

PEAKING GENERATION INSPECTION AND CALIBRATION OF EMISSION MONITORING EQUIPMENT	Doc No.: 192/E/6	
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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,SO2

5. Resource Requirements

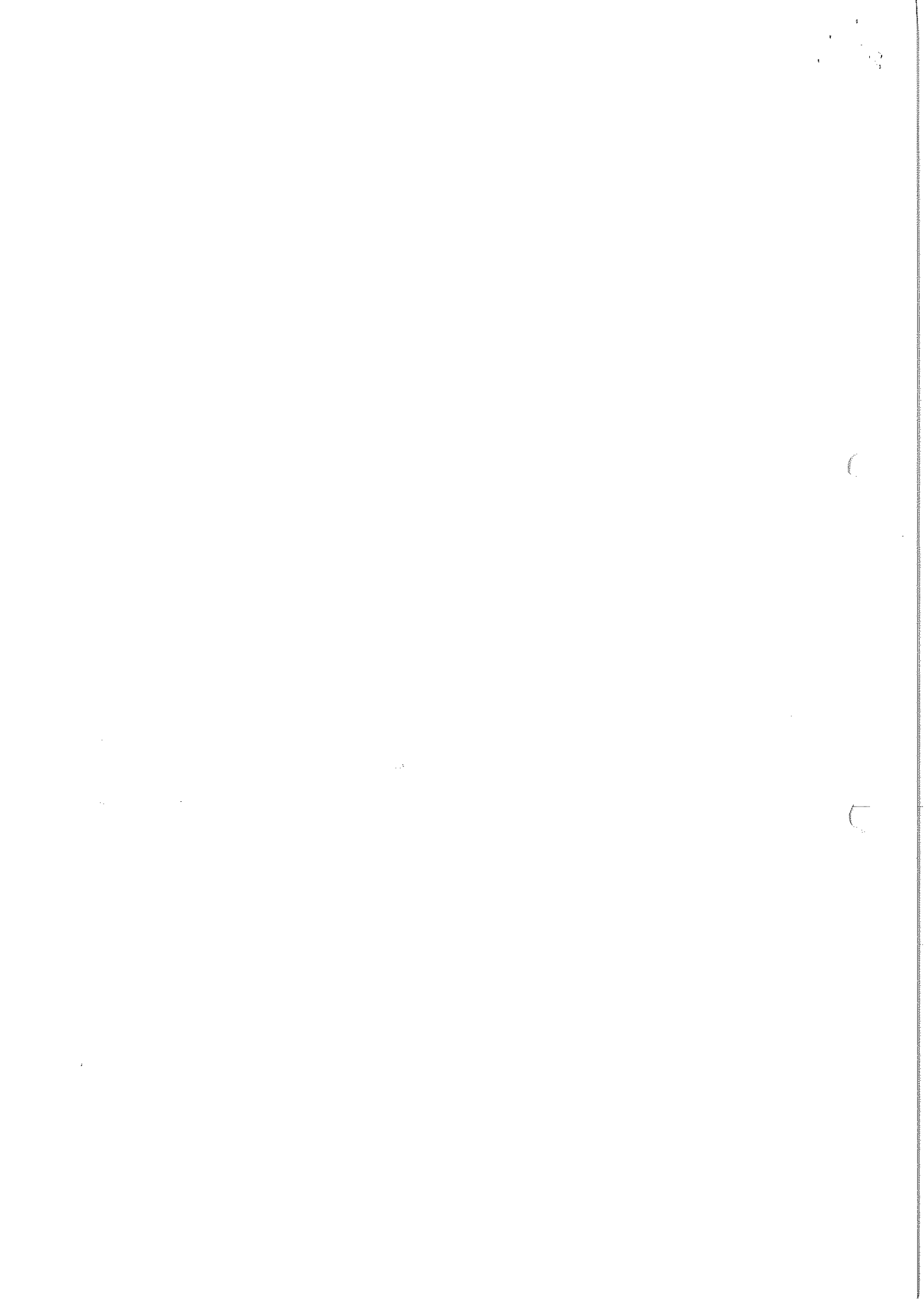
- 5.1 1 competent person.
- 5.2 Planned time: ± 3 hours.
- 5.3 Frequency – yearly.

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) ✓



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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).	✓
NO & CO ANALYSER CALIBRATION CHECK		
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.	✓
NO & CO CALIBRATION		
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.	✓

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.	✓
SO2 CALIBRATION		
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:	
		Form No.: 192/E/6-A	Rev. 02
		HBS: CFE	
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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 _____

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.

12.23 mV

Analyzer measurements

	MSDS VALUE	ANALYSER VALUE BEFORE CALIBRATION	AFTER CALIBRATION
NO	188.002	189 mg/m ³	188 mg/m ³
CO	126.07	126 mg/m ³	126 mg/m ³
SO2	42.9256	40 mg/m ³	43 mg/m ³

Comments _____

PM (Works) Order No: _____

Unit No.: 31

Date: 10/03/2017

Task Duration: _____

Permit No.: _____

R/P: VL MEYER
 (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: VL MEYER
 Date: 10/03/2017
 Signature: [Signature]

SUPERVISOR:
A. Folster
16.3.17
[Signature]