

Eskom Media Brief

André de Ruyter

22 January 2023



1. System Status

2. Generation Recovery Plan

3. Kusile 1,2,3 Duct Failure

Generation Snapshot

22 January 2023 | 08:00



Loadshedding

Stage 2 Loadshedding scheduled



Capacity available

Including open cycle gas turbines

27 519 MW



Units at risk

Currently operating with units at risk due to a need for maintenance

6 850 MW



Planned outages :

6 022 MW



Unplanned outages, partial load losses and outage delays

14 372 MW

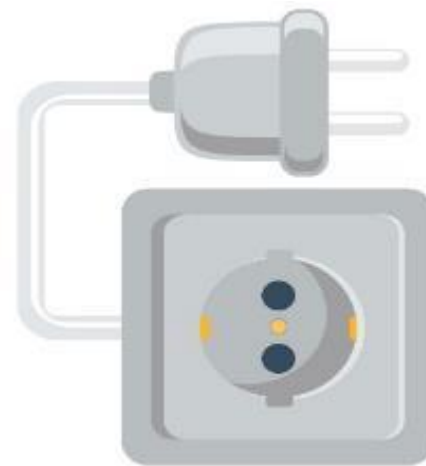
Three (3) Eskom OCGTs/GT's and zero (0) IPP OCGTs were utilised last night for peak. Zero (0) Eskom OCGTs/GT's and zero (0) IPP OCGTs are currently on load. There is a high probability of OCGTs being utilised this evening.

Please note that units at power stations can lose capacity at short notice, impacting the energy available for the day. Depending on the electricity demand, this could necessitate the use of Generation's emergency reserves i.e. pumped storage schemes and OCGTs; thereafter as a last resort, Eskom implements loadshedding to recover the emergency reserves.




Forecast for evening peak (18:00)

26 064 MW



Current plant status and forward view

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- ❑ Experiencing very high levels of plant unreliability and forced outage currently. This is compounded with high planned maintenance.
 - ❑ A number of large generating units are off for extended period contributing to the higher plant unavailability and loss of generating capacity: Medupi 4, Kusile1,2,3, Koeberg 1 planned outage, Kusile 5 delayed commissioning.
 - ❑ Total unplanned (UCLF/OCLF) at **14372 MW** which is significantly higher than the planning basis of **13 000 MW**. Planned maintenance (PCLF) at **6022 MW**.
 - ❑ Currently **Loadshedding stage 2** is implemented and it is planned to change to stage 3 at 16:00 this afternoon up until 5:00 tomorrow morning when we plan to revert to stage 2 Stage 2.
 - ❑ **Four generating units (1680 MW)** are planned to **return to service today and tomorrow** with a further two planned for later the week.
 - ❑ **Planning to reduce stages of loadshedding later this week** although very much dependable on units retuning to service and not incurring further losses.
 - ❑ Due to the inherent unreliability that we are experiencing on the coal fleet, there is a **strong likelihood** that **loadshedding will continue** and that stages can change on short notice on the loss of further generating capacity.
 - ❑ Three (3) Eskom **OCGTs/GT's** and zero (0) IPP OCGTs were **utilised last night** for peak. Zero (0) Eskom OCGTs/GT's and zero (0) IPP OCGTs are currently on load. There is a low probability of OCGTs being utilised this evening.
 - ❑ Dam and diesel levels will be closely managed, within the current diesel constraints.
 - ❑ We are expecting **900 MW** of vacuum load losses for Matimba today and approximately **700 – 800 MW** over the next three days.
 - ❑ **Outage slips have reduced but** remain a core focus area as they contribute to the unplanned capacity loss (**956 MW** currently on slip).

Summary

Maintenance outlook

System Health

Issue / Risk status

1. Peak Hour Outlook

Date	Time	Peak (MW)	Reserve margin* (MW)	Reserve Margin (%)
22 January 2023	19:00 – 20:00	26 064	-2831.3	-10.72%

2. Capacity Outlook for Evening Peak

Shortage of Meeting Demand	-3134.3	2000-4000MW short of meeting demand and reserves.
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3. Current System Trend

System trend forecast and performance at 08:00

Actual Sent Out (A)	22441
Load Forecast (F)	24218
Variance (A-F)	-1777

Colour Legend:

Adequate generation to meet demand and reserves
0 – 1000 MW short of meeting demand and reserves
1000 – 2000 MW short of meeting demand and reserves
2000 – 4000 MW short of meeting demand and reserves
>4000 MW short of meeting demand and reserves

4. Next 6 Hours Outlook

Next Hour Start	Planned Maintenance	UCLF Full Losses	UCLF Partial Losses	UCLF Total (Full + Partial)	OCLF Total (Full + Partial)	MW Expected to return	Operational MW	Generation Constraints	Capacity Available	Capacity Available Excl Gas	Load Forecasts	Demand and Reserves Shortfall	Demand and Reserves Shortfall (Excl OCGT)
Current	6022	8180	5472	13652	820	0	48013	0	27519	25167	24218	1101	1251
09:00	6022	8180	5472	13652	820	0	48013	0	27519	25167	24453	866	1486
10:00	6022	8180	5472	13652	820	0	48013	0	27519	25167	24154	1165	1187
11:00	6022	8180	5472	13652	820	0	48013	0	27519	25167	23834	1485	867
12:00	6022	8180	5472	13652	820	0	48013	0	27519	25167	23786	1533	819
13:00	6022	8180	5472	13652	820	0	48013	0	27519	25167	23539	1780	572
14:00	6022	8180	5472	13652	820	0	48013	0	27519	25167	23183	2136	216

Surplus of Energy Including 2200 Reserve

Units running with risk



Units at risk on Sunday, 22 January 2023

Unit	MW	Current PLL	Additional MW at risk	Reason	Planned Outage	Expected RTS
Arnot 05	350	0	350	CEP A breaker fault (tripped)	TBC	
Grootvlei 02	190	84	106	Boiler tube leak	26/01/2023	30/01/2023
Grootvlei 03	190	55	135	High Demin water consumption	21/01/2023	23/01/2023
Hendrina 10	190	86	104	High vacuum	TBC	
Kendal 01	640	154	486	PA fan motor high Amps	TBC	
Kendal 02	640	83	557	ID Fan balance weight	TBC	
Koeberg 02	930	10	920	Cycling of reactor rods	TBC	
Kriel 06	475	200	275	Boiler tube leak	26/01/2023	29/01/2023
Kusile 04	720	0	720	Gas Air Heater defective	TBC	
Lethabo 02	593	168	425	Gen H2 leak	03/02/2023	22/02/2023
Majuba 01	606	199	407	Boiler hopper tube leak	TBC	
Majuba 02	606	110	496	Boiler hopper tube leak	TBC	
Medupi 03	720	197	523	Boiler tubes below min thickness / AH motor failure / high emissions	TBC	
Total	6 850	1 346	5 504			

Note:

- Units highlighted in red are high-risk units (i.e., possible full capacity load loss)

Total Station Risks:

- **Medupi** – Monostat failure risk and HP pipe-work failure due to material specs
- **Camden & Kriel** – Coal constraints; high spec coal risk in preparation for rainy season
- **Lethabo** – Coal supply constraints
- **Majuba** – Milling plant availability
- **Matla** – Coal quality

Projected Loadshedding Outlook

Date	MP OCGTs	EP OCGTs	MP LS	EP LS	MP Reserves	EP Reserves
Saturday 21 Jan	0	0	3	4	2270	1823
Sunday 22 Jan	0	0	2	3	2084	1251
Monday 23 Jan	0	2	2	4	1486	1067
Tuesday 24 Jan	0	0	1	3	1569	1125
Wednesday 25 Jan	0	0	1	3	1781	1186
Thursday 26 Jan	0	0	1	3	1774	1516
Friday 27 Jan	4	0	1	3	1104	1518

Units planned to RTS – Next four days



Planned RTS for Monday, 23 January 2023					
	UCLF	PCLF	Reason	Expected RTS	Comments
Kriel 03	405		Boiler tube leak repairs	Monday evening peak	
Matla 04		575	Planned outage	Monday evening peak	TBC
Total	405	575			
Planned RTS for Tuesday, 24 January 2023					
Majuba 04	663		Boiler tube leak repairs	Tuesday evening peak	TBC
Total	663				
Planned RTS for Wednesday, 25 January 2023					
None					
Total	0				
Planned RTS for Thursday, 26 January 2023					
Duvha 05		575	Planned outage	Thursday morning peak	
Total		575			

Note: The system is dynamic and RTS subject to change
 UCLF will be impacted by unit trips, full load losses (boiler tube leaks) and partial load losses



Diesel levels at OCGT stations

Diesel levels for OCGTs		
Power station	Diesel volumes in tanks (%)	Generation hours
Ankerlig	94	304
Gourikwa	65	131
Acacia	90	28
Port Rex	80	42



Water levels at pumped storage stations

Pumped storage levels @ 08:00		
Power station	Pumping hours	Generating hours
Drakensberg	57	72
Ingula	16	45
Palmiet	28	35

Power Station	19 Jan		20 Jan	Off site storage	Ad hoc storage
	Plan	Act	Plan	@ 08:00	
Ankerlig (Tankers / %)	20,0 (4,7%)	23,0 (5,3%)	30,0 (7,0%)	2,1 ML	11,1 ML
Gourikwa (Mil liters)	2,0 (17,6%)	1,0 (8,8%)	2,0 (17,6%)	10,3 ML	NA

Note: Dam and diesel levels will continue to be closely managed, particularly within the current diesel constraints.

OCGT utilization	Eskom	IPP	Key performance indicator	Megawatts
Evening Peak (last night)	03	00	Total unplanned (UCLF/OCLF)	14 372
Morning Peak (today)	00	00	Planned Maintenance	6 022
Probability of OCGT usage this evening	High		Partial load losses	6 135

Loadshedding status



- Loadshedding stage 2 implemented until 16:00.
- Loadshedding stage 3 scheduled from 16:00 until 05:00 on 23/01.

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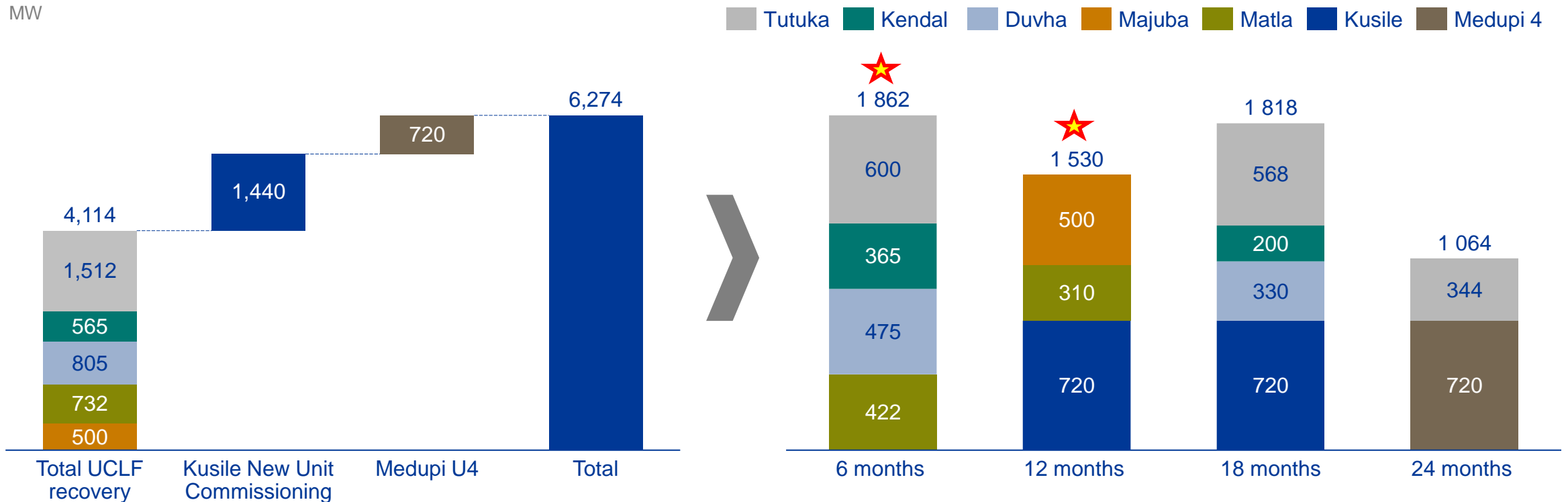
- ❑ The performance of the Generation fleet is unacceptable with EAF less than 60%
- ❑ Eskom has regrouped efforts to focus areas and levers to improve **people, plant and process** performance – these are **essential levers** for a **sustainable** improvement
- ❑ Incidents such as Medupi 4, Kusile 1-3 FGD challenges, Kusile 5 air heater fire and Koeberg extended outage mean over 4500MW will be offline for an extended period
- ❑ Generation's operational recovery plan is geared towards improving EAF from the current 58% to 65% by the end of FY24 and 70% by the end of FY25
- ❑ Target is to recover **1 862 MW in FY23** and **~6 000 MW in the next 24** months with an intensified effort at Top 6 stations. Each station has detailed recovery plans – tracking of related actions is being implemented and will be automated
- ❑ To enable this plan, additional funding will be required for outage execution and operations.
- ❑ A number of demand side management initiative also used.

Generation's Operational Recovery Plan is Geared towards Improving EAF from 58% to at least 70% from the end of FY25 onwards



By recovering capacity, commissioning New Build, ~6 000 MW can be delivered by Generation in the next 24 months

Capacity that can be recovered by Eskom generation over 24 months



• Numbers are based on UCLF reduction committed, given the current YTD performance levels, and resultant availability factoring in planned maintenance.

★ Kusile 1, 2, 3 failed after plan was developed. The plan with timelines has been developed to address the Kusile U1 duct failure and consequent damage to Unit 2 and 3 and will offset the potential gains until the units are fully recovered. We can expect the 3 units towards the end of the year.

• Medupi to return unit 4 from long term forced Outage by 31 August 2024

Eskom has regrouped efforts to focus areas to improve people, plant and process performance – essential for turnaround

10 Focus areas	What we are doing
Plant Condition	Increased maintenance within limitations. Establish production room, accelerated spares sourcing. Establish long term contracts.
Inadequate Capacity	Defer maintenance. Engaged to expedite IPPs, Risk Mitigation, etc. Planned repowering of stations shutting.
Skills & Experience	Stability in GE & PSGMS. Appointing Plant Managers. Engaging experienced external experts. Ramping up training and development. Skills/competency audit. Culture of accountability & consequence management. Incentivise & reward staff. Crowdsourcing, Project management,
Fraud & Corruption	Eskom has increased governance controls and performs trending analyses on volumes and prices. Investment in technology, Qs, training.
Policies & Procedures	Engaged government (DPE, NT) for relaxation of some requirements.
Funding	Aggressive cost cutting. Making funds available for outage and midlife refurb
Environmental Compliance	Proposed an emission reduction plan that is achievable. Appealed DFFE decision.
Coal	Engaging mines re quality & quantity. Renegotiating agreements. Investing in cost-plus mines. Increasing verification and monitoring.
New Build Defects	Solutions for some areas developed and tested on Medupi 3. Rolled out to other units. Additional solutions to be rolled out to achieve desired performance.
Eskom Rotek Industries	OEM engineering support and oversight on turbine centreline. Improved Quality Assurance process. De-scoping ERI contracts and approach OEMs on specific plant areas, e.g., Kusile FGD

Successes made thus far

1. National Treasury has relaxed some requirements which will speed up procurement
2. The allocation of Outage budgeting has improved, seeing signs of improved Outage Readiness
3. Receiving a lot of collaboration among external stakeholders with a willingness to assist Eskom
4. On the 9 Point plan we have seen success in the following areas:
 - I. The new build defect repair. Medupi performance is improving
 - II. Achieving coal stock days and rain readiness program in place

Additional focus to prioritise maintenance at the **Top Six Stations**; Duvha, Kendal, Kusile, Majuba, Matla & Tutuka,

These stations were specifically selected as they are amongst the highest contributors to unplanned load losses. **Any improvement in these stations will result in massive gains in EAF** for Generation as a whole

- Generation remains aware that the current performance is unacceptable and impacting on the people and economy of South Africa
- Generation is working with urgency to improve plant performance and EAF.
- Eskom is committed to improve plant performance but in order to stop load shedding, additional new generating capacity is urgently required.
- The recovery plan aims to gain ~6 000 MW in the 24 months
- The success of the Recovery plan is highly dependent on both internal and external factors
 - Internal factors are being addressed by focusing on operational excellence which encompasses Plant Condition, Inadequate Capacity, Skills & Experience, Fraud & Corruption, Policies & Procedures, Funding, Environmental Compliance, Coal, New Build Defects, Eskom Rotek Industries
 - Without the external factors being resolved, sustainable performance improvement is not possible

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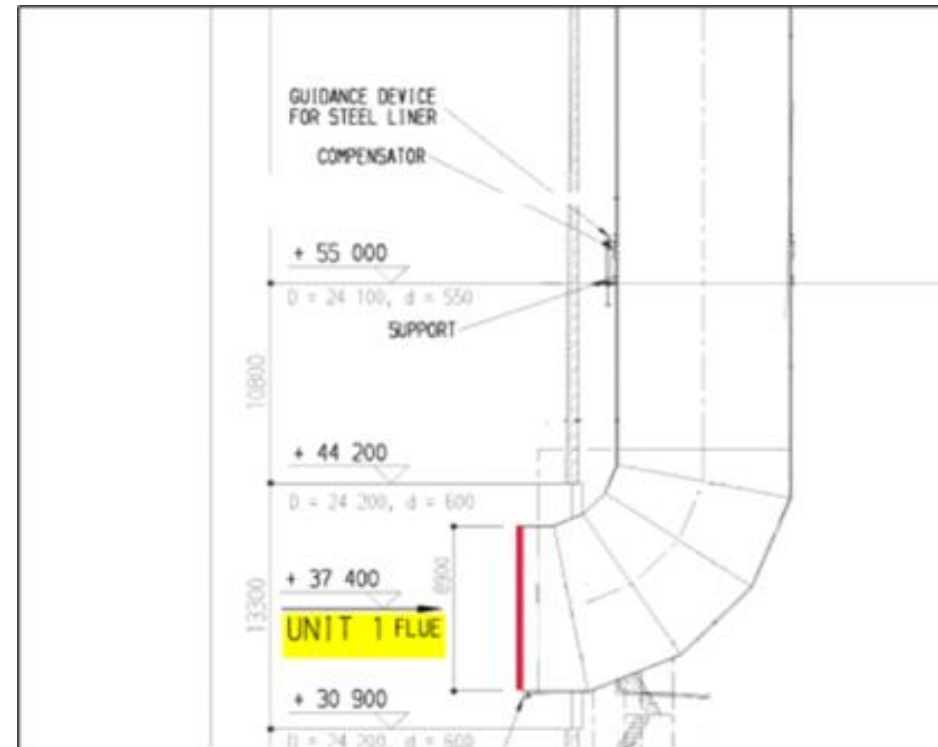
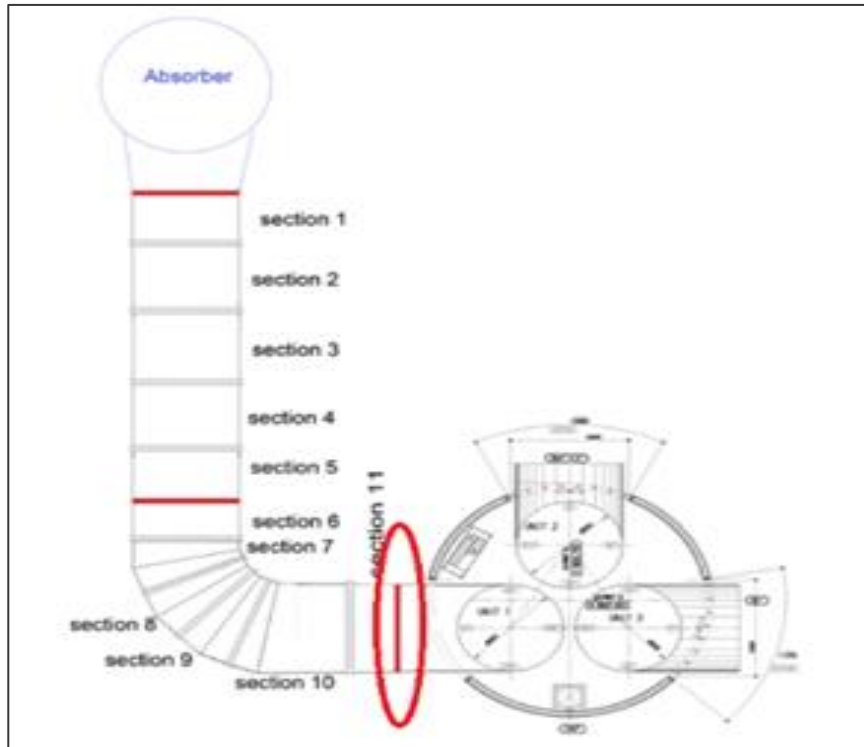
Kusile 1, 2, 3 Flue duct failure



- ❑ Kusile unit 1 flue duct failed on 23 October 2022 when the duct bend where it enters the common unit 1, 2, 3 chimney collapsed.
- ❑ The bend collapsed as a result of excessive weight imposed on the common support platform structure resulting in its failure.
- ❑ This compromised the adjacent Unit 2 and 3 flue duct bends making all three units inoperable.
- ❑ A total of 2160MW unavailable as a result of Kusile 1, 2 and 3 not available.
- ❑ Further investigation in conjunction with the OEM has revealed that there is excessive ash slurry build up in all three units' flues adding a lot of weight which compromises the integrity of the flues and the chimney.
- ❑ Temporary flues for units 1, 2 and 3 will be constructed to return the units to service while repairing the common chimney.
- ❑ It is anticipated that the design construction of the temporary stack will take between 8 and 12 months.
- ❑ Exemption will be sought from DEFF to temporary operate the units while bypassing the FGD's with the temporary stacks.

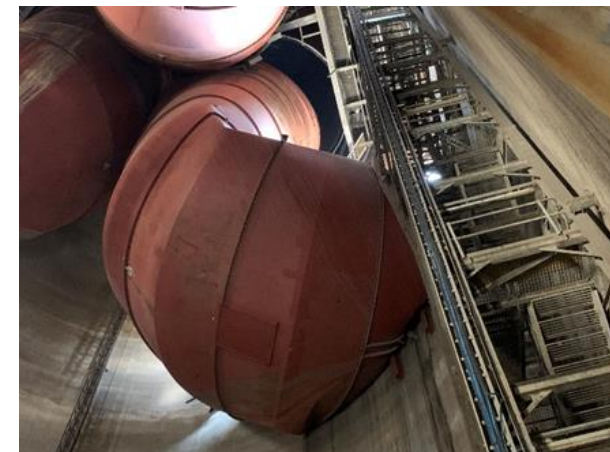
Introduction

- Kusile chimneys are multi-flue (steel stack), each of the two chimneys are housed inside a reinforced concrete windshield serving three boilers, as shown on the diagram below.
- For each unit, the gas flue begins at the absorber 45m above ground (approx. 50m long) to enter the concrete reinforced windshield and release the gases at a height of 220m.

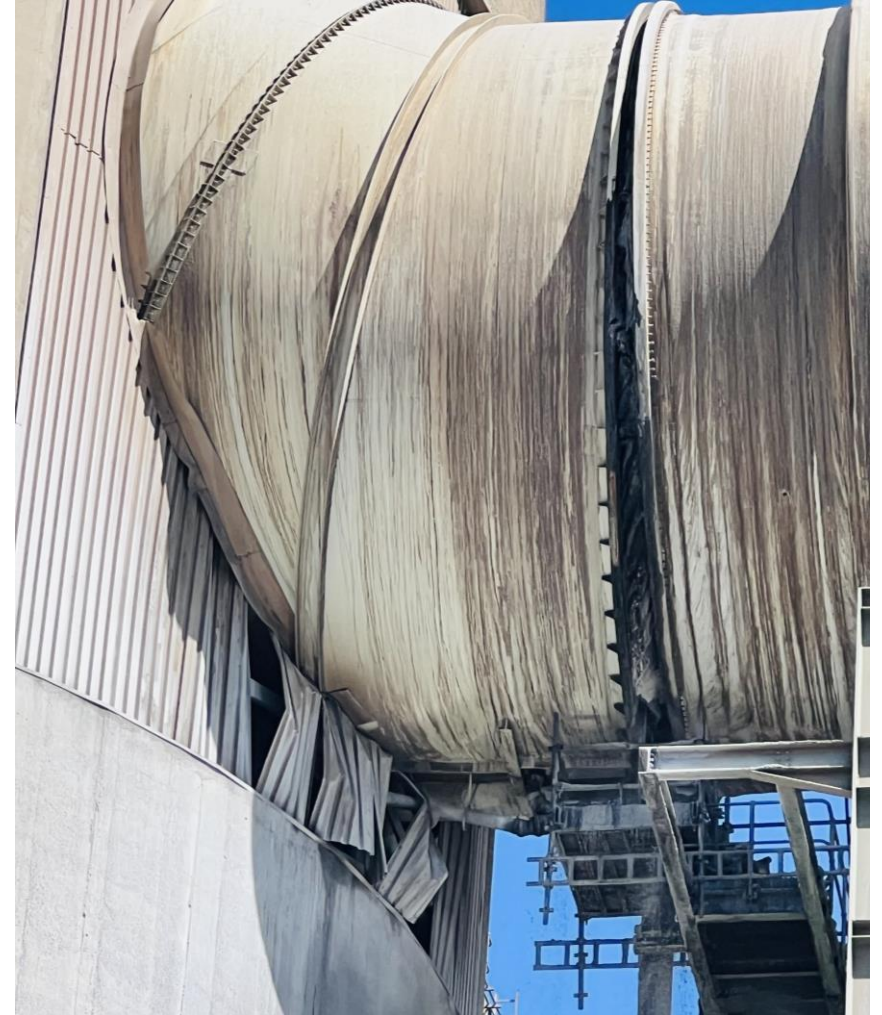


Background

- At approximately 09:45AM on Sunday the 23rd October 2022 while Kusile unit 1 was on a forced outage, the flue duct experienced a structural failure on the horizontal rubber expansion joint, as well as on the rubber expansion joint at the 55m level.



Kusile 2 and 3 Flues



Supporting platform failure and unit 1 bend dislodged from vertical flue



Unit 1 bend collapse



Unit 1 damage and resting against unit 2 and 3 bends

