



Turbine Engineering Department
Tutuka Power Station
Thuthukani, Standerton 2430
Telephone 017 749 5675
Cell Phone 076 894 1458

MEMORANDUM

To:	Wilson Kudiwa	From:	Mahlatse Lapatla
Department:	Turbine Engineering	Department:	Turbine Engineering
Date:	2024-02-13	Your Ref.:	Our Ref.: Enquiries: Mahlatse Lapatla (017) 749 5675
SUBJECT: Tutuka Mobile Purification system			

1. BACKGROUND

The Turbine hydraulic control oil is a phosphate ester fire resistance fluid commonly known as FRF. The hydraulic unit comprises of an FRF tank, divided into two compartments, which is the working tank and the storage tank. The capacity of each tank is 1640L, with the working tank levels maintained at 75% and the storage tank maintained 25% capacity. The hydraulic control oil used at Tutuka for turbine control, is Castrol Anvol PE 46 XC. Following is the required minimum turbine oil condition. The mobile oil conditioner should be connected at the working tank.

The Main Turbine and Boiler Feed Pump Turbine (BFPT) lubrication system uses the Castrol Perfecto THZ 32. These two systems have independent oil tanks, the Main turbine main oil tanks (MOT) situated at the main oil room and the BFPT tank is situated at the zero-meter level.

2. GENERAL REQUIREMENTS

All the work mentioned in this scope of work is the responsibility of the *Contractor* except where specifically noted otherwise. The *Contractor* shall provide a Vacuum Dehydration Mobile Oil Conditioner to Tutuka Power Station with the specification listed below:

1. The type of the mobile conditioner shall be of a vacuum dehydration type and shall maintain a back pressure or vacuum between **70 kPa - 80kPa** during oil conditioning.
2. The *contractor* shall ensure that the supplied mobile oil conditioner is able to handle the FRF oil -Anvol PE 46XC.
3. The *contractor* shall ensure that the supplied mobile conditioner is always in-service during the purification period.
4. The oil cleanliness level or particle count shall be performed as per **ISO 4406:2017**, the cleanliness level shall be below **15/13/11**.
5. The oil conditioner should be equipped with a highly efficient particulate filtration system to maintain the ISO cleanliness level of **16/13/11** or better.
6. The mobile conditioner should be fitted with highly efficient particulate filtration system. It is the *contractor's* responsibility to constantly change the filters when blocked.
7. The mobile conditioner shall be fitted with acid control system. The acid control system may consist of Fullers earth filters, Ion exchanger or Selexsorb. The acid control system shall maintain the Total Acid Number (TAN) of less than **0.2 mgKOH/g**.
8. The total acid number shall be tested as per the requirement of ASTM D974/D 664
9. The Mobile Conditioner shall be capable of removing free water/moisture such that the waters content is below **150 PPM**.
10. The oil conditioner should be capable of removing free water/moisture from the LP Bypass hydraulic oil to a level below **200 PPM**.
11. The *Contractor* shall ensure that the oil temperature is maintained at **50°C - 60°C** at all times. The conditioner shall be fitted with an electric heater equipped with a thermostat to automatically control the temperature to the required limits.

12. The Mobile Conditioner shall be able to circulate **2.67 l/m** of FRF during normal operation.
13. The *contractor* shall conduct repairs or maintenance activity of the mobile purifier as required.
14. The Mobile purifier shall have a Vacuum Pressure & Temperature gauge respectively.
15. The *Employer* should confirm the performance of the purifier by conducting LAB analysis of the oil from time to time.

3. GENERAL SCOPE OF WORK

I. WATER REMOVAL

The CJC® Filter Separator removes water from oil to very low levels. The efficiency of water removal depends on the oil type, age and temperature.

II. PARTICLE REMOVAL

- 3 µm abs.: 98.7% of all solid particles >3 µm.
- 0.8 µm nom: 50% of all solid particles >0.8 µm.

III. MOBILE PURIFICATION TECHNICAL DATA

Model PTU3 MULTISTAY		2 Stay 2 x 27/108		+ 1 Stay + 1 x 27/108
Pump flow, per hour (std.)	litres	900-1700		+400-800/+106-211
Pump type	P/MZ/GP			P/MZ/GP
Pump inlet pressure, max.	bar		0.5/7 8.0/116	-
Filter Inserts 27/27, std.:	pcs.	8		+4
Separator Element PTU3	pcs.	2		+1
Power consumption , aver.	kW	0.75-4.0		+0.25-1.0
Pressure drop, max.	bar	1.8		-
Oil temperature, max.*)	°C	80		-

Dirt holding capacity, appr.	ltr	16-32	+8-16/+2.1-4.2
Dry weight	kg	300-380	+150-190/+331-419
Operating weight, wet	kg	320-450	+170-225/+375-496
Design pressure, filter	bar	7	-
Ambient temperature, max.	°C	40	-

Compiled by: Mahlatse Lapatla



**System Engineer - Centreline
Turbine Engineering**

Date..... 13-02-2024

Supported by: Wilson Kudiwa



Turbine Engineering Manger

Date..... 14-02-2024