Eskom	TUTUKA POWER STATION OUTAGE SCOPE OF WORK	Template Identifier	240-98982530 (Rev 1)
		Doc Identifier	15ENG GEN-192
		Doc Revision	1
		Effective Date	June 2016
		Eskom	Page 1 of 17

FUEL OIL PLANT UNIT 6 IR 2017 SOW	Unit	6
	Genix ID	14738
	Date	April 2017

Outage type	IR (91 days)	**Outage start date**	April 2017
Department	Boiler Engineering	**System**	Fuel Oil Plant
Scope review date	**13/09/2016**		

Details	System Engineer	Engineering Specialist	Engineering Line Manager
Name & Surname	Shaun Barnard	James Sproule	Phil Hoop
Signature			
Date	2016-10-05	2016-10-05	05/10/2016

Details	SCOPE APPROVAL	SCOPE ACCEPTANCE	SCOPE ACCEPTANCE
	Engineering Manager	Outage Coordinator	Outage Manager
Name & Surname	Mehendra Maharaj	Chris Ndlovu	Dumisani Motha
Signature			
Date	2016/10/7	2016/10/11	2016/10/11
Details	Senior Risk Engineer		Outage Execution Manager
Name & Surname	Asheen Maikoo		Mbongeni Nogampula
Signature			
Date	05/10/2016		11/10/16

~~ACCEPTANCE~~ acknowledgement & receipt before closeout.

SCOPE COMPILATION REFERENCES

SOURCE & Ref No.	Yes	No	N/A	Comments
Previous outage service reports		X		No reports received from Maintenance
Return to service data packages		X		
Maintenance Strategy with Rev number			X	15 ENG BLR - 0026
SAP defects (attach list as appendix)				
GHRMS (STEP) reports (Generation Heat Rate Management System)			X	
Online Condition Monitoring			X	No online condition monitoring available
Pre-outage performance test results			X	
Post outage performance test results			X	
GPSS/ Plant Performance data on UCLF incurred			X	
OMS / IIRMS recommendations (Audits Reports)			X	
Risk controls (IRM system)			X	
Previous audits and reviews (e.g. ERAP)			X	
Engineering Change Requests (Projects)	X			Currently no projects do not need to be executed during this outage
LOPP strategy reports			X	
URS				
Philosophy (Outage)			X	No specific outage philosophy on fuel oil plant
Condition Monitoring Report	X			
VA/PHD Viewer trends	X			PGIM trends
Corrective Actions			X	
CARAB reports			X	
Statutory Requirements			X	
Grid code requirements			X	
Waivers and Exemptions			X	
Calibration requirements			X	
Previous Outage SOW variations			X	
Post Mortems Actions from previous outages			X	
Pre–Outage plant walks			X	
Risk based inspection (RBI) report	X			
Simulation, TOIs, OON, SI	X			

SUBSYSTEM	Y / N	Page №
Fuel Oil Plant		
Oil Burner Plant		

CONTENTS

1. GOAL

This outage prepares the unit to achieve the following performance targets with respect to the plant system this scope of work covers:

- UCLF of zero (0)
- UAGS of zero (0)

2. OJECTIVES

2.1 TECHNICAL CRITERIA

- Zero forced shut down for rework after the outage
- Zero trips as a result of outage poor workmanship
- Maintenance to draw up a report on the work done during the outage

2.2 SCOPE VARIATIONS

- N/A

2.3 FINANCIAL PERFORMANCE

N/A

2.4 TIME MANAGEMENT

- Availability of spares is a concern. Maintenance needs to ensure spares are ordered and available before the outage commences.

3. SUMMARY OF THE SCOPE

A brief summary of the scope is given. The scope is put in more detail in section 3.1 and 3.2.

3.1 FUEL OIL PLANT

- HP Pump 6A & 6B : Pumps to be removed and sent to the mechanical workshop to be Stripped and internally inspected for wear. Bearing and mechanical seal to be replaced if damaged
- Control valves : Install a refurbished Askania control valve
- Filtration : Overhaul HP strainers basket changeover valve mechanism
  : Install new filters inserts and baskets
- Fuel Oil Heater 6B 2016) : To be opened, tube bundle removed and cleaned (if not done in October
  : Elements to be inspected, replace damaged elements (ensure 10 spares are available)
- Pipework : NDT testing to be done on the first 3 bends exiting the fuel oil plant
- Attend to all AU defects

3.2 OIL BURNER PLANT

- Oil lances : Strip, refurbish and test all lances
- Oil burner tips tests : 24 oil burner tips to be tested on a test bench
- Oil burner blocks tests : 24 oil burner blocks to be tested on a test bench
- Burner blocks : Strip, refurbish and test all burner blocks
- Flexible hoses : Replace all supply and return flexible hoses
- Attend to all AU defects

PLANT	START	END	EXCLUSIONS	INCLUSIONS	P&ID DRAWINGS
Fuel Oil Plant Control valve	Askania Supply isolating valve	Askania Discharge Isolating valve	Isolating valves Bypass safety valves	Askania control valve Ensure with RTS that the isolating valves are in the open position	21.61/54673
Fuel Oil Plant	Strainer Before High pressure pumps	Strainer Before High pressure pumps	None	Install new filters inserts and baskets (300 micron) Overhaul HP strainers basket changeover valve mechanism	21.61/54673
Fuel Oil Plant	Fuel Oil Booster pump	Askania Supply isolating valve	Non- return valves Isolating valves	FO heater 6B to be opened, Tube Bundle to be removed and cleaned, Elements to be inspected and tested, damaged elements to be replaced	21.61/54673
Fuel Oil Plant	Fuel Oil Pump house	Boiler	None	MPI testing to be done on the first three bends on the pipework leaving the fuel oil plant pump house. For the work to be done scaffolding will have to be erected and lagging and cladding removed	N/A

PLANT	START	END	EXCLUSIONS	INCLUSIONS	P&ID DRAWINGS
Fuel Oil Plant	Booster Pumps	Askania Supply isolating valve	None	HP pumps A & B to be sent to the mechanical workshop for inspection, mechanical seal and bearing replacement Damaged HP pump to be replaced with a new pump for RTS A and B Base plates to be removed and inspected (NDT testing, flatness, rigidity and holding down fixtures to be inspected)	21.61/54673
Oil Burner plant	Supply Isolating Valve	Return Isolating Valve	None	Strip, refurbish and test all blocks, oil lances and tips Replace all the supply and return flexible hoses. C&I modules to be inspected and tested Module boxes to be cleaned. Ensure boxes seal and close properly to minimize dirt ingress	21.61/54679

3.3 GENERAL ARRANGEMENT AND LOCATION DRAWINGS

№	DRAWING NUMBER	TITLE
1	21.61/54673	Fuel Oil Plant unit 4 P&ID
2	21.61/54679	Oil Burner Plant unit 4 P&ID

4. APPLICABLE CORPORATE/GENERATION/INTERNATIONAL GUIDELINES ANDSTANDARDS

№	REFERENCE NUMBER	DOCUMENT TITLE
1	OHS ACT	PRESSURE EQUIPMENT REGULATIONS (REGULATION 347 OF 15 JULY 2009)
2	NWS 1414	FUEL OIL PLANTS FOR FOSSIL FIRED POWER STATIONS
3	36-680	FOSSIL FUEL FIRING REGULATIONS

5. APPLICABLE TUTUKA POWERSTATION STANDARDS AND PROCEDURES

№	REFERENCE NUMBER	DOCUMENT TITLE
1		Outage Philosophy for Tutuka Power Station

6. GENERAL CONSIDERATIONS

ACTIVITIES	SPECIFICATIONS
PRE-REQUISITES / PRE-CONDITIONS	
Ensure the sumps are drained before draining the system	
Ensure the system is drained before executing the scope	
Ensure the required spares are available 2 weeks prior to the unit shut down	
SAFETY	
Fire risk	
Slip, trip and fall risk	
ENVIRONMENT	
Leaking fuel oil is an environmental risk	

QUALITY	
Process Quality Process/Procedure (PQP/QCP) Work on the Fuel Oil Plant shall be carried out in accordance with the relevant approved PQP. The PQP shall be compiled by the maintenance department based on this scope of work and submitted to Engineering at least 2 months before the outage for approval. The QCP shall include the work that will be performed both outside the Power Station as well as on site	
Hold and witness points • H&W points that form part of the QCP and have been approved prior to the start date, shall not be by-passed under any circumstances without the written concession of an authorised member of the Engineering Department. It is the Contractors responsibility to inform the Plant Engineer or his representative at the daily progress meetings when an activity will be ready for QC.	
Check Sheets Inspections to be carried out in accordance with check sheets as attached in master quality plan (QCP). All disassembly and assembly values to be recorded in relevant check sheets. No incomplete check sheets will be accepted unless the prior exemption in terms of the technical notification is obtained from Engineering. NCR will be issued for incomplete check sheets. Repair or replace all damaged/worn components out of specification or obtain a concession from engineering staff. All abnormalities to be recorded and reported with technical notifications.	OEM requirements specifications to be used on specifications unless approval to be obtained from Engineering
Quality technicians QC Technicians will be appointed by the Outage Manager. Plant Engineers to verify quality standards and ensure quality assurance is exercised during the repairs, replacement or refurbishment. Plant engineers may also delegate the final signing authority to a suitably qualified person	
Experience of staff All Engineers, technicians, supervisors and quality assurance related staff should have adequate experience to work on specified activities.	
General Requirements	
The importance of correct equipment spares and procedures should be included in structured toolbox talk sessions with all maintenance and contractors	

* * * Communication Result Report (5.Oct. 2016 8:43) * * *

1)
2)

Date/Time: 5.Oct. 2016 8:42

File No. Mode	Destination	Pg(s)	Result	Page Not Sent
0670 Memory TX	9124	P. 1	OK	

Reason for error

E. 1) Hang up or line fail	E. 2) Busy
E. 3) No answer	E. 4) No facsimile connection
E. 5) Exceeded max. E-mail size	E. 6) Destination does not support IP-Fax

Eskom	TUTUKA POWER STATION	UNIQUE IDENTIFIER	
		DOCUMENT TYPE	TUTUKA FM
	MEALS ORDERING FORM	REVISION	0
		EFFECTIVE DATE	JULY 2014

Date	**5 October 2016**
Pick up Point (i.e. Canteen/Admin)	**Canteen**
Department (i.e. C&I Maintenance)	**Electrical Engineering**
Order Placed By (Name & Surname)	Sabelo Nene — **Tel Ext** 9256

Please use this fax number to order meals (9124)

Unique Number	Initials & Surnames	Take away	Pap	Rice	Vegetarian Meal	Health Meal	Pap	Rice
3980184	S Nene		1					
4536198	U Ellapen							1

Please note the following:

- *Use the fax number that is provided above.*
- *Always fax before 09:30 not later than that.*
- *All Hot meals must be collected at the Canteen by the responsible person.*

Spares It should be kept in mind that lead time of oil burner required during overhauls can be as much as 3 months. Therefore all the spares required will be ordered in time. Spares ordered and used will be reported by always quoting the ESKOM stock number (if applicable) as well as the Group and item number from the spares manuals.	
Documentation Full service reports must be compiled and submitted to the Documentation Centre for safe keeping and approval 40 days after unit is synchronised on load	
Equipment Measuring equipment: An up to date calibration certificate must be available for all measuring equipment that will be used.	
Use of SAP PM to record history and costs SAP PM will be used to record history of work done and the related costs to at least the second level of headings as listed in this document.	
EXISTING DEFECTS	
A list of all defects loaded before the submission of this SOW are attached	Attached defect list

7. DETAIL SCOPE OF WORK: DECOMMISSIONING AND PRESERVATION SCOPE

SUBSYSTEM		DECOMMISSIONING AND PRESEVATION				
COMPONENT ACTIVITIES					GOVERNING DOCUMENTS	
№	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	WORK SPECIFICATIONS	CHECK SHEET NO.	INTERVENTION POINTS (H/W/R)
		N/A	N/A	N/A		

SUBSYSTEM		FUEL OIL PLANT			
COMPONENT ACTIVITIES				GOVERNING DOCUMENTS	
№	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	WORK SPECIFICATIONS	CHECK SHEET NO.	INTERVENTION POINTS (H/W/R)
1	06NL02W001	**Fuel Oil Heater 6B**	FO heater 6B to be opened, Tube Bundle to be removed and cleaned, Elements to be inspected and tested, damaged elements to be replaced			
2	06NL00G001-KT01	**HP Strainer**	Install new filters inserts and baskets (300 micron) **Overhaul HP strainers basket changeover valve mechanism**			
3	06NL03D001 06NL04D001	**Allweiler positive displacement pump**	Pumps needs to be removed to the mechanical workshop for inspection. Mechanical seal and bearing to be replaced if the pump is in an acceptable condition. Replace if damaged.			
4	06NL06S001	**Askania control valve**	Replace/refurbish Valves must be pressure tested after work or inspection			
5	06NL03D001 06NL04D001	**Fuel Oil HP pump base plates**	The flatness, rigidity and holding-down fixtures also need to be checked. The holding down fixtures refers to the pump and motor to baseplate and baseplate to the foundations. Pump must also be aligned to the pipework so that a stress free connection can be made. NDT testing to be done.			
6		**Pipework**	MPI testing to be done on the first three bends of the pipework exiting the fuel oil plant. Will require scaffolding and removal of lagging and cladding. Replace after tests have been conducted			

SUBSYSTEM		OIL BURNER PLANT				
COMPONENT ACTIVITIES					GOVERNING DOCUMENTS	
№	COMPONENT FLOC (KKS CODE)	COMPONENT DESCRIPTION	ACTIVITY TYPE (INSPECTION / TEST / REFURBISH / REPLACE)	WORK SPECIFICATIONS	CHECK SHEET NO.	INTERVENTION POINTS (H/W/R)
1	06NL11S001-06NL64S001	**Oil Burner**	All Lances/blocks and tips to be stripped, refurbished and tested			
2	06NL11S101-06NL64S101	**Supply flexible hose**	The flexible steel hoses should be replaced.	All hoses are subjected to pressure testing. All the flexible hoses require pressure test certificates.		
3	06NL11G001-06NL64G001	**Burner strainers**	Oil Burner strainers to be cleaned			

8. BUDGET BILLS OF MATERIAL

(SOW OF WORK VARIATION WILL BE ISSUED ONLY IF REFURBISMENT OR REPLACEMENT COMPONENTS EXCEED BUDGET. OTHERWISE CUTTING INSTRUCTION WILL BE USED TO COMMUNICATE WHICH COMPONENTS MUST BE REPLACED OR REFURBISHED)

SUBSYSTEM							
№	REPLACE/ REFURBISH	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	OPERATING PARAMETERS	PART / NUMBER	STOCK NUMBER	DESIGN QUANTITY
1		Tips	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		50678	24
2		Inner Lances	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		225986	24
3		Hi/Low fire Inserts	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		186041	24
4		Hi/Low fire spools	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		53958	
5		Lance poppet O-rings	OEM spare (Safurnco) Level 1 plant				200
6		Spring kit	OEM spare (Safurnco) Level 1 plant			98162	50
7		Block Seal kit	OEM spare (Safurnco) Level 1 plant			98162	30
8		Lance hand wheel/spindles	OEM spare (Safurnco) Level 1 plant				24

9		Pintles	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		66084	24
10		Atomisers	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		66954	24
11		Back plates	OEM spare (Safurnco) Level 1 plant	4.2 MPa 100°C fuel oil		50727	24
12		Hose fittings				50671	20
13		Pump strainer baskets and inserts	OEM spare (Safurnco) Level 1 plant				4
14		Copper washers					50
15		THB32 Oil 210 L					1
16		Supply flexible hoses		4.2 MPa 100°C fuel oil		56443	24
17		Return flexible hoses		4.2 MPa 100°C fuel oil		56442	24
18		Allweiler Positive displacement pump insert		100°C fuel oil			1
19		Fuel Oil Heater Elements	Level 1 plant	800 kPa 100°C fuel oil			10