

HENDRINA POWER STATION MONTHLY EMISSIONS REPORT

Atmospheric Emission License 17/4/AEL/MP312/11/16



1 RAW MATERIALS AND PRODUCTS

| Raw Materials and Products | Raw Material Type | Units | Max. Permitted Consumption Rate | Consumption Rate Jul-2024 |
|----------------------------|---------------------------|--------|------------------------------------|---------------------------|
| | Coal | Tons | 820 000 | 276 454.0 |
| | Fuel Oil | Tons | 3 200 | 1897.63 |
| Production Rates | Product / By-Product Name | Units | Max. Production Capacity Permitted | Production Rate Jul-2024 |
| | Energy | GWh | 1488 | 406.96 |
| | Ash | Tons | 290 000 | 69 065 |
| | RE PM | kg/MWh | not specified | 0.17 |

2 ENERGY SOURCE CHARACTERISTICS

| Coal Characteristics | Units | Stipulated Range | Monthly Average Content |
|----------------------|-------|------------------|-------------------------|
| Sulphur Content | % | 0.6 to < 1 | 0.60 |
| Ash Content | % | 20 to < 35 | 22.45 |

3 EMISSION LIMITS (mg/Nm³)

| Associated Unit/Stack | PM | SO ₂ | NO _x |
|-----------------------|----|-----------------|-----------------|
| North | 50 | 3200 | 1100 |
| South | 50 | 3200 | 1100 |

4 ABATEMENT TECHNOLOGY (%)

| Associated Unit/Stack | Technology Type | Efficiency Jul-2024 |
|-----------------------|---------------------------|---------------------|
| Unit 1 | Fabric Filter Plant (FFP) | Unit Off-line |
| Unit 2 | Fabric Filter Plant (FFP) | 99.96% |
| Unit 3 | Fabric Filter Plant (FFP) | Unit Off-line |
| Unit 4 | Fabric Filter Plant (FFP) | Unit Off-line |
| Unit 5 | Fabric Filter Plant (FFP) | 99.95% |
| Unit 6 | Fabric Filter Plant (FFP) | 99.95% |
| Unit 7 | Fabric Filter Plant (FFP) | 99.96% |
| Unit 8 | Fabric Filter Plant (FFP) | Unit Off-line |
| Unit 9 | Fabric Filter Plant (FFP) | Unit Off-line |
| Unit 10 | Fabric Filter Plant (FFP) | 100% |

Note: Abatement plant does not have bypass mode operation, hence plant 100% Utilised.

5 MONITOR RELIABILITY (%)

| Associated Unit/Stack | PM | SO ₂ | NO | O ₂ | CO ₂ |
|-----------------------|-------|-----------------|-------|----------------|-----------------|
| North | 100.0 | 81.2 | 100.0 | 100.0 | 98.76 |
| South | 99.1 | 100.0 | 100.0 | 99.9 | 100 |

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO₂

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of July-2024

| Associated Unit/Stack | PM (tons) | SOx (tons) | NOx (tons) |
|-----------------------|-----------|------------|------------|
| North | 10.6 | | |
| South | 58.5 | 3 092.9 | 1 473.0 |
| SUM | 69.1 | 3 092.9 | 1 473.0 |

Table 6.2: Operating days in compliance to PM AEL Limit - July 2024

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average PM (mg/Nm³) |
|-----------------------|--------|-------|------------|---------------|------------------|---------------------|
| North | 29 | 0 | 0 | 0 | 0 | 10.8 |
| South | 24 | 4 | 3 | 0 | 7 | 45.4 |
| SUM | 53 | 4 | 3 | 0 | 7 | |

-North Stack SO₂ issue due to monitor defects. Mitigation measures outlined at section 9 of this report: General

Table 6.3: Operating days in compliance to SO₂ AEL Limit - July 2024

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average SO ₂ (mg/Nm³) |
|-----------------------|--------|-------|------------|---------------|------------------|----------------------------------|
| North | | | | | | |
| South | 31 | 0 | 0 | 0 | 0 | 2 104.6 |
| SUM | 33 | 0 | 0 | 27 | 27 | |

-North Stack NO₂ issuedue to monitor defects. Mitigation measures outlined at section 9 of this report: General

Table 6.4: Operating days in compliance to NOx AEL Limit - July 2024

| Associated Unit/Stack | Normal | Grace | Section 30 | Contravention | Total Exceedance | Average NOx (mg/Nm³) |
|-----------------------|--------|-------|------------|---------------|------------------|----------------------|
| North | | | | | | |
| South | 24 | 0 | 0 | 7 | 7 | 994.0 |
| SUM | 24 | 0 | 0 | 36 | 36 | |

Table 6.5: Legend Description

| Condition | Colour | Description |
|---------------|--------|--|
| Normal | | Emissions below Emission Limit Value (ELV) |
| Grace | | Emissions above the ELV during grace period |
| Section 30 | | Emissions above ELV during a NEMA S30 incident |
| Contravention | | Emissions above ELV but outside grace or S30 incident conditions |

Figure 1: Hendrina North Stack PM Emissions - July 2024

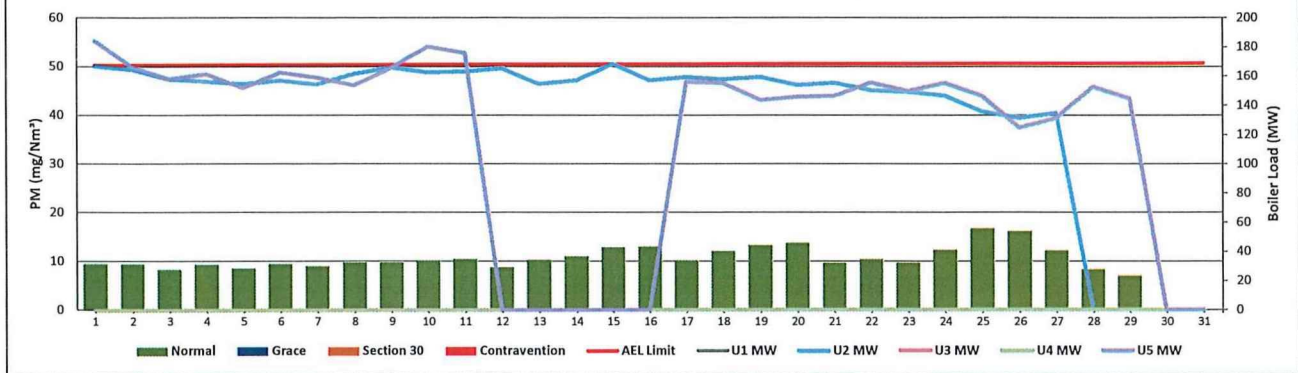
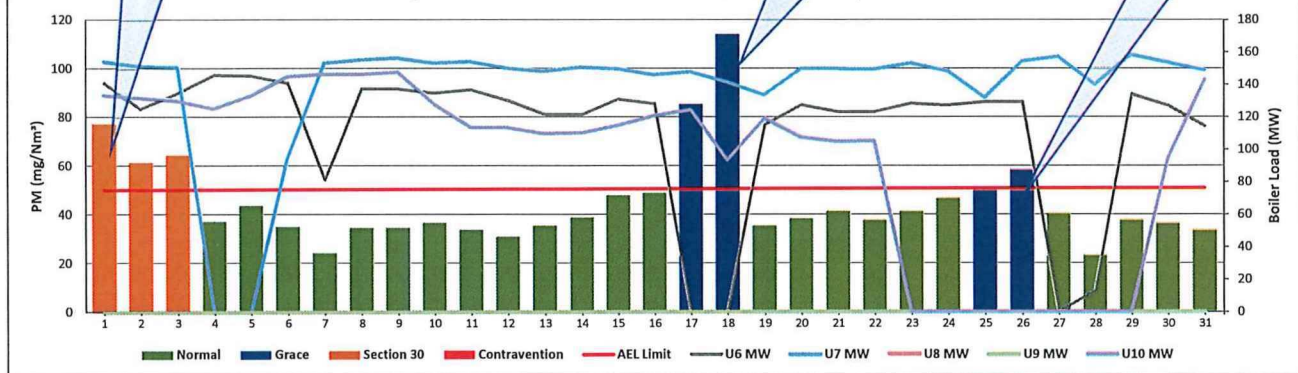
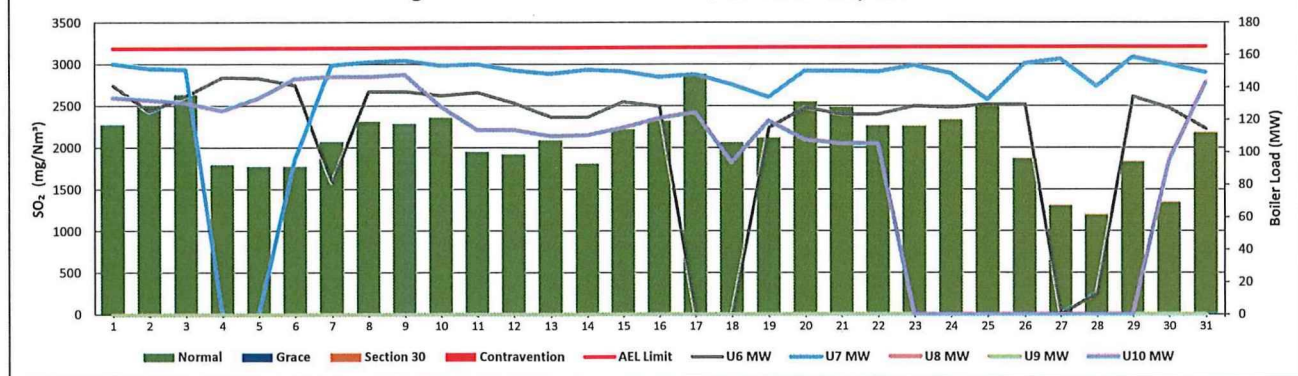
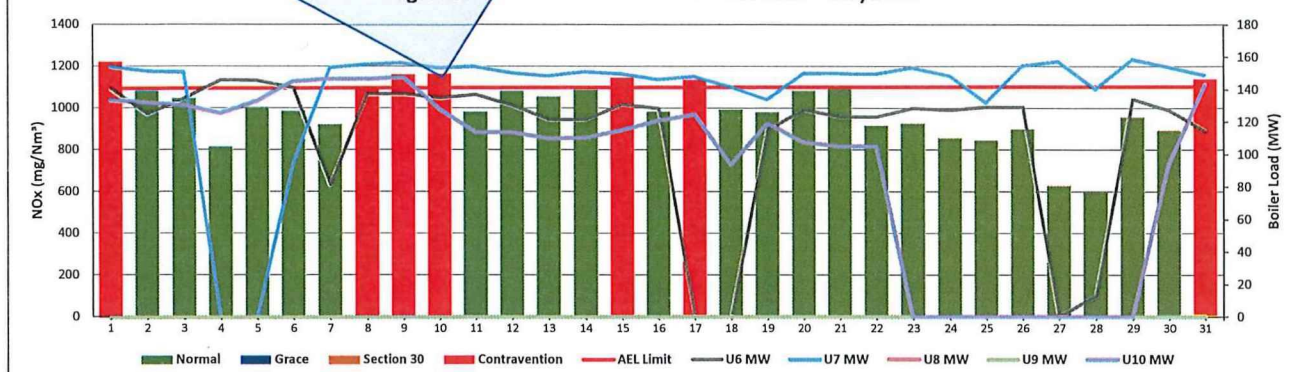


Figure 2: Hendrina South Stack PM Emissions - July 2024

Figure 4: Hendrina South Stack SO₂ Emissions - July 2024

On the highlighted exceedances (red), there was a drift on the Oxygen analyser signal which went high and later became normal. This has been reported to the OEM of the analyser and are waiting for the repair of the O2 analyser.

Figure 6: Hendrina South Stack NOx Emissions - July 2024



Gaseous Emission Trends (NOx and SOx) for the North Stack have been removed due to suspected erroneous data from the Continuous Emission Monitoring System (CEMS).

Spot Checks measurements have been performed internally and they confirm the error.

The Station has conducted correlation and parallel tests for both stacks via services of a SANAS Accredited service provider and the final report is awaited. The station shall implement the correlation factors once the reports are received from the service provider and they shall be shared with the Licencing Authority.

7 SHUT DOWN AND LIGHT UP INFORMATION

Table 7.1 PM Start-up information for the month of July-2024

| North Stack | Event 1 | | Event 2 | | Event 3 | | Event 4 | |
|--|----------|------------|-------------|-------------|----------|------------|----------|----------|
| Unit No. | Unit 2 | | Unit 5 | | Unit 5 | | no event | |
| Breaker Open (BO) | 7:45 am | 2024/07/27 | 11:25 pm | 2024/07/11 | 9:35 pm | 2024/07/29 | | |
| Draught Group (DG) Shut Down (SD) | 12:45 pm | 2024/07/28 | 9:45 am | 2024/07/12 | 2:15 pm | 2024/07/30 | | |
| BO to DG SD (duration) | 01:05:00 | DD:HH:MM | 00:10:20 | DD:HH:MM | 00:16:40 | DD:HH:MM | | DD:HH:MM |
| Fires in time | | | 2024/07/17 | 2024/07/17 | | | | |
| Synch. to Grid (or BC) | | | 2:40 pm | 2024/07/17 | | | | |
| Fires in to BC (duration) | | DD:HH:MM | 00:12:25 | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |
| Emissions below limit from BC (end date) | | | not > limit | not > limit | | | | |
| Emissions below limit from BC (duration) | | DD:HH:MM | n/a | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |

| South Stack | Event 1 | | Event 2 | | Event 3 | | Event 4 | |
|--|-----------------------|-----------------------|-------------|-------------|-------------|-------------|---------------|---------------|
| Unit No. | Unit 6 | | Unit 6 | | Unit 6 | | Unit 7 | |
| Breaker Open (BO) | 12:35 am | 2024/07/07 | 4:35 am | 2024/07/16 | 10:35 pm | 2024/07/26 | BO previously | BO previously |
| Draught Group (DG) Shut Down (SD) | DG did not trip or SD | DG did not trip or SD | 11:55 am | 2024/07/17 | 10:55 pm | 2024/07/26 | n/a | n/a |
| BO to DG SD (duration) | n/a | DD:HH:MM | 01:07:20 | DD:HH:MM | 00:00:20 | DD:HH:MM | n/a | DD:HH:MM |
| Fires in time | | | 2024/07/19 | 2024/07/19 | 28:16:15 | 2024/07/28 | | |
| Synch. to Grid (or BC) | | | 2:10 pm | 2024/07/19 | 11:40 pm | 2024/07/28 | | |
| Fires in to BC (duration) | | DD:HH:MM | 00:06:55 | DD:HH:MM | 00:07:25 | DD:HH:MM | | DD:HH:MM |
| Emissions below limit from BC (end date) | | | not > limit | not > limit | not > limit | not > limit | | |
| Emissions below limit from BC (duration) | | DD:HH:MM | n/a | DD:HH:MM | n/a | DD:HH:MM | | DD:HH:MM |


| South Stack ...Continued | Event 1 | | Event 2 | | Event 3 | | Event 4 | |
|--|-------------|-------------|-------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Unit No. | Unit 7 | | Unit 7 | | Unit 10 | | Unit 10 | |
| Breaker Open (BO) | 10:45 pm | 2024/07/03 | 11:05 pm | 2024/07/24 | 10:05 am | 2024/07/11 | 1:05 pm | 2024/07/22 |
| Draught Group (DG) Shut Down (SD) | 8:35 pm | 2024/07/04 | 11:35 pm | 2024/07/24 | DG did not trip or SD | DG did not trip or SD | DG did not trip or SD | DG did not trip or SD |
| BO to DG SD (duration) | 00:21:50 | DD:HH:MM | 00:00:30 | DD:HH:MM | n/a | DD:HH:MM | n/a | DD:HH:MM |
| Fires in time | 5:15 am | 2024/07/06 | 2024/07/25 | 2024/07/25 | | | | |
| Synch. to Grid (or BC) | 5:20 pm | 2024/07/06 | 5:40 am | 2024/07/25 | | | | |
| Fires in to BC (duration) | 00:12:05 | DD:HH:MM | 00:04:45 | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |
| Emissions below limit from BC (end date) | not > limit | not > limit | not > limit | not > limit | | | | |
| Emissions below limit from BC (duration) | n/a | DD:HH:MM | n/a | DD:HH:MM | | DD:HH:MM | | DD:HH:MM |

8 Complaints register:

| Source Code / Name | Root Cause Analysis | Calculation of Impacts / emissions associated with the incident | Dispersion modeling of pollutants where applicable | Date measure will be implemented | Measures implemented to prevent reoccurrence |
|--|------------------------|---|---|-------------------------------------|---|
| The Station did not receive complaints related to air quality during the month of July 2024. | | | | | |

11 General

The station has taken to execute short term and long term mitigations to ensure reliability of the CEMS. The short term actions include interim repairs and replacement of damaged components, which are now complete, by the Original Equipment Manufacturer.
For the long term, the station will engage the Licencing Authority regarding a complete overhaul of the CEMS as required by Paragraph b) of General Condition 4.1 of the AEL.

 26 August 2024
 Compiled: Environmental Officer Date
 A. Boja

 30/08/2024
 Authorised by: GM Date
 T. Lekalakala

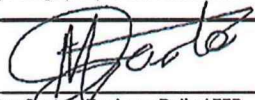
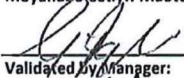
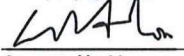
Compiled by: Boiler Engineering Department

For: Nkangala District Municipality

Copies: Eskom Environmental Management

Group Technology Engineering

Hendrina Power Station:

 2024/08/28
 Checked by: System Engineer Boiler/ FFP Date
 Moyahabo, Cetlyiff Maoto
 2024/08/29
 Validated by Manager: Boiler Engineering Date
 G. Kgathle
 2024/08/29
 Supported by Manager: Environmental Date
 L. Ntla

FFP SE/ Environmental Officer

Air Quality Officer

D Herbst
 B Mccourt

R Rampiar
 E. Patel

Engineering Manager
 Operating Manager
 Maintenance Manager
 Unit Production Manager
 Boiler Engineering Manager
 System Engineer: Boiler Engineering
 Environmental Officer
 C & I Engineering Manager
 Production Manager
 Environmental Manager
 PSM