



**Peaking Generation  
Ankerlig Power Station**

Doc No.: 192/E/6	Rev: 02
Form No.: 167A/158-A	Rev. 07
HBS: CFE	Page 1 of 7
Doc Type: Work Package	
Task List No:	

**SYSTEM:** CONTINUOUS EMISSION MONITORING SYSTEM

**ITEM:** EMISSION MONITORING EQUIPMENT

**PURPOSE:** INSPECTION AND CALIBRATION OF EMISSION MONITORING EQUIPMENT

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REV	DATE	REVISION NOTE	AUTHORISED BY
01	Aug 2013	Document updated to new format and 'Tick Blocks' added	R. Booth
02	Sep 2015	Document updated by Shaun Moodley to include SO2 calibration	R. Booth

**SEE PAGE 2 FOR CONTENTS**

<b>CONFIDENTIALITY CLASSIFICATION:</b>  CONTROLLED DISCLOSURE	<b>DATE OF LAST REVIEW:</b> Sep 2015
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Promotion of the Access to Information Act 2000 (Refer to the list on Procedure GGP1067) NOTE: - These dates can be changed without effecting the revision status of the document

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## 1. Risk Analysis and Safety Precautions

- 1.1 All work must be carried out in accordance with Eskom Plant Safety and HV Regulations.
- 1.2 Nature of work and related dangers understood by all.
- 1.3 Explain the scope of work to the Operating Department.
- 1.4 Comply with safety regulations when working with pressurized gas cylinders.

## 2. References

- 2.1 Central Emission Monitoring Manual Vol. 1/5 (C00.407.CEMS.TP6.01+), Vol. 2/5 (C00.407.CEMS.TP6.02+)

## 3. Tools and Equipment

- 3.1 Gas cylinder.
- 3.2 Gas pressure regulator.
- 3.3 Tool kit.
- 3.4 Vacuum cleaner.

## 4. Spares and Materials

- 4.1 Filter element 20 qm
- 4.2 Filter element 2 qm.
- 4.3 Filter element MDE123.
- 4.4 Oxygen sensor.
- 4.5 Silicone tube set.
- 4.6 Test gas – NO,CO,SO<sub>2</sub>

## 5. Resource Requirements

- 5.1 1 competent person.
- 5.2 Planned time: ± 3 hours.
- 5.3 Frequency – yearly.

## 6. Pre-Job Brief

- 6.1 Tool box talk to be done before work commences.

## 7. Pre-conditions

- 7.1 Unit not in load operation.
- 7.2 Pressure of the test gas cylinder to be above 5 bar.
- 7.3 Test gas stability time has not lapsed. (Material safety data sheet)

## 8. Procedure

STEP	ACTION - GENERAL EQUIPMENT CHECKS	CHECK
8.1	Test lamps and bulbs on the indication panel and replace if necessary.	
8.2	Check the cleanliness of the compartment and if necessary remove dust with a vacuum cleaner.	✓
8.3	Check the operation of the air conditioner and heater in the compartment.	✓
8.4	Perform visual check of all filters in the compartment. Discoloration of the filter inserts (brown, yellow) are an indication of fouling. In case of fouling replace the filter elements.	✓
8.5	Check the status of the oxygen sensor. Replace the sensor if the voltage drops below 6 mV.	✓
8.6	Check the status of the silicon tubes in the gas cooler condensate pumps. Replace the tubes if they are leaking.	✓
8.7	Check functionality of remote alarms to the DCS (T3000).	✓
<b>NO &amp; CO ANALYSER CALIBRATION CHECK</b>		
8.8	Calibration check of the span points of the Ultramat gas analyser.	✓
8.8.1	Connect the gas bottle to the test gas tube fitting on the side of the interior cabinet.	✓
8.8.2	Switch over the system to maintenance mode by pressing the "Maint" pushbutton on the operator panel.	✓
8.8.3	Switch over to test gas feed by pressing the "Test Gas" pushbutton on the operator panel.	✓
8.8.4	Open the pressure regulating valve slowly until a pressure of +/- 0.2 bar is reached on the pressure regulator gauge. Adjust the pressure regulator to maintain a flow of 60 – 80 l/h as indicated on the flow adjustment panel.	✓
8.8.5	Purge the system with the test gas for at least 5 minutes before comparing the analyser display readings with the test certificate values. Record the NO and CO readings on the record sheet.	✓
8.8.6	In case of a more than 2 % deviation the analyser has to be re calibrated.	✓
8.8.7	If analyser is within specification purge system with air for 5 minutes before returning to service.	✓
<b>NO &amp; CO CALIBRATION</b>		
8.9		
8.9	Calibration of IR channels.	
8.9.1	On the Ultramat menu select "Calibration" → "Calibrate IR channels" → "Choose component" → "Set span gas values" → "Start calibration" →	✓
8.9.2	If the reading is stable press "enter"	✓
8.9.3	Press "esc" to return.	✓
8.9.4	After calibration switch the analyzer to measuring mode by pressing the "meas" button on the Ultramat gas analyzer.	✓
8.9.5	Disconnect the gas cylinder.	✓
8.9.6	Switch the system over to automatic mode by first pressing the "maint" and then the "autom" button on the operator panel.	✓

10.53mV

SO<sub>2</sub> - 43  
CO - 126  
H<sub>2</sub>O - 188

### 9. SO2 ANALYSER CALIBRATION CHECK

9	Calibration check of the span points of the Ultramat gas analyser.	✓
9.1	Connect the gas bottle to the test gas tube fitting on the side of the interior cabinet.	✓
9.2	Switch over the system to maintenance mode by pressing the "Maint" pushbutton on the operator panel.	✓
9.3	Switch over to test gas feed by pressing the "Test Gas" pushbutton on the operator panel.	✓
9.4	Open the pressure regulating valve slowly until a pressure of +/- 0.2 bar is reached on the pressure regulator gauge. Adjust the pressure regulator to maintain a flow of 60 – 80 l/h as indicated on the flow adjustment panel.	✓
9.5	Purge the system with the test gas for at least 5 minutes before comparing the analyser display readings with the test certificate values. Record the SO2 readings on the record sheet.	✓
9.6	In case of a more than 2 % deviation the analyser has to be re calibrated.	✓
9.7	If analyser is within specification purge system with air for 5 minutes before returning to service.	✓
<b>SO2 CALIBRATION</b>		
		✓
9.7	Calibration of IR channels.	✓
9.7.1	On the Ultramat menu select "Calibration" → "Calibrate IR channels" → "Choose component" → "Set span gas values" → "Start calibration" →	✓
9.7.2	If the reading is stable press "enter"	✓
9.7.3	Press "esc" to return.	✓
9.7.4	After calibration switch the analyser to measuring mode by pressing the "meas" button on the Ultramat gas analyser.	✓
9.7.5	Disconnect the gas cylinder.	✓
9.7.6	Purge system with air for 5 minutes before returning to service.	✓
9.7.7	Switch the system over to automatic mode by first pressing the "maint" and then the "autom" button on the operator panel.	✓

### 10. Work Package Recordings



Peaking Generation  
Ankerlig Power Station

Record No:

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DOCUMENT TYPE: WORK PACKAGE RECORDINGS

SYSTEM: CONTINUOUS EMISSION MONITORING SYSTEM

ITEM: EMISSION MONITORING EQUIPMENT

PURPOSE: INSPECTION AND CALIBRATION OF EMISSION MONITORING EQUIPMENT

### Control cubicle checks

	Yes	No
Is there any indication of rodents, insects or moisture problems?		✓
Are all the panel indication lamps working?		✓
Cubicle cleaned?	✓	
Any of the filters changed? (If yes, specify which under comments)	✓	
Is the heater / air conditioning working?	✓	

Comments: Automatic & Calibration indication lamps not working  
\*Change ambient air filter

### Alarm & Indication checks

	Yes	No
**CFE01GH001A XJ31 – CEMS FAULT (WARNING)	✓	
**CFE01GH001B XJ31 – CEMS CAL /MAINTENANCE ON (STATUS)	✓	
**CFE01GH001D XJ32 – CEMS MAINTENANCE REQUIRED (WARNING)	✓	

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Oxygen Sensor

Record the mV reading of the oxygen sensor.

10,53 mV

**Analyzer measurements**

	MSDS VALUE	ANALYSER VALUE BEFORE CALIBRATION	AFTER CALIBRATION
NO	188	180	189
CO	126	123	126
SO2	43	40	43

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PM (Works) Order No: 715457834

Unit No.: 21

Date: 2016/09/19

Task Duration: 4.5 hours

Permit No.: 86263

R/P: SW LINDA  
 (Print Name)

Worker's Reg. No.: N/A

Feedback: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Post-Job Brief:**

- Can this work package be improved? YES / NO  
 - Were any lessons learnt or additional risks identified? YES / NO

What? \_\_\_\_\_  
 \_\_\_\_\_

- Notification was raised if required? YES / NO / N/A

Not. #: \_\_\_\_\_

Specify any corrective action/ follow-up: \_\_\_\_\_  
 \_\_\_\_\_

**PERFORMED BY:**  
 Name: SW LINDA  
 Date: 2016/09/19  
 Signature: [Signature]

**SUPERVISOR:**  
S. Nadej  
16/09/19  
[Signature]