedule A, particulars are furnished on a separate sheet clearly marked with the notation of the Schedule A item referred to.
- 1.3.3 If a blank space is left in Schedule B next to certain requirement specified in Schedule A, this constitutes a confirmation that the tender does not comply with that specific requirement.
- 1.3.4 Where *** is indicated for an item in Schedule A, the Contractor is required to fill in the appropriate information in Schedule B, for the equipment offered.
- 1.3.5 Where --- is indicated for an Item on Schedule B, no information is required from the Contractor

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Schedule A: Particulars of Eskom's requirements

Schedule B: Guarantees and technical particulars of equipment offered

2	REQUIREMENTS	100.00%		
2.1	New Flexible Hoses	35.00%	Schedule A	Schedule B
2.1.1	Dimensions and specifications are in line with the scope requirements and site dimensions.	50.00%	Yes	
2.1.2	Material, Dimensional and Test Certificates are supplied for the new hoses.	50.00%	Yes	
2.2	Inspection and Testing	35.00%	Schedule A	Schedule B
2.2.1	All cylinders are subjected to internal and external visual inspection for corrosion (pitting, lamination), bulging, distortion, etc.	25.00%	Yes	
2.2.2	Inspection reports are provided for all cylinders.	25.00%	Yes	
2.2.3	All cylinders are subjected to hydrostatic pressure testing	25.00%	Yes	
2.2.4	Certification is supplied for the pressure testing by a third party.	25.00%	Yes	
2.3	Dispatch, Delivery and Offloading	15.00%	Schedule A	Schedule B
2.3.1	Tenderer to ensure equipment is adequately protected during transportation from and to site.	50.00%	Yes	
2.3.2	Tenderer to inspect equipment for any damages prior to installation.	50.00%	Yes	
2.4	Installation	15.00%	Schedule A	Schedule B
2.4.1	Tenderer supplies a complete method statement for acceptance by <i>Employer</i>	25.00%	Yes	
2.4.2	Tenderer supplies a complete quality control plan for acceptance by <i>Employer</i>	25.00%	Yes	
2.4.3	Tenderer supplies a bar chart program for acceptance by <i>Employer</i>	25.00%	Yes	
2.4.4	Tenderer supplies a Safety File for acceptance by <i>Employer</i>	25.00%	Yes	

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ANNEXURE A: DEVIATION SCHEDULE

Any deviations/modifications/alternatives offered shall be listed below with reasons for the departures.

No deviations/modifications/alternative offered will be recognized unless listed on this schedule

If no deviations/modifications/alternatives are offered, this schedule must be marked **"None"**

Page Ref.	Specification / Schedule / or clause number	Proposed deviation/ modification/ alternative	Cost of deviation or alternative

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APPENDIX B: EVALUATION CRITERIA

MANDATORY TECHNICAL EVALUATION CRITERIA

Mandatory Technical Evaluation Criteria		Tender Returnable	Motivation for use of Criteria	Meet (YES / NO)
1	Tenderer submits proof of South African Qualifications Certification Committee (SAQCC) accreditation relevant to the works (for maintenance, design, install, test or commission of gaseous fire suppression systems) and an Organogram with names and accreditation detail of the personnel involved in the works. In case the Tenderer intends to subcontract, an Organogram with names and accreditation detail of the subcontractor personnel is provided. A letter of intent is provided where the services of a subcontractor will be used.	Copies as proof of accreditation and registration with SAQCC.	Legal requirement	
		Organogram with names and accreditation detail of the contractor and subcontractor personnel involved with the works. Letter of Intent is provided in case of subcontracting.		
2	Supplier to demonstrate that personnel involved in the <i>Works</i> have received training from the OEM and that a training certificate is provided.	OEM training certificate is provided for the personnel involved in the <i>works</i> .		

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QUALITATIVE TECHNICAL EVALUATION CRITERIA

INTEREST CATEGORIES	TENDER RETURNABLE	SCORING CRITERIA	WEIGHT	RATING (0-5)
EXPERIENCE			25.00%	
Tenderer submits evidence of completed works that are equivalent to the works required in this Specification. Tenderer produces a track record of completed works consisting as a minimum either of maintenance, design, installation, testing or commissioning of gaseous fire protection systems. In case the Tenderer intends to subcontract or form a joint venture, a letter of agreement, together with a track record must be produced.	Tenderer submit project references. As a minimum the reference list must contain: o Contact Person(s) o Contact Number(s) o Project Description o Construction Period o Contract Value	5 Projects - 5 3-4 Projects - 4 1-2 Projects - 2 0 Projects - 0	70.00%	
Years of experience in fire engineering.	Tenderer submits the company established date and detail of experience.	5 Years - 5 3-4 Years - 4 1-2 Years - 2 0 Years - 0	30.00%	
TECHNICAL SCHEDULE A&B COMPLIANCE			50.00%	
Compliance to scope of work, intent to undertake full scope of work.	Completion of the Technical Schedule A&B.	Schedule A&B score: 80%-100% [5] Schedule A&B score: 70%-79% [4] Schedule A&B score: 40%-69% [2] Schedule A&B score: 0%-39% [0]	100.00%	
OTHER REQUIREMENTS			25.00%	
The execution plan to include the following: 1. Basic project program showing duration of each activity 2. Method Statement 3. Quality Control Plans	Tenderer supplies approved execution documentation.	All 3 items supplied - 5 Number of items supplied: (equal to 2) - 4 Number of items supplied: (equal to 1) - 2 Number of items supplied: (no items supplied) - 0	100.00%	

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APPENDIX C: TECHNICAL EVALUATION STRATEGY

TECHNICAL EVALUATION THRESHOLD

Mandatory Technical Evaluation Criteria (gatekeepers) are 'must meet' criteria. These criteria shall not be weighted or point scored, but shall be assessed on a **Yes/No** basis as to whether or not the criteria are met. An assessment of 'No' against any criterion shall technically disqualify the tenderer and shall not be further evaluated against Qualitative Criteria.

Qualitative Technical Evaluation Criteria are weighted evaluation criteria used to identify the highest technically ranked tenderer after determining that all the Mandatory Evaluation Criteria have been met. The Qualitative Evaluation Criteria are weighted to reflect the relevant importance of each criterion. The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is 70%.

The scoring table is as follows:

Score	(%)
5	100
4	80
2	40
0	0

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APPENDIX D: PRICING DATA

C1 PRICING ASSUMPTIONS

Entries in the four columns Unit, Quantity, Rate and Price are made by the tendering *Contractor*.

All Prices are to be shown excluding VAT unless instructed otherwise by the *Employer* in Tender Data or in an instruction the *Employer* has given before the tenderer enters his Prices.

If there is insufficient space in the Price List which follows, state in which document the Price List is contained.

C2 PRICE LIST

The Price List is as follows / contained in _____ (delete the text which does not apply and this note)

1	Unit 1 Engines A&B Pyroshield Gaseous Systems				
Item no.	Description	Unit	Quantity	Rate	Price
1.1	Cost for removal of eight (8) Pyroshield Cylinders, four (4) Pilot Cylinders and twenty (20) hoses from its position.				
1.2	Cost for transporting eight (8) Pyroshield Cylinders and four (4) Pilot Cylinders to off-site <i>works</i> for hydrostatic pressure testing and return to Port Rex.				
1.3	Cost for installation of eight (8) Pyroshield Cylinders, four (4) Pilot Cylinders and twenty (20) hoses.				
1.4	Cost for hydrostatic pressure testing of (8) Pyroshield Cylinders and four (4) Pilot Cylinders.				
1.5	Cost for refill of four (4) empty Pyroshield Cylinders.				
1.6	Cost for renewal of twenty (20) hoses.				
1.7	Accommodation Cost				
1.8	Transport Cost				
	[1] The total of the Prices (excluding VAT):				

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2 Unit 2 Engines A&B Pyroshield Gaseous Systems					
Item no.	Description	Unit	Quantity	Rate	Price
2.1	Cost for removal of eight (8) Pyroshield Cylinders, four (4) Pilot Cylinders and twenty (20) hoses from its position.				
2.2	Cost for transporting eight (8) Pyroshield Cylinders and four (4) Pilot Cylinders to off-site <i>works</i> for hydrostatic pressure testing and return to Port Rex.				
2.3	Cost for installation of eight (8) Pyroshield Cylinders, four (4) Pilot Cylinders and twenty (20) hoses.				
2.4	Cost for hydrostatic pressure testing of (8) Pyroshield Cylinders and four (4) Pilot Cylinders.				
2.5	Cost for renewal of twenty (20) hoses.				
2.6	Accommodation Cost				
2.7	Transport Cost				
	[2] The total of the Prices (excluding VAT):				
3 Unit 3 Engines A&B Pyroshield Gaseous Systems					
Item no.	Description	Unit	Quantity	Rate	Price
3.1	Cost for removal of eight (8) Pyroshield Cylinders, four (4) Pilot Cylinders and twenty (20) hoses from its position.				
3.2	Cost for transporting eight (8) Pyroshield Cylinders and four (4) Pilot Cylinders to off-site <i>works</i> for hydrostatic pressure testing and				

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	return to Port Rex.				
3.3	Cost for installation of eight (8) Pyroshield Cylinders, four (4) Pilot Cylinders and twenty (20) hoses.				
3.4	Cost for hydrostatic pressure testing of (8) Pyroshield Cylinders and four (4) Pilot Cylinders.				
3.5	Cost for renewal of twenty (20) hoses.				
3.6	Accommodation Cost				
3.7	Transport Cost				
	[3] The total of the Prices (excluding VAT):				
4	Safety File				
Item no.	Description	Unit	Quantity	Rate	Price
4.1	Cost for Safety File				
	[1] + [2] + [3] + [4] The total of the Prices (excluding VAT):				

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