Eskom	Specification	Kusile Power Station

Title: **Kusile Power Station Supply and Deliver of Boiler Tubes**

Document Identifier:	**KUS-20240926**
Alternative Reference Number:	**N/A**
Area of Applicability:	**Kusile Power Station**
Functional Area:	**Material Management**
Revision:	**1**
Total Pages:	**16**
Next Review Date:	**November 2027**
Disclosure Classification:	**Controlled Disclosure**

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Date: 2024/11/08	**Date:** 13.11.2024	**Date:**	**Date:** 25.11.2024

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1. Introduction

Kusile Power Station Management has taken a decision to outsource Boiler pressure part tubing supply for outage related scope to a suitably qualified, experienced and well established Contractor. This document describes the detail of the applicable plant areas, scope of work, standards, quality, requirements, specifications, terms & conditions as well as the criteria to qualify for the tender.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to define the specified scope of work activity requirements for Kusile Power Station. The station is expected to perform at 92% UCF, 6% PCLF and 2% UCLF, and the availability of the specified boiler tubing material during outage activities and management strategy efforts must support this requirement. It is therefore imperative that the successful and suitably qualified Contractor aligns his/her organisation fully to these specified scope activities and processes laid down in this document.

2.1.2 Applicability

This document shall apply throughout Eskom Kusile Power Station Units that are commercially operational.

2.1.3 Effective Date

Document is effective upon authorization.

2.2 Normative/Informative References

2.2.1 Normative

[1] ISO 9001 Quality Management Systems

[2] OHSACT Occupational Health and Safety Act, 85 of 1993

2.2.2 Informative

Not Applicable

2.3 Definitions

Contractor: Service provider contracted for supplying specific service to Eskom, Kusile Power Station.

a) **Employer**: Eskom, Kusile Power Station

b) **Employer Representative**: Any person appointed in writing by Employer as the delegated Employer representative in terms of the provisions.

c) **Plant**: Any structure, machinery, apparatus, or equipment which does not fall within the scope of the operating regulations for high voltage systems, and excludes, mobile, portable lifting equipment, domestic circuits' appliances and tools.

2.4 Abbreviations

Abbreviation	Description
OEM	Original Equipment Manufacturer
PCLF	Planned Capability Loss Factor
QCP	Quality Control Plan
SOW	Scope of Work
UCF	Unit Capability Factor
UCLF	Unplanned Capability Loss Factor
SSC	Submerged Scrapper Conveyor
QA	Quality assurance
QC	Quality Control
NDT	Non Destructive Testing
PCM	Process Control Manual
OD	Outside Diameter
WT	Wall Thickness

2.5 Roles and Responsibilities

2.5.1 The Employer

The responsibilities of the Employer include the following:

a) Inform and issue the Contractor with the updated outage plan

b) Ensure the SOW is issued to the Contractor in time to allow planning for the Outage

c) Performance is measured by the Employer against those areas which contribute to the Employer's business and the Contractor shall be compensated accordingly as per the agreed contract clauses. (e.g., Reliability, Availability and Safety).

d) Areas of measurement include the Employer's key business indicators and will be redefined from time to time.

2.5.2 The Contractor

The responsibilities of the Contractor include the following:

a) Comply with the Employer's Environmental, Health and Safety standards, policies, and procedures.
b) The Contractor shall compile improvement programmes to enhance plant performance and achieve cost reductions and the Employer will approve such programmes.
c) The Contractor must ensure that all spares preservation requirements are adhered to as per Employers requirements and procedures. (Eskom Procedure: **240-87733094)**
d) The Employer may request the Contractor to ensure that an accurate description of spare parts is maintained in the Employer's stores and the Contractor informs the Employer as to any recommended changes.
e) The Contractor is to ensure that any service rendered does not interfere with the Employer's scheduled work and should align himself with the Employer's work control management process.
f) Should the Employer become aware of any changes to the activity schedule (programme of notifications), the Employer may issue the Contractor with a revised programme.
g) Contractor vehicles to comply with Eskom Vehicle Standards and Procedures.
    i. All additional personnel and scope of work to be clarified with the Employer prior to work being done.
    ii. Will be required to comply with the Employers process control manuals (PCM) that outlines the outage processes.
    iii. The company must be ISO 9001:2015 certified.

2.5.2.1 Re-Commissioning

N/A

2.5.3 Management and Reporting

a) The Contractor to be represented at any ad-hoc meetings that may arise in order to address any outage planning, execution, finalisation or safety related matters.
b) Liaison meetings shall be held with the Employer's Representative or his/her delegate on as and when required basis to discuss any technical details, or concerns.

2.5.3.1 Contractor's management, meetings, and key people

a) The Contractor must ensure that all personnel operating mobile equipment and vehicles are authorised, this includes but not limited to;
    i. Forklifts
    ii. Mobile Cranes
    iii. Cherry Pickers
    iv. Sky Jacks
    v. Vehicles

2.5.3.2 Communication and Correspondence

a) All correspondence includes but not limited to:
   i. Kusile Power Station
   ii. Employer's Contract number
   iii. Contract description
   iv. Correspondence subject matter
   v. Employer's name and contact details
   vi. Contractor contact details
   vii. Date
b) Where appropriate the correspondence includes the Employer's reference and is delivered as a single package or as per the agreed contract terms.
c) All communications from the Contractor are numbered sequentially with a prefix as advised by the Employer. The Employer responds in like manner. The prefix and numbering system are decided upon at the Inaugural meeting.

2.5.4 Quality and Documentation Control

a) During the tender process a quality criterion will be defined that the Contractor must comply to.
b) The Contractor shall ensure that any witness, hold, and inspection points are strictly adhered to.
c) The Contractor to ensure that all measuring and test equipment is calibrated at all times & proof thereof must be readily available.
d) All Quality References and Standards as stipulated in this document will be adhered to.
e) The Contractor to comply with the Employer's quality documentation management system and processes.
f) Contractor shall ensure retention of documents for all supplied items for no less than 5 years.

2.5.5 Project Implementation

N/A

2.5.6 Manpower Requirements

N/A

2.6 Process for Monitoring

Process will be agreed by both parties per Task Order and according to Outage process control manuals and the specific outage SOW.

2.7 Related/Supporting Documents

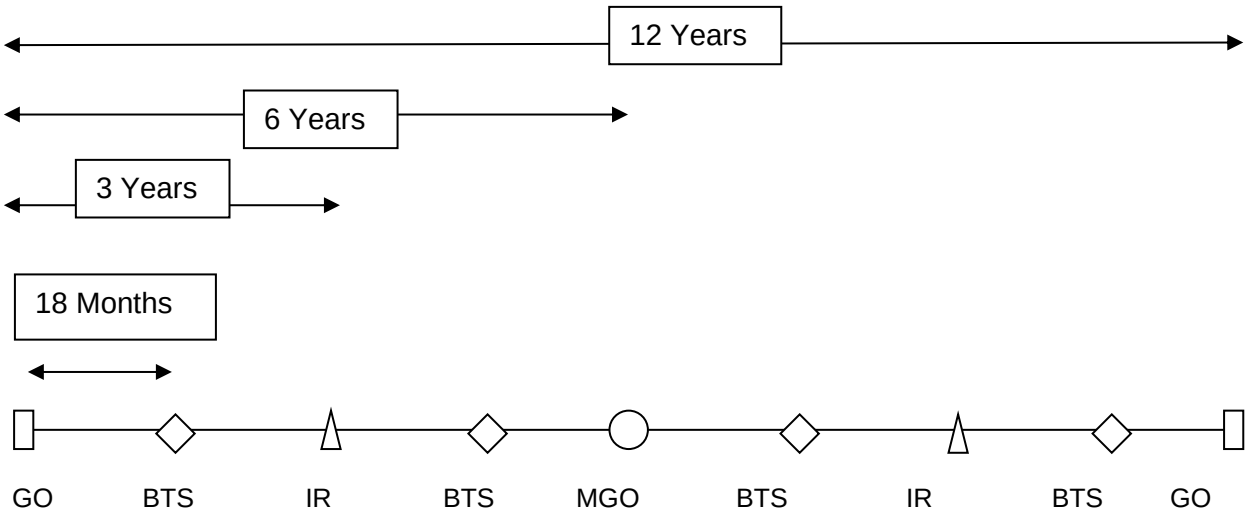
Boiler Spares strategy

3. Document Content

3.1 Works Information

3.1.1 Outage Philosophy

The scope of work is applicable to the Boiler pressure parts system as and when required as per scope of work. The system is also aligned to Kusile Power Station Outage Philosophy depicted as follows and gets reviewed yearly.



Symbol	Outage Type	Interval Years	Interval Hours	Duration (days)	Main activities
▯	GO	12	100 000	56	HP, IP and LP cylinder overhaul
◇	BTS	1,5	12 500	14	Boiler and Draught Group inspection Mill bin inspection
△	IR	3	25 000	35	Boiler and turbine auxiliaries inspection and repairs
○	MGO	6	50 000	42	LP cylinder overhaul Boiler statutory inspections Generator stator and rotor inspections

Figure 1: Kusile Outage Philosophy

3.1.2 Applicable S.O.W

The SOW for this contract is detailed as follows:

a) The work will include all planned outages and unplanned outages as per scope of work.

b) Detailed SOW of boiler tubing material

c) Contractor to provide procedures to be approved by Eskom for management of sourcing of boiler tubing and preservation during transportation and storage

d) All tubing must have material certificates witness by AIA as per cert 3.2 requirements

e) Capabilities to supply material within a reasonable duration from receiving order

f) All tubing required as per table below

g) All tubes will be supplied in minimum 6m lengths (ea), the lengths may vary according to mills

h) Boiler tube dimension are in accordance to EN, no deviations from supplied specification without written approval from Engineer.

i) Boiler Tubing must be seamless, colour coded, ends to be capped. To comply to EN 10216-2

j) Tubing to be accompanied with EN 10204 - 3.2 certification.

k) Engineering to be involved during manufacturing stages (QCP to be submitted for intervention points)

l) Desktop review of Mill/Manufacture the supplier intends to use, including PED certificates at submission stage.

m) Physical review of Mill/Manufacture the supplier intends to use prior appointment. Supplier may not change the manufacture without Eskom written approval following the review of new manufacture.

n) Suppliers to comply with Eskom Specification: Eskom Procurement Standard :240-87733094 Rev 3

Table 1: Tube materials and sizes

ITEM NO	MATERIAL NO	DETAILED DESCRIPTION	UNIT	QUANTITY
1	0599480	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 44.5 MM; WALL THICKNESS: 6.3 MM; MATERIAL: 16MO3; LENGTH: 6-11.8 M; STRUCTURE: SMLS; DELIVER AS PER SPEC UNIQUE IDENTIFIER: 474-10206 REV 2	M	1 000.00
2	0598160	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 38 MM; WALL THICKNESS: 6.3 MM; MATERIAL: 16M03; LENGTH: 6-11.8 M; STRUCTURE: SMLS; DELIVER AS PER SPEC UNIQUE IDENTIFIER: 474-10206 REV 2	M	1 200.00
3	0637675	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 44.5 MM; WALL THICKNESS: 6.3 MM; MATERIAL: 16M03; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1.5415; SPECIFICATION: EN10216-2; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER STRATEGIC BOILER TUBES ORDER SPECIFICATION	M	1 000.00
4	0740670	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 25 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 5.6 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2: 16MO3/1.5415TC-2	M	1 000.00
5	0740673	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DIA 25 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 6.3 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT PIPE OUTER DIAMETER: 33.7MM	M	1 000.00
6	0740674	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 25 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 3.6 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2	M	1 000.00
7	0741934	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 25 MM; MATERIAL: 16MO3; LENGTH: 6 M; WALL THICKNESS: 4 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2: 16MO3/1.5415TC-2	M	1 000.00

8	741967	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 25 MM; MATERIAL: CHROME STEEL; LENGTH: 6 M; WALL THICKNESS: 4.5 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; PIPE OUTER DIAMETER = 33.7MM SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 000.00
9	741932	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 25 MM; MATERIAL: 16MO3; LENGTH: 6 M; WALL THICKNESS: 3.2 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2: 16MO3/1.5415TC-2	M	1 000.00
10	0740675	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 50 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 6.3 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2: 16MO3/1.5415TC-2	M	1 000.00
11	741933	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 15 MM; MATERIAL: 16MO3; LENGTH: 6 M; WALL THICKNESS: 3.2 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN10216-2: 16MO3TC-2; SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN10216-2: 16MO3/1.5415TC-2	M	1 000.00
12	741968	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN50 MM; MATERIAL: 16MO3; LENGTH: 6 M; WALL THICKNESS: 4 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN 10216: 16MO3TC-3; PIPE OUTER DIAMETER 60.3MM SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 000.00
13	741970	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 50 MM; MATERIAL: CHROME STEEL; LENGTH: 6 M; WALL THICKNESS: 4.5 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.5415; SPECIFICATION: EN 10216-2: 16MO3TC-2; PIPE OUTER DIAMETER 60.3MM SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 000.00
14	0676581	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 38 MM; WALL THICKNESS: 5.6 MM; MATERIAL: 1.7335; LENGTH: 6 M; STRUCTURE: SMLS; ENDS: PLAIN; SQUARE CUT; DEBURRED; TYPE: WATER TUBE BOILER; GRADE: 13CRMO4-5; SPECIFICATION: ENN10216-2; THE FOLLOWING DOCUMENT SHOULD CONSULTED WHEN ORDERING; 474-10206; STRATEGIC BOILER TUBES ORDER SPECIFICATION; OD TOLERANCE -0.5MM; WD TOLERANCE +12.5 PCT-12.5 PCT INSIDE WITHOUT RUST PROTECTION; OUTSIDE DRY VARNISH; INSPECTION 3.1 EN102004; MATERIAL CERTIFICATE TO BE SUPPLIED	M	1 400.00

15	0644577	TUBE BLR STR:33.7 MM;6.3 MM;13CRMO4-5 TUBE, BOILER STRAIGHT: NOMINAL SIZE: 33.7 MM; WALL THICKNESS: 6.3 MM; MATERIAL: 13CRMO4-5; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1.7335; SPECIFICATION: EN10216-2; REFERENCE NO: HAH21-24 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206: STRATEGIC BOILER TUBES ORDER SPECIFICATION	M	1 400.00
16	740656	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DIA 25 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 5.6 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7335; SPECIFICATION: EN10216-2: 13CRMO4-5TC-2	M	1 200.00
17	740651	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 25 MM; MATERIAL: 13CRMO4-5; LENGTH: 6 M; WALL THICKNESS: 5 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7335; SPECIFICATION: EN10216-2: 13CRMO4-5TC-2; SUPPLY EN 10204 TYPE 3.2 SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2: 13CRMO4-5/1.7335 TC-2 FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT;	M	1 200.00
18	740652	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DIA 25 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 3.2 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7335; SPECIFICATION: EN10216-2: 13CRMO4-5TC-2; SUPPLY EN 10204 TYPE 3.2 SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2: 13CRMO4-5/1.7335 TC-2	M	1 200.00
19	0644576	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 44.5 MM; WALL THICKNESS: 7.1 MM; MATERIAL: 13CRM04-5; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1.7335; SPECIFICATION: EN10216-2; REFERENCE NO: HAD11-14 AC001; THE FOLLOWING DOCUMENT MUST BE CONSULTED WHEN ORDERING 474-10206; STRATEGIC BOILER TUBES ORDER SPECIFICATION	M	1 200.00
20	637676	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 48.3 MM; WALL THICKNESS: 4 MM; MATERIAL: 13CRM04-5; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1.7335; SPECIFICATION: EN 10216-2; REFERENCE NO: HAJ05 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBE ORDER SPECIFICATION; EN 10216-2:2002 TABLE 4	M	1 200.00
21	741971	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 32 MM; MATERIAL: 13CRMO4-5; LENGTH: 6 M; WALL THICKNESS: 6.3 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7335; SPECIFICATION: EN 10216-2: 13CRMO4-5TC-2; PIPE OUTER DIAMETER 42.4 MM SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 200.00
22	740654	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN 40 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 3.6 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7335; SPECIFICATION: EN10216-2: 13CRMO4-5TC-2	M	1 200.00

23	740653	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DIA 50 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 4.5 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7335; SPECIFICATION: EN10216-2: 13CRMO4-5TC-2; SUPPLY EN 10204 TYPE 3.2	M	1 200.00
24	0637589	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 48.3 MM; WALL THICKNESS: 10 MM; MATERIAL: 1.7378; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 7CRM0VTIB10-10; REFERENCE NO: HAH31-32 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; VDTUV MATERIAL SHEET 533:2003.12 USAGE OF 80% OF K-VALUES	M	1 000.00
25	0637588	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 48.3 MM; WALL THICKNESS: 8.8 MM; MATERIAL: 1.7378; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 7CRM0VTIB10-10; REFERENCE NO: HAH31-32 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; VDTUV MATERIAL SHEET 533:2003.12 USAGE OF 80% OF K-VALUES	M	1 000.00
26	0637587	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 44.5 MM; WALL THICKNESS: 5.6 MM; MATERIAL: 1.7378; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 7CRM0VTIB10-10; REFERENCE NO: HAH31-32 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; VDTUV MATERIAL SHEET 533:2003.12 USAGE OF 80% OF K-VALUES	M	1 200.00
27	0637586	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 44.5 MM; WALL THICKNESS: 6.3 MM; MATERIAL: 1.7378; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 7CRM0VTIB10-10; REFERENCE NO: HAH31-32 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBE ORDER SPECIFICATION; VDTUV MATERIAL SHEET 533:2003.12 USAGE OF 80% OF K-VALUES	M	1 000.00
28	0637585	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 44.5 MM; WALL THICKNESS: 7.1 MM; MATERIAL: 1.7378; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 7CRM0VTIB10-10; REFERENCE NO: HAH31-32 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; VDTUV MATERIAL SHEET 533:2003.12 USAGE OF 80% OF K-VALUES	M	1 000.00
29	0746492	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 38 MM; WALL THICKNESS: 4.5 MM; MATERIAL: TP347 HFG; LENGTH: 6 M; STRUCTURE: PLAIN; TYPE: WATER; GRADE: 1,4908; REFERENCE NO: HAH50 AC001-002; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206: STRATEGIC BOILER TUBE ORDER SPECIFICATION; V&M MATERIAL SHEET 439:2006.03 USAGE OF 90% OF K-VALUES; VDTUV 560/2 & ASME CODE CASE 2781	M	1 200.00

30	0746467	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 38 MM; WALL THICKNESS: 5 MM; MATERIAL: TP347 HFG; LENGTH: 6 M; STRUCTURE: PLAIN; TYPE: WATER; GRADE: 1,4908; REFERENCE NO: HAH50 AC001-002; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBE ORDER SPECIFICATION; V&M MATERIAL SHEET 439: 2006.03 USAGE OF 90% OF K-VALUES; VDTUV 560/2 ASME CODE CASE 2781	M	1 000.00
31	0746463	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 38 MM; WALL THICKNESS: 5.6 MM; MATERIAL: TP347 HFG; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1,4908; REFERENCE NO: HAH50 AC001-002; ASME CODE CASE 2781; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; V&M MATERIAL SHEET 439:2006.03 USAGE OF 90% OF K-VALUES; VDTUV 560/2 ASME CODE CASE 2781	M	1 000.00
32	0746979	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 38 MM; WALL THICKNESS: 6.3 MM; MATERIAL: TP347 HFG; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1,4908; REFERENCE NO: HAH50 AC001-002; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; V&M MATERIAL SHEET 439:2006.03 USAGE OF 90% OF K-VALUES; VDTUV 560/2 ASME CODE CASE 2781	M	1 000.00
33	0637598	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 42.4 MM; WALL THICKNESS: 6.3 MM; MATERIAL: TP347 HFG; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1.9912; REFERENCE NO: HAH70 AC001-003; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBE ORDER SPECIFICATION; VDTUV MATERIAL SHEET 547:2003.06; VDTUV DATA SHEET 547 & ASME II-D; CLASSIFIED BY MHPS	M	1 000.00
34	0637615	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 57 MM; WALL THICKNESS: 3.6 MM; MATERIAL: TP347 HFG; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1,4908; REFERENCE NO: HAJ30 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBE ORDER SPECIFICATION; VDTUV MATERIAL SHEET 533:2003.12 USAGE OF 80% OF K-VALUES; VDTUB DATA SHEET547 & ASME II-D; CLASSIFIED BY MHPS	M	1 000.00
35	0637595	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 48.3 MM; WALL THICKNESS: 4 MM; MATERIAL: P265GH; LENGTH: 6 M; STRUCTURE: SMLS; TYPE: WATER; GRADE: 1.0425; SPECIFICATION: EN10216-2; REFERENCE NO: HAJ05 AC001; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 474-10206 - STRATEGIC BOILER TUBES ORDER SPECIFICATION; EN 10216-2:2002 TABLE 4	M	1 200.00
36	0598216	TUBE, BOILER STRAIGHT: NOMINAL SIZE: 48.3 MM; WALL THICKNESS: 4.5 MM; MATERIAL: 10CRMO9-10; LENGTH: 6-11.8 M; STRUCTURE: SMLS; DELIVER AS PER SPEC UNIQUE IDENTIFIER: 474-10206 REV 2	M	1 200.00

37	722367	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN50 MM; WALL THICKNESS: 5 MM; MATERIAL: 10CRMO9-10 (P22); LENGTH: 6 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTIC END CAPS; TYPE: SEAMLESS STEEL PIPE FOR HIGHPRESSUREPURPOSE; GRADE: 1.7380; SPECIFICATION: EN 10216-2:2013+A1:2019 OD 60.3 MM FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT.	M	1 000.00
38	740629	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DIA 32 MM; MATERIAL: ALLOY STEEL; LENGTH: 6 M; WALL THICKNESS: 5.6 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7380; SPECIFICATION: EN10216-2: 10CRMO9-10TC-2; SUPPLY EN 10204 TYPE 3.2 SUPPLY EN 10204 TYPE 3.2 CERTIFICATION EN 10216-2:10CRMO9-10/1.7380 TC-2, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING 240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER	M	1 000.00
39	722322	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN25 MM; WALL THICKNESS: 4.5 MM; MATERIAL: 10CRMO9-10 (P22); LENGTH: 6.0 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTIC END CAPS; TYPE: SEAMLESS STEEL PIPE FORHIGHPRESSUREPURPOSE; GRADE: 1.7380; SPECIFICATION: EN 10216-2:2013+A1:2019 OD33.7WT4.5 EN 10204 TYPE 3.2 CERTIFICATE EN 10216-2:2013+A1:2019 -10CRMO9-10/1.7380 TC-2. FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER	M	1 000.00
40	740631	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DIA 25 MM; MATERIAL: ALLOY STEEL 10CRMO9-10; LENGTH: 6 M; WALL THICKNESS: 3.2 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1.7380; SPECIFICATION: EN10216-2: 10CRMO9-10TC-2; SUPPLY EN 10204 SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 000.00
41	706796	TUBE, BOILER STRAIGHT: NOMINAL SIZE: OD 38 MM; WALL THICKNESS: 4 MM; MATERIAL: X10CRMOVNB9-1; LENGTH: 6 M; STRUCTURE: SMLS; ENDS: PLAIN ; SQUARE CUT; DEBURRED; BOILER PRESSURE PARTS; GRADE: 1.4903; SPECIFICATION: EN10216; ALTERNATIVE NAME T91; THE FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ODERING: 474-12132 TECHNICAL SPECIFICATION FOR THE PROCUREMENT OF BOILER TUBING; ADDITIONAL SPECIFICATION: OD TOLERANCE +0.5MM - 0.5MM; WT	M	1 000.00
42	722361	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN50 MM; WALL THICKNESS: 5 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6 M; STRUCTURE: SEAMLESS PIPE; ENDS: PLASTIC CAP; TYPE: SEAMLESS PIPE FOR PRESSURE PURPOSE; GRADE: 1.4903; SPECIFICATION: EN 10216-2:2013+A1:2019 - X10CRMOVNB9-1 TC2 OD 60.3 MM, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT	M	1 000.00

43	741937	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN32 MM; MATERIAL: X10CRMOVNB9-1; LENGTH: 6 M; WALL THICKNESS: 6.3 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1, 4903; SPECIFICATION: EN 10216-2: X10CRMOVNB9-1TC-2; PIPE OUTER DIAMETER = 38MM SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 000.00
44	722359	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN25 MM; WALL THICKNESS: 4 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTIC END CAPS; TYPE: SEAMLESS STEEL PIPE FOR HIGHPRESSURE PURPOSE; GRADE: 1.4903; SPECIFICATION: EN 10216-2:2013+A1: OD 33.7 MM, EN 10204; TYPE 3.2 CERTIFICATE EN 10216-2:2013+A1:2019, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT	M	1 000.00
45	722364	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN 25 MM; WALL THICKNESS: 5.6 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTIC END CAPS; TYPE: SEAMLESS STEEL PIPE FOR HIGHPRESSUREPURPOSE; GRADE: 1.4903; SPECIFICATION: EN OD 33.7 MM; FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT	M	1 000.00
46	722362	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN25 MM; WALL THICKNESS: 3.2 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTIC END CAPS; TYPE: SEAMLESS STEEL PIPE FOR HIGHPRESSUREPURPOSE; GRADE: 1.4903; SPECIFICATION: EN OD 33.7 MM, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT	M	1 000.00
47	722351	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN 50 MM; WALL THICKNESS: 6.3 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6.0 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTIC END CAPS; TYPE: SEAMLESS STEEL PIPE FOR HIGH PRESSURE PURPOSES; GRADE: 1.4903; SPECIFICATION: OD 60.3 WD 6.3 MM, EN 10204 TYPE 3.2, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT.	M	1 000.00
48	722361	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN50 MM; WALL THICKNESS: 5 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6 M; STRUCTURE: SEAMLESS PIPE; ENDS: PLASTIC CAP; TYPE: SEAMLESS PIPE FOR PRESSURE PURPOSE; GRADE: 1.4903; SPECIFICATION: EN 10216-2:2013+A1:2019 - X10CRMOVNB9-1 TC2 OD 60.3 MM, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT	M	1 000.00

49	722357	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN50 MM; WALL THICKNESS: 3.2 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6.0 M; STRUCTURE: SEAMLESS STEEL PIPE; ENDS: PLASTUIC END CAPS; TYPE: SEAMLESS STEEL PIPE FOR HIGHPRESSURE PURPOSES; GRADE: 1.4903; SPECIFICATION: OD 60.3 X WD 3.2 MM, EN 10204 TYPE 3.2, FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER GENERATION PLANT.	M	1 000.00
50	741940	PIPE, METALLIC: NOMINAL PIPE SIZE DESIGNATION: DN50 MM; MATERIAL: X10CRMOVNB9-1; LENGTH: 6 M; WALL THICKNESS: 3.6 MM; CONSTRUCTION: SEAMLESS HIGH PRESSURE PIPE; END TYPE: PLASTIC END CAPS; GRADE: 1, 4903; SPECIFICATION: EN10216-2: X10CRMOVNB9-1TC-2; PIPE OUTER DIAMETER = 57MM SUPPLY EN 10204 TYPE 3.2 CERTIFICATION	M	1 000.00
51	722360	TUBE, BOILER STRAIGHT: NOMINAL SIZE: DN 40 MM; WALL THICKNESS: 5.6 MM; MATERIAL: X10CRMOVNB9-1 (P91); LENGTH: 6 M; STRUCTURE: SEAMLESS HIGH PRESSURE PIPE; ENDS: END CAPS; TYPE: SEAMLESS PIPE FOR PRESSURE PURPOSES; GRADE: 1.4903; SPECIFICATION: EN10216-2:2013+A1: OD 48.3 MM, EN 10204 TYPE 3.2; FOLLOWING DOCUMENT SHOULD BE CONSULTED WHEN ORDERING240-84513751 MATERIAL SPECIFICATION AND CERTIFICATION GUIDELINE FOR POWER	M	1 000.00
52	706843	TUBE, BOILER STRAIGHT: NOMINAL SIZE: OD 42.4 MM; WALL THICKNESS: 8 MM; MATERIAL: X10CRMOVNB9-1; LENGTH: 6 M; STRUCTURE: SMLS; ENDS: PLAIN; SQUARE CUT; DEBURRED; TYPE: BOILER PRESSURE PARTS; GRADE: 1.4903; SPECIFICATION: EN10216 MATERIAL MUST BE IN ACCORDANCE TO LATEST EN10216-2; ALL TUBES TO BE SUPPLIED WITH THEIR RELEVANT TEST AND MATERIAL CERTIFICATION BS EN 10204/3.2; SUPPLIED BOTH IN HARD AND SOFT COPY ON DELIVERY; FOR USE ON SUPERHEATER	M	1 000.00
53	706857	TUBE, BOILER STRAIGHT: NOMINAL SIZE: OD 42.4 MM; WALL THICKNESS: 6.3 MM; MATERIAL: X10CRMOVNB9-1; LENGTH: 6 M; STRUCTURE: SMLS; ENDS: PLAIN; SQUARE CUT; DEBURRED; TYPE: BOILER PRESSURE PARTS; GRADE: 1.4903; SPECIFICATION: EN10216; MATERIAL MUST BE IN ACCORDANCE TO LATEST EN10216-2; ALL TUBES TO BE SUPPLIED WITH THEIR RELEVANT TEST AND MATERIAL CRTIFICATION BS EN1024/3.2; SUPPLIED BOTH IN HARD AND SOFT COPY ON DELIVERY; FOR USE ON SUPERHEATER 3	M	1 000.00
54	N/a	TRANSPORTATION	KM	180 000.00

3.1.3 Exclusions

Scaffolding and Insulation
Electrical and Control and Instrumentation components
Condition Monitoring
Lubrication
Unauthorised modifications
Civil Maintenance

4. Acceptance

This document has been seen and accepted by:

Name	Designation
Ntsiki Hlapisi	Middle Manager Outages
Siyabonga Mahaye	Manager Outage Execution
Siyakudumisa Mtsweni	Boiler Engineering Manager
Grace Olukune	Engineering Group Manager

5. Revisions

Date	Rev.	Compiler	Remarks
August 2024	1	Musa Ngwane	First issue

6. Development Team

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

- Musa Ngwane
- George Mthimkhulu

7. Acknowledgements

Outage Management Team