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Document Type	Inspection Report
Outage ID	24393
Scope of Activity	GT22 Minor Inspection at Gourikwa Peaking OCGT
Purpose	This is a technical report on the “as found” condition, remedial action performed and final condition of plant or components.

Compiled		
Name/Designation	Signature	Date
L Calana Gas Turbine System Engineer		2023/01/30
J Otto Design Engineer		2023/01/30

Functional Responsibility		
Name/Designation	Signature	Date
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Revision Details		
Date	Revision	Area


Accepted		
Name/Designation	Signature	Date
P Mrubata Plant Manager OCGT		2023/02/01

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SUMMARY

Gourikwa GT22 was removed from service on 10 October 2022 at 06:00 in order to carry out Minor Inspection activities as identified in 240-136723367. Limited disassembly, intervention and reassembly activities were performed by site maintenance personnel, and inspections were performed internally by Eskom and ERI personnel, and were carried out from 2022/10/11 until 2022/10/14. Areas inspected included: Filter house, Compressor Inlet, Compressor Exhaust, Combustion Chambers, Turbine Inlet and the Turbine Exhaust.

LIST OF ABBREVIATIONS


BU	Business Unit
BIR	Burner Insert Ring
CC	Combustion Chamber
C&I	Control & Instrumentation
CS	Compressor Side
CV	Control Valve
DOH	Dynamic Hours
EOH	Equivalent Operating Hours
ERI	Eskom Rotek Industries
FT	Flame Tube
IC	Inner Casing
LE	Leading Edge
LHS	Open Cycle Gas Turbine
MC	Mixing Chamber
MI	Minor Inspection
MO	Major Inspection
OCGT	Right Hand Side
RHS	Right Hand Side
TBC	Thermal Barrier Coating
TE	Trailing Edge
TLa1	Turbine 1 st Stage Blades
TLa4	Turbine 4 th Stage Blades
TLe1	Turbine 1 st Stage Vanes
TLa4	Turbine 4 th Stage Blades
TLe4	Turbine 4 th Stage Vanes
TS	Turbine Side
TOT	Turbine Outlet Temperature
VIGV	Variable Inlet Guide Vane
VLa1	Compressor 1 st Stage Blades
VLe0	Compressor 0 th Stage Vanes (VIGVs)

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UNIT INFORMATION

Date	Starts	Operating Hours	EOH	DOH
2022/10/10	2227	14720	37869	716
Turbine Serial	Turbine Frame	Fuel(s)	Generator Serial	Generator Frame
800621	SGT5-2000E(6)	Fuel Oil	12008578	SGEN5-100A-2P 115/36

REFERENCES

1. Normative
 - a. Gas Turbine Minor Inspection Checklist: 3.5-0236-9420
 - b. Siemens SGTS-2000E Minor Inspection Philosophy: 240-136723367
2. Informative
 - c. Operating & Maintenance Manual – Gas Turbine Description
 - d. Intervals for Maintenance Work: 3.5-0022-9426

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1 EXECUTIVE SUMMARY OF FINDINGS

Section	Findings	Corrective Measures
2.1	Turbine and generator hall structure significantly corroded	Corrosion maintenance plan to be addressed
3.1	Filter house corrosion noted.	Corrosion maintenance plan to be addressed
5.1.3, 5.2.3	Overlap wear found between mixing casing cooling ring and inner casing on both combustion chambers	No action – monitor at next MI
5.1.3, 5.2.3	Overlap wear noticed between flame tube and mixing casing castellation in both combustion chambers	No action – monitor at next MI
5.1.2.2, 5.2.2.2	Several premix nozzles were found to be blocked.	Blockages cleared by site.
5.1.2.4, 5.2.2.4	Cracking of several burner insert rings noted	No action – monitor at next MI
6.1	Crack in TBC of Turbine 1 st stage vanes #2 and #21 noted	No action – monitor at next MI
6.1	Flaking of TBC noted on several 1 st stage blades	No action – monitor at next MI
6.1	Significant flaking of TBC on Turbine 1 st stage vane #14 noted	No action – monitor at next MI
7	Numerous cracks noted downstream of the turbine outlet; internal cladding and expansion joint cover plates	Plate replacement and weld repairs executed.

2 EXTERNAL INSPECTIONS

2.1 General

Finding(s):

1. Turbine & Generator hall structure has severe corrosion noted.
2. General corrosion of cladding.

Corrective Measure(s):

1. Corrosion assessment to be performed.
2. No remedial action required – to be monitored during the next MI.

2.2 Ignition Gas

No anomalies noted.

2.3 Control Oil Skid

Finding(s):

1. Slight dirt on skid.


Corrective Measure(s):

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1. Site to clean skid.

2.4 Fuel Oil Skid

Finding(s):

1. Dirt noted on skid.
2. Leakage noted on fuel supply pump seals.
3. Tag 22MBN13AA219 loose.

Corrective Measure(s):

1. Site to clean skid .
2. Site to clean and report any leakages.
3. Site to correctly affix tag.

2.5 Lubricating Oil and Jacking Oil Skid

Finding(s):

1. Oil leakage below filter block.
2. Oil seepage noted from the cooler inlet.
3. Compressor jacking oil pipe in air intake cone does not have supports.
4. Seepage from valve 22MBV21AA301 noted.

Corrective Measure(s):

1. Site to clean skid and report leaks if noted.
2. Site to clean skid and report leaks if noted.
3. Site to ensure pipework is supported in order to prevent fretting¹.
4. Site to schedule intervention at the next available opportunity.

2.6 Turbine

Finding(s):

1. CC drain line pipes overheated and discoloured.
2. White residue on cladding.


Corrective Measure(s):

1. Similar damage was noted as historic at Ankerlig and recorded in Technical Notification ANK-41-BA-2017-MJ-001. The pipes should be internally inspected, cleaned and re-painted during the next MI.
2. White residue on cladding was likely caused by water from the leaking roof.

2.7 Combustion Chambers

Finding(s):

¹ This is a repeat finding

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1. White residue on outside cladding.
2. General corrosion and flaking of paint noted on all burners, especially on the RHS.
3. Roof overhead corroding severely – with possible rain leaks onto the CCs.
4. Seepage from premix bellow of burner 1-2 noted.
5. DO supply line is missing a bracket near the top of CC1, and CC2 DO supply line is also missing a bracket.
6. ΔP pipe support inadequate.
7. Tag 22MBM22CT109 damaged.

Corrective Measure(s):

1. White residue on cladding was caused by water from the leaking roof.
2. No remedial action required – to be monitored during the next MI.
3. Site to schedule intervention during the next MO.
4. To be monitored during the next MI.
5. Site to ensure that pipework is adequately supported in order to prevent vibration related damages.
6. Site to rectify.
7. Site to replace tag.

2.8 Generator

Finding(s):

1. Old oil on floor noted by TE and EE bearings.
2. Walkway near RHS unstable.

Corrective Measure(s):

1. No action required.
2. Site to ensure floor grid is correctly supported.

3 AIR INTAKE SYSTEM

3.1 Filter House

Finding(s):

1. Light cabling hanging loose.
2. Coalescing filters filthy and out of position.
3. Pre-filters filthy.
4. Cobwebs in filter-house walk-area.
5. Clean room extremely wet.
6. 7 off filters in clean room damaged.
7. Top LHS door could not be unlocked.

Corrective Measure(s):


1. Site to ensure electrical cabling does not pose a risk to maintenance activities.

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2. Coalescing filters replaced by site.
3. Some pre-filters replaced by site. Site to plan so that all filters can be replaced during a MI if necessary.
4. Indicative of site not performing regular inspections. OPS to review plant walk-down schedule and ensure that necessary routine checks are executed.
5. Indicative of leaks – site to investigate and plan for refurbishment.
6. Filters replaced.
7. Site to replace lock, and ensure that a single key can still be used to access all areas of the clean room.

3.2 Compressor Inlet

Finding(s):

1. Compressor air inlet gasket incomplete.
2. Inlet area appears heavily corroded.
3. Bubbling of paint noted.

Corrective Measure(s):

1. Site to plan to replace/ complete the gasket².
2. Site to schedule corrosion intervention.
3. Site to ensure that solvent is rinsed properly after performing compressor wash.

4 COMPRESSOR

4.1 Inlet

4.2.1 VLe0

Finding(s):

1. VIGVs quite filthy with dust debris.
2. Coating abrasion noted at leading edges of the aerofoils.

Corrective Measure(s):

1. Perform compressor washing.
2. No remedial action required – to be monitored during the next MI.

4.2.2 VLa1

Finding(s):


1. Deposits noted on blade aerofoils on suction and pressure sides.
2. Coating abrasion noted on leading edges of the aerofoils.

Corrective Measure(s):

1. Perform compressor washing.

² Gaps were marked during the previous MI, no deterioration noted.

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2. No remedial action required – to be monitored during the next MI.

4.2 Exhaust Diffusor

Finding(s):

1. Wear noted on CC2 MC CS.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI.

5 COMBUSTION

5.1 LHS CC

5.1.1 Sight Glasses

Finding(s):

1. Manhole sight glass dirty.

Corrective Measure(s):

1. Sight glass removed, cleaned and re-installed.

5.1.2 Flame Tube

Finding(s):

1. Overheating of tile support ring in several areas.
2. Overheating of dome plate support ring in some areas.
3. Some cracks noted in dome plate support ring.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI.
3. No remedial action required – to be monitored during the next MI.

5.1.2.1 Diffusion Burners

Finding(s):

1. Coking noted on all burner caps and several axial swirlers.

Corrective Measure(s):

1. Coking cleaned during MI.

5.1.2.2 Premix Burners

Finding(s):


1. Light coking noted on all burner assemblies.
2. Several overheated diagonal swirlers on all burners; this is likely indicative of flashbacks having occurred.
3. Unequal deposits on several diagonal swirler outlet cones.

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4. Plugged holes noted on burners 1-2 (5), 1-3 (6), 1-4 (1), 1-5 (2) and 1-7 (1).
5. Cracks noted on the premix outer bell of burner 1-6.
6. Burner alignment 1-4 slightly above specification.

Corrective Measure(s):

1. Coking cleaned during MI.
2. Procurement of adequate quality fuel to be ensured.
3. No remedial action required – to be monitored during the next MI.
4. Plugged holes drilled clean by site. The large quantity of plugged holes may be indicative of supply oil imbalance, to be monitored during the next MI, and investigated if similar findings are made.
5. To be monitored during the next MI.
6. No remedial action required – to be monitored during the next MI.

5.1.2.3 Ceramic Heat Shields

Finding(s)³:

1. No tiles were found with defects outside of the tolerable limits.

5.1.2.4 Dome Plates & Burner Inserts

Finding(s):

1. Minor signs of fretting noted between dome plates and burner inserts.
2. Cracks noted on burner insert ring(s) on 1-3, 1-4, 1-5, 1-6⁴ and 1-8.
3. Slight deformation noted on plates 1-1, 1-3 and 1-6.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI. Site to consider application for reverse-engineering of Burner Insert Rings to alleviate replacement costs for the next MO.
3. No remedial actions required – to be monitored during the next MI.


5.1.3 Mixing Chamber

Finding(s):

1. Hammering noted between Flame Tube and Mixing Chamber {at castellations 5, 6-7, 8-11, 12-13, 13-14, 15-16, 16-17, 18-19, 20-21, 21-22, 23, 24, 26-29, 30}.
2. Hammering noted between Mixing Chamber and Inner Casing {at IC castellations 1-7, 9-13, 14-20}.
3. Slight rubbing of manhole insert at collar noted.
4. Corrosion noted on CW2, and TE bushing support.
5. Clearance “B” between Mixing Chamber and Inner Casing below specification.

³ Tolerable limits as defined in: 37-1345-52KE00-DE-2013-12-003|004|005|006|007

⁴ The cracks on 1-6 are significantly worse than those noted on the other BIRs.

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6. Average “t” between Flame Tube and Mixing Chamber is below specification.
7. Average “s” between Flame Tube and Mixing Chamber is above specification.
8. Crack noted at CS inspection port.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI.
3. No remedial action required – to be monitored during the next MI.
4. No remedial action required – to be monitored during the next MI.
5. No remedial action required – to be monitored during the next MI⁵.
6. No remedial action required – to be monitored during the next MI⁶.
7. No remedial action required – to be monitored during the next MI⁷.
8. No remedial action required – to be monitored during the next MI.

5.2 RHS CC

5.2.1 Sight Glasses

Finding(s):

1. 1 off damaged sight glass in flame tube.
2. Manhole sight glass dirty.

Corrective Measure(s):

1. Sight glasses replaced.
2. Sight glass removed, cleaned and re-installed.

5.2.2 Flame Tube

Finding(s):

1. Overheating of tile support ring in several areas.
2. Overheating of dome plate support ring in some areas.
3. Some cracks noted in dome plate support ring.

Corrective Measure(s):


1. No remedial action required – to be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI.
3. No remedial action required – to be monitored during the next MI.

5.2.2.1 Diffusion Burners

⁵ Values are similar when compared to data from previous MI.

⁶ Deviation was also noted during the previous MI.

⁷ Deviation was also noted during the previous MI..

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Finding(s):

1. Coking noted on all burner caps and several axial swirlers.

Corrective Measure(s):

1. Coking cleaned during MI.

5.2.2.2 Premix Burners

Finding(s):

1. Coking noted on all burner assemblies.
2. Several overheated diagonal swirlers on all burners; this is likely indicative of flashbacks having occurred.
3. Unequal deposits on all diagonal swirler outlet cones.
4. Significant overheating on the premix bell of burners 2-2, 2-4 and 2-6 resulting in missing material and cracks. Burner 2-3 is also beginning to show signs of overheating.
5. Plugged holes noted on burner 2-5 (ALL), 2-6 (2), 2-7 (1) and 2-8 (2).

Corrective Measure(s):

1. Coking cleaned during MI.
2. Procurement of adequate quality fuel to be ensured.
3. No remedial action required – to be monitored during the next MI.
4. No remedial action required – to be monitored during the next MI⁸.
5. Plugged holes drilled clean by site. Site to plan to replace the copper spacer of burner 2-5 during the next MI.

5.2.2.3 Ceramic Heat Shields

Finding(s)⁹:

1. No tiles were found with defects outside of the tolerable limits. However several tiles have cracks approaching the tolerable limits.
2. Cold-patch noted in the vicinity of burner 2-5.
3. C-32 missing some material – but did not require replacement. To be monitored during the next MI.

5.2.2.4 Dome Plates & Burner Inserts

Finding(s):


1. Minor signs of fretting noted between dome plates and burner inserts.
2. Cracks noted on burner insert ring 2-2, 2-3, 2-4, 2-6, 2-7 and 2-8.
3. Minor deformation noted on plate 2-5.

Corrective Measure(s):

⁸ The damage to burner 2-6 has been sustained since the last MI.

⁹ Tolerable limits as defined in: 37-1345-52KE00-DE-2013-12-003|004|005|006|007

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1. No remedial action required – to be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI. Site to consider application for reverse-engineering of Burner Insert Rings to alleviate replacement costs for the next MO.
3. No remedial action required – to be monitored during the next MI.

5.2.3 Mixing Chamber

Finding(s):

1. Cracks noted from both inspection ports, CW2, CW3, CS eccentric key and CS guide plate.
2. Hammering noted between Flame Tube and Mixing Chamber {at castellations 9-10, 11, 12, 13 ,14, 15, 16-20 ,26-27
3. Hammering noted between Mixing Chamber and Inner Casing {at IC castellations 7, 8, 9, 10-12, 13-16, 20-6}.
4. Slight rubbing of manhole insert collar noted.
5. Slight historic mechanical damage noted on cooling air ring.
6. Corrosion noted on CW3, CW4, TE support plate and TE bushing support.
7. Clearance “B” between Mixing Chamber and Inner Casing below specification.
8. Clearance “s” between Mixing Chamber and Flame Tube is above specification.

Corrective Measure(s):

1. To be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI.
3. No remedial action required – to be monitored during the next MI.
4. No remedial action required – to be monitored during the next MI.
5. No remedial action required.
6. No remedial action required – to be monitored during the next MI.
7. No remedial action required – to be monitored during the next MI.
8. No remedial action required – to be monitored during the next MI.

5.3 Inner Casing

Finding(s):

1. Spallation of TBC on hub observed.
2. Some corrosion was noted on the IC walls.
3. Some cracks beginning to form.

Corrective Measure(s):


1. To be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI.
3. To be monitored during the next MI.

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6 TURBINE

6.1 Inlet

Finding(s):

1. Normal discoloration of TLe1 and TLa1 TBC observed.
2. Minor flaking of TBC on TLe1 #1, #3, #4, #40, #41 and #46 observed.
3. Significant flaking of TBC on #14 observed.
4. Crack in TBC on TLe1 #2 and #21 observed.
5. LE radial blade tip clearances were measured to be tight at the right and the bottom. Δs Measurements were also quite large.

Corrective Measure(s):

1. No remedial action required.
2. No remedial action required – to be monitored during the next MI.
3. To be monitored during the next MI¹⁰.
4. No remedial action required – to be monitored during the next MI¹¹.
5. No remedial action required – to be monitored during the next MI¹².

6.2 Outlet

Finding(s):

1. Most TE radial blade tip clearances were measured to be tight – however there were no visible signs of rubbing¹³.
2. Standard deposits noted on the 4th stage blades and vanes.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI.
2. No remedial action – to be monitored during the next MI.

7 EXHAUST


Finding(s):

¹⁰ Coloration is indicative that MCrAlY is still present in sufficient quantities to combat oxidation.

¹¹ Both cracks were noted during the previous MI.

¹² Large deviation noted from previous measurements. Possibly due to change in measuring equipment / personnel. To be verified during the next MI. No signs of rubbing were observed.

¹³ Large deviation noted from previous measurements. Possibly due to change in measuring equipment / personnel. To be verified during the next MI. No signs of rubbing were observed

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1. Cracks indications noted in several areas of the exhaust casing, expansion joint plates and turbine bearing hub.
2. Wear noted on turbine bearing hub cover plate, 1st and 2nd expansion joint plates.
3. Exhaust manhole door (from the Turbine Hall) is protruding – this may negatively affect the flow of working fluid in the exhaust.
4. Significant horizontal cracks noted with some areas that have missing material.
5. Exhaust cushion damaged.

Corrective Measure(s):

1. Several cracks were weld-repaired. To be monitored during the next MI.
2. No remedial action required – to be monitored during the next MI.
3. Site to ensure that requisite components are available for amendments to be made during the next MO¹⁴.
4. Plate replacement and weld repairs executed by site.
5. Site to replace.

8 ACKNOWLEDGEMENTS

- Hadley Siebritz operations & maintenance senior supervisor, and his team for assisting with the drilling of the premix nozzle blockages.

¹⁴ This defect was raised in 195/442 to be corrected during this outage. Should performance be impacted this may need to be corrected before the next MO is reached.

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APPENDIX A



Figure 1: Control oil skid

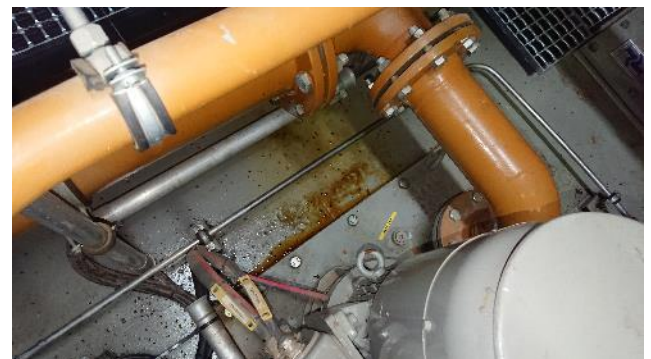


Figure 5: Lubricating oil skid



Figure 2: Lubricating oil skid



Figure 6: Lubricating oil skid



Figure 3: Lubricating oil skid



Figure 7: Lubricating oil skid



Figure 4: Lubricating oil skid



Figure 8: Lubricating oil skid

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Figure 9: Structure



Figure 13: Cladding



Figure 10: Fuel oil skid



Figure 14: Cladding



Figure 11: Fuel oil skid



Figure 15: Cladding

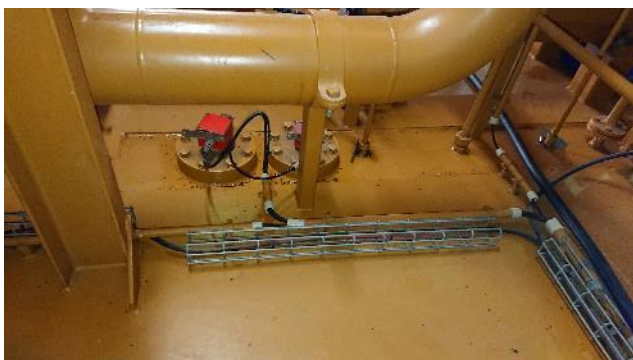


Figure 12: Fuel oil skid



Figure 16: Cladding

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Figure 17: Cladding

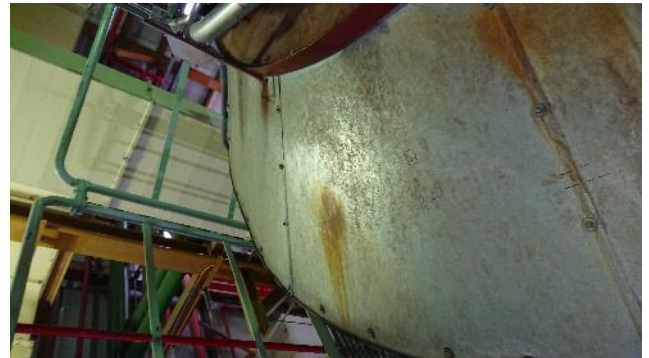


Figure 21: Burners



Figure 18: Burners



Figure 22: Burners



Figure 19: Burners



Figure 23: Burners



Figure 20: Burners



Figure 24: Burners

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Figure 25: Dome cladding



Figure 29: Structure

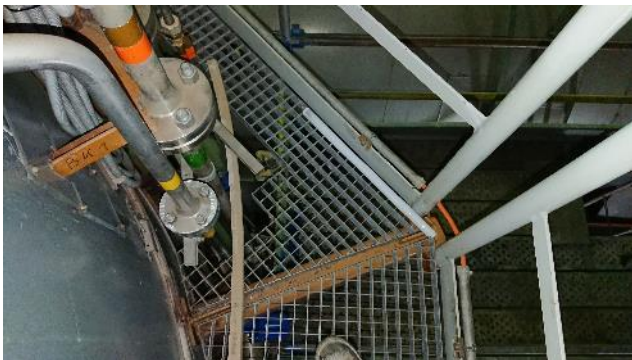


Figure 26: Housekeeping



Figure 30: Cladding



Figure 27: Burners



Figure 31: Compressor inlet cone - housekeeping



Figure 28: Structure



Figure 32: Compressor inlet cone (internal)

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Figure 33: Compressor inlet cone (internal)



Figure 34: Generator TE bearing



Figure 35: Structure



Figure 36: Structure



Figure 37: Structure



Figure 38: Generator EE bearing



Figure 39: Generator EE bearing



Figure 40: Filter house

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Figure 41: Filter house



Figure 45: Pre-filters



Figure 42: Filter house



Figure 46: Filter house

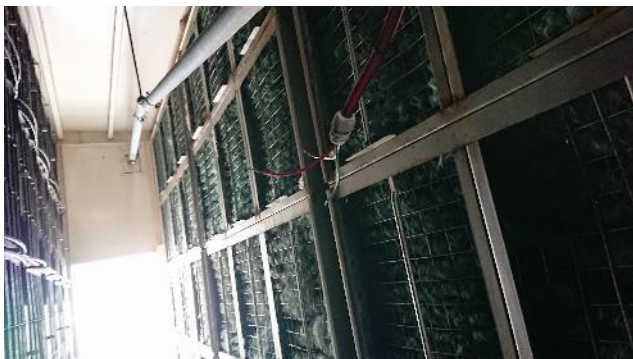


Figure 43: Filter house

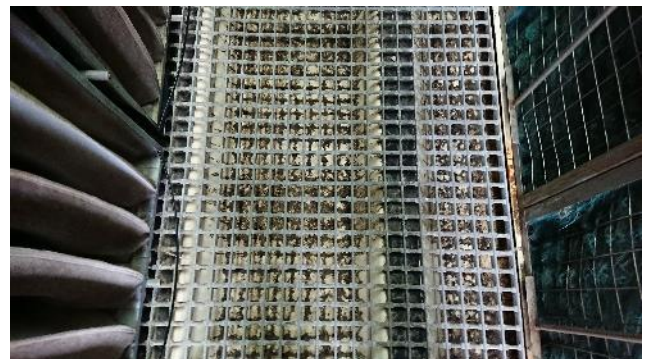


Figure 47: Filter house



Figure 44: Coalescing filters

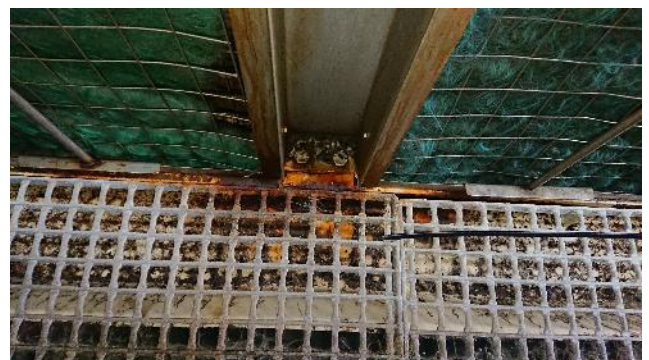


Figure 48: Filter house

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Figure 49: Filter house



Figure 53: Clean room



Figure 50: Filter house



Figure 54: Clean room

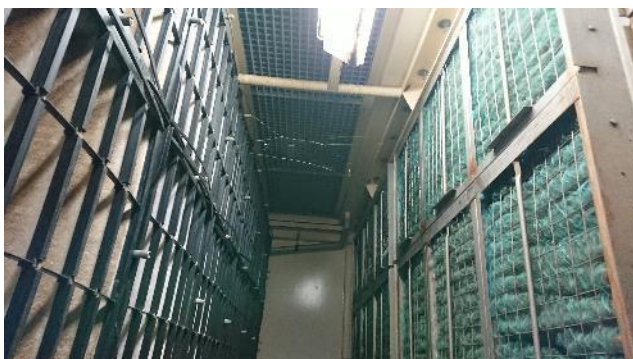


Figure 51: Filter house



Figure 55: Clean room



Figure 52: Filter house



Figure 56: Clean room

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Figure 57: Clean room



Figure 61: Clean room



Figure 58: Clean room

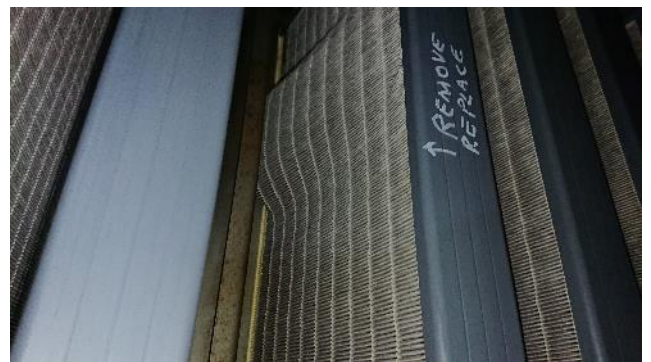


Figure 62: Clean room



Figure 59: Clean room



Figure 63: Clean room



Figure 60: Clean room



Figure 64: Clean room

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Figure 65: Compressor inlet



Figure 69: Compressor inlet



Figure 66: Compressor inlet

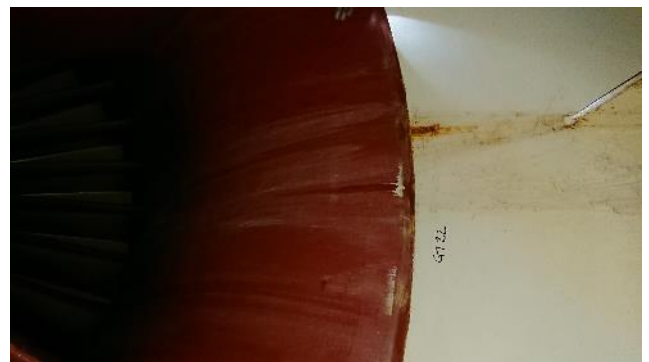


Figure 70: Compressor inlet



Figure 67: Compressor inlet



Figure 71: Compressor inlet



Figure 68: Compressor inlet



Figure 72: Compressor inlet

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Figure 73: Compressor inlet



Figure 77: VLe0 & VLa1



Figure 74: Compressor inlet

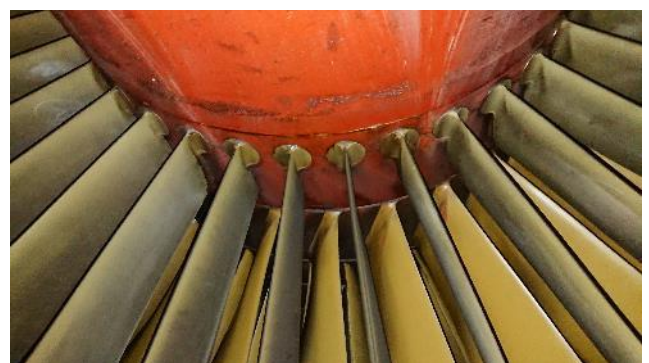


Figure 78: VLe0 & VLa1



Figure 75: VLe0 & VLa1



Figure 79: VLe0 & VLa1



Figure 76: VLe0 & VLa1



Figure 80: IC drain

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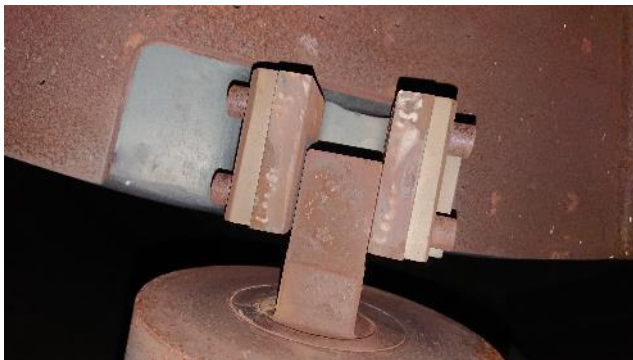


Figure 81: IC bottom key



Figure 85: CC1 MC CS guide



Figure 82: CC2 MC CS guide



Figure 86: CC1 IC CS support palm



Figure 83: CC2 IC CS support palm

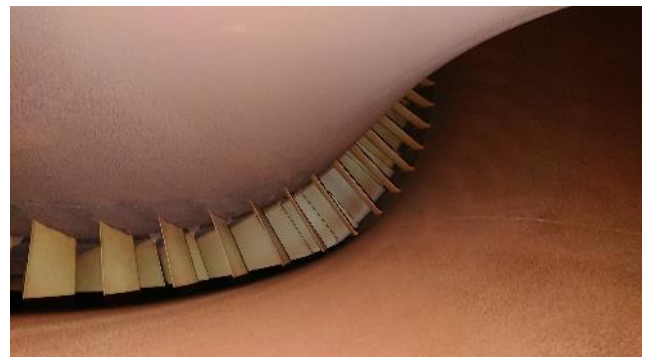


Figure 87: Compressor exhaust



Figure 84: CC2 MC bottom guide

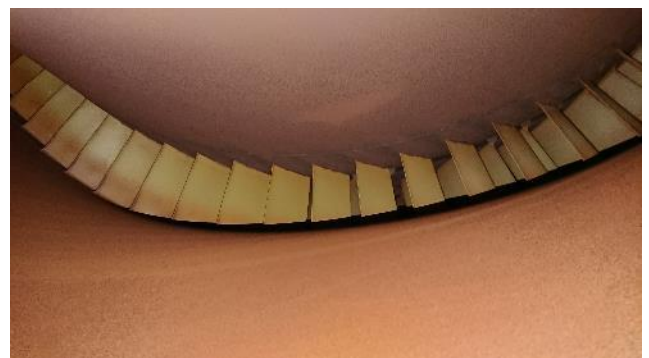


Figure 88: Compressor exhaust

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Figure 89: CC1 ceramic tiles

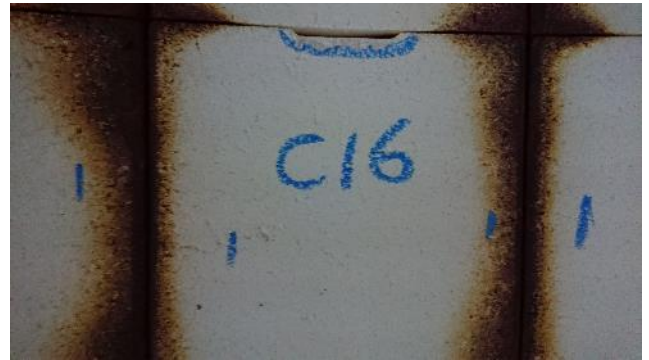


Figure 93: CC1 ceramic tiles



Figure 90: CC1 ceramic tiles

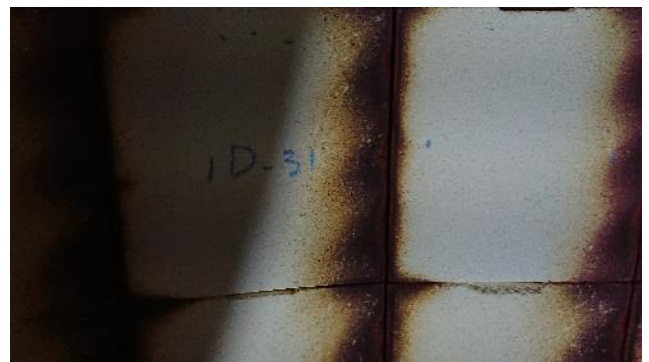


Figure 94: CC1 ceramic tiles



Figure 91: CC1 ceramic tiles

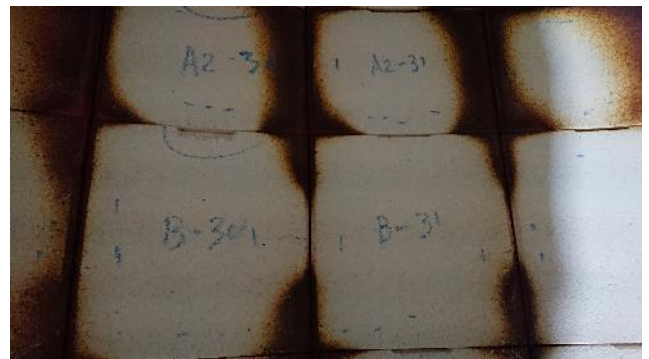


Figure 95: CC1 ceramic tiles



Figure 92: CC1 ceramic tiles



Figure 96: Burner 1-1

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Figure 97: Burner 1-1



Figure 101: Burner 1-2



Figure 98: Burner 1-1



Figure 102: Burner 1-2

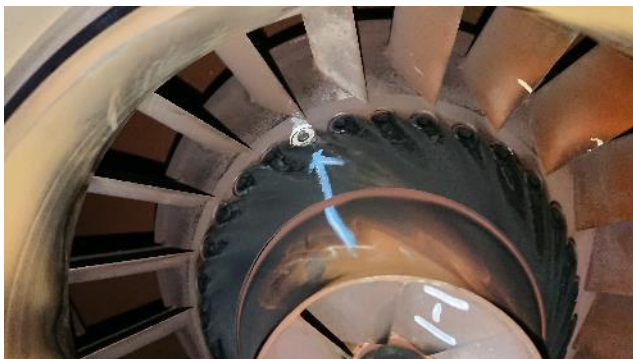


Figure 99: Burner 1-1



Figure 103: Burner 1-2



Figure 100: Burner 1-2

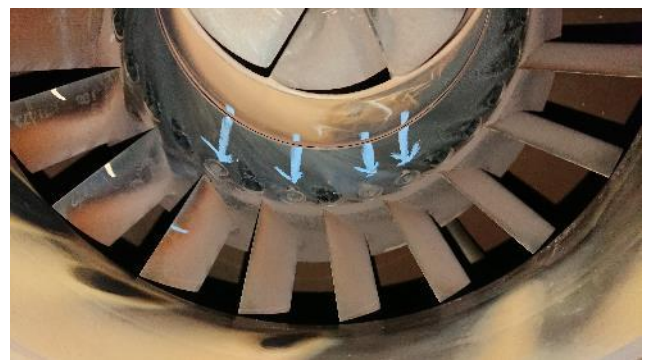


Figure 104: Burner 1-2

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Figure 105: Burner 1-3



Figure 109: Burner 1-3



Figure 106: Burner 1-3



Figure 110: Burner 1-4



Figure 107: Burner 1-3



Figure 111: Burner 1-4



Figure 108: Burner 1-3



Figure 112: Burner 1-4

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Figure 113: Burner 1-4



Figure 117: Burner 1-5



Figure 114: Burner 1-4



Figure 118: Burner 1-5

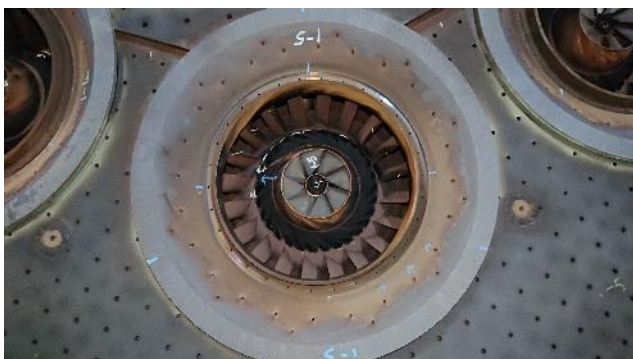


Figure 115: Burner 1-5



Figure 119: Burner 1-5



Figure 116: Burner 1-5



Figure 120: Burner 1-6

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Figure 121: Burner 1-6



Figure 125: Burner 1-7



Figure 122: Burner 1-6



Figure 126: Burner 1-7



Figure 123: Burner 1-6



Figure 127: Burner 1-7



Figure 124: Burner 1-6

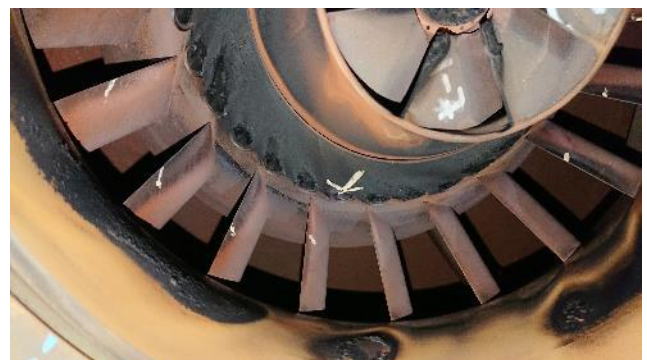


Figure 128: Burner 1-7

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Figure 129: Burner 1-7



Figure 133: CC2 ceramic tiles



Figure 130: Burner 1-8



Figure 134: CC2 ceramic tiles



Figure 131: Burner 1-8

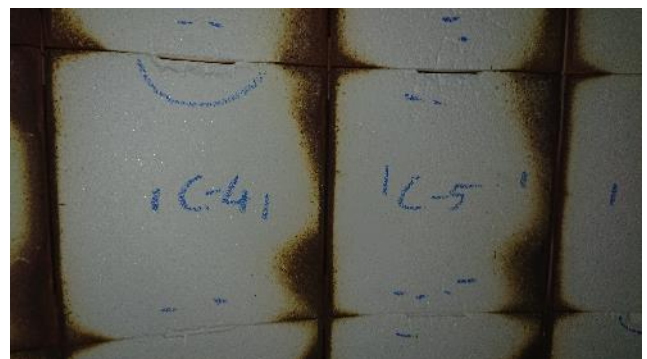


Figure 135: CC2 ceramic tiles



Figure 132: Burner 1-8



Figure 136: CC2 ceramic tiles

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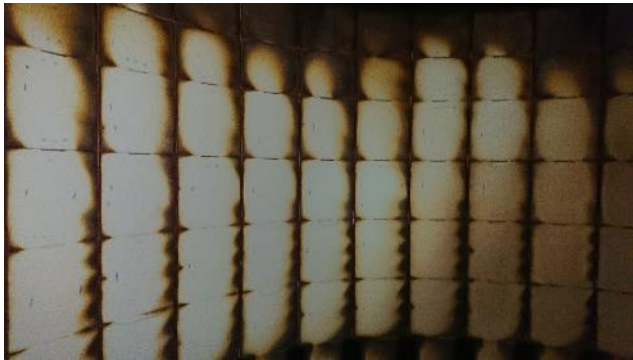


Figure 137: CC2 ceramic tiles

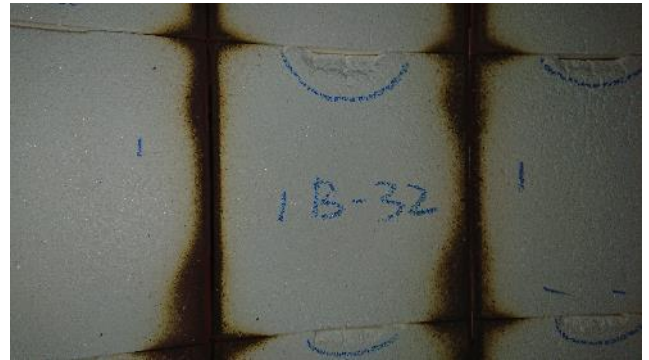


Figure 141: CC2 ceramic tiles



Figure 138: CC2 ceramic tiles



Figure 142: Burner 2-1

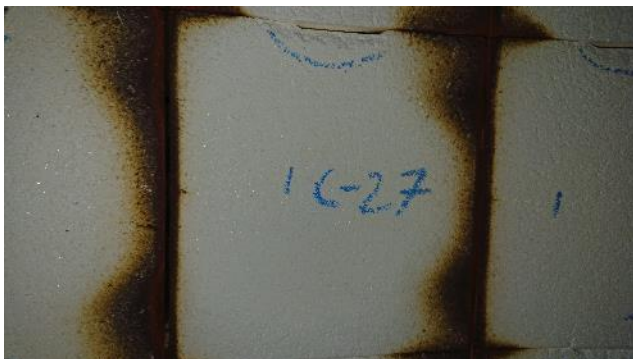


Figure 139: CC2 ceramic tiles



Figure 143: Burner 2-1

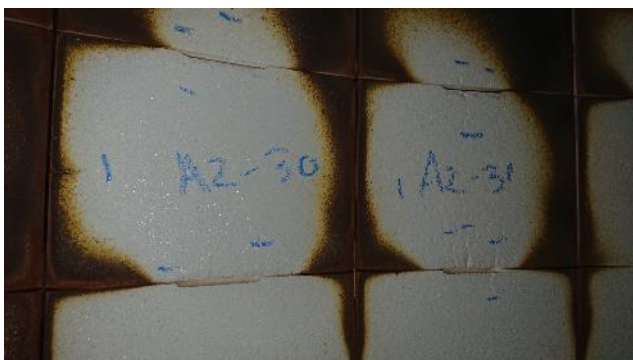


Figure 140: CC2 ceramic tiles



Figure 144: Burner 2-1

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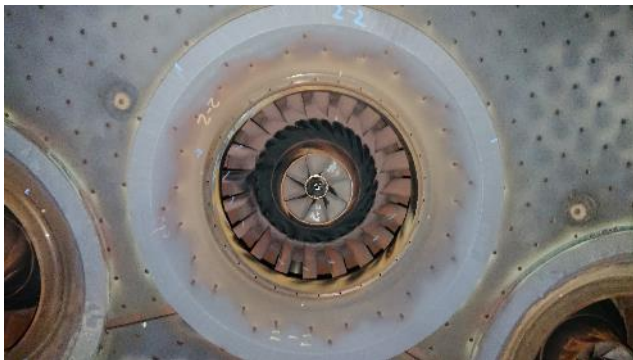


Figure 145: Burner 2-2



Figure 149: Burner 2-2



Figure 146: Burner 2-2



Figure 150: Burner 2-2



Figure 147: Burner 2-2



Figure 151: Burner 2-2

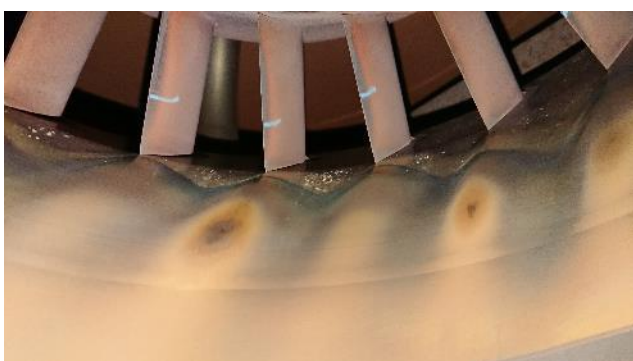


Figure 148: Burner 2-2



Figure 152: Burner 2-3

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Figure 153: Burner 2-3



Figure 157: Burner 2-4



Figure 154: Burner 2-3



Figure 158: Burner 2-4



Figure 155: Burner 2-3



Figure 159: Burner 2-4

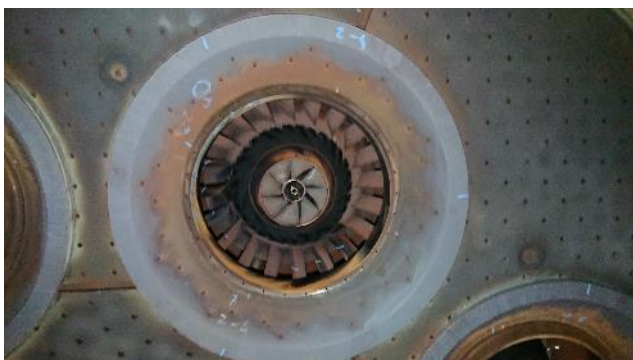


Figure 156: Burner 2-4



Figure 160: Burner 2-4

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Figure 161: Burner 2-4



Figure 165: Burner 2-5



Figure 162: Burner 2-4



Figure 166: Burner 2-5



Figure 163: Burner 2-5



Figure 167: Burner 2-5



Figure 164: Burner 2-5



Figure 168: Burner 2-5

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Figure 169: Burner 2-6



Figure 173: Burner 2-6



Figure 170: Burner 2-6



Figure 174: Burner 2-7



Figure 171: Burner 2-6



Figure 175: Burner 2-7



Figure 172: Burner 2-6



Figure 176: Burner 2-7

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Figure 177: Burner 2-7



Figure 181: IC hub



Figure 178: Burner 2-7



Figure 182: IC hub

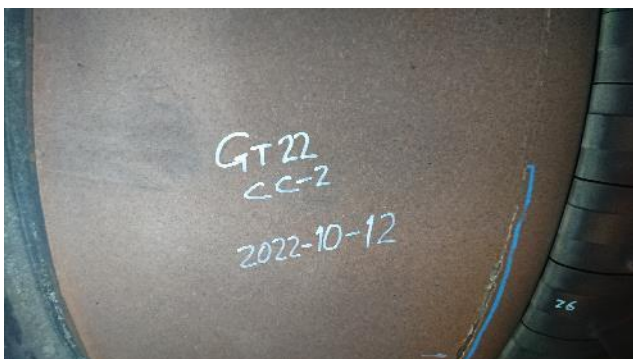


Figure 179: IC hub



Figure 183: TLe1



Figure 180: IC hub



Figure 184: TLe1 & TLa1

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Figure 185: TLe1



Figure 189: TLe1



Figure 186: TLe1 & TLa1



Figure 190: TLe1



Figure 187: TLe1 & TLa1



Figure 191: TLe1 & TLa1



Figure 188: TLe1



Figure 192: TLe1 & TLa1

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Figure 193: TLe1 & TLa1



Figure 197: IC

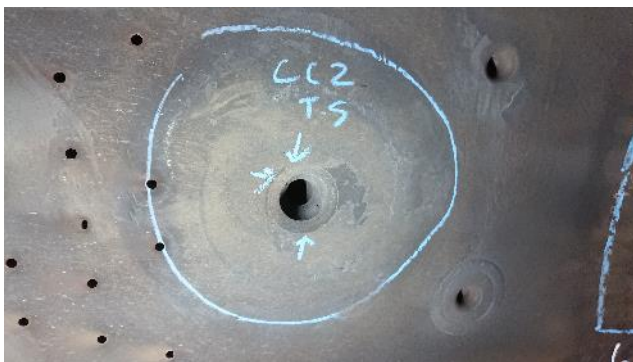


Figure 194: IC



Figure 198: IC



Figure 195: IC



Figure 199: CC2 MC to IC



Figure 196: IC



Figure 200: CC2 MC to IC

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Figure 201: CC2 MC to IC



Figure 205: CC2 FT to MC



Figure 202: CC2 MC to IC



Figure 206: CC2 MC



Figure 203: CC2 FT to MC



Figure 207: CC2 MC



Figure 204: CC2 FT to MC



Figure 208: CC2 MC

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Figure 209: CC2 MC



Figure 213: CC2 MC



Figure 210: CC2 MC



Figure 214: CC2 MC



Figure 211: CC2 MC



Figure 215: CC2 MC



Figure 212: CC2 MC



Figure 216: CC2 MC

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Figure 217: CC2 MC



Figure 221: CC1 FT to MC



Figure 218: CC2 MC



Figure 222: CC1 FT to MC



Figure 219: CC2 MC

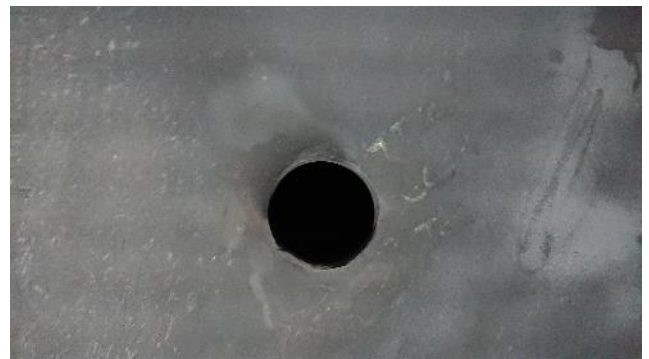


Figure 223: CC1 MC



Figure 220: TLe1



Figure 224: CC1 MC

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Figure 225: CC1 MC



Figure 229: CC1 MC



Figure 226: CC1 MC



Figure 230: CC1 MC



Figure 227: CC1 MC

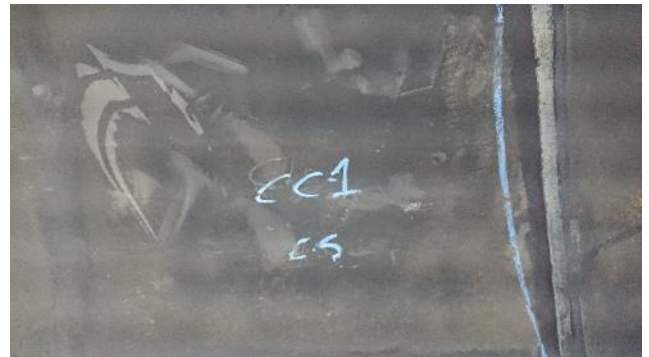


Figure 231: CC1 MC



Figure 228: CC1 MC



Figure 232: CC1 MC

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Figure 233: CC1 MC



Figure 237: CC1 MC to IC



Figure 234: CC1 MC



Figure 238: IC



Figure 235: CC1 MC to IC



Figure 239: IC



Figure 236: CC1 MC to IC



Figure 240: IC

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Figure 241: IC



Figure 245: IC

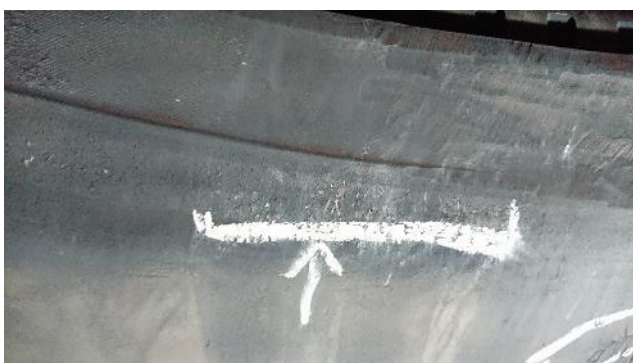


Figure 242: IC



Figure 246: IC hub



Figure 243: IC



Figure 247: IC



Figure 244: IC



Figure 248: TLe1 & TLa1

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Figure 249: TLe1



Figure 253: TLe1



Figure 250: TLe1



Figure 254: TLe1



Figure 251: TLe1



Figure 255: TLe1



Figure 252: TLe1

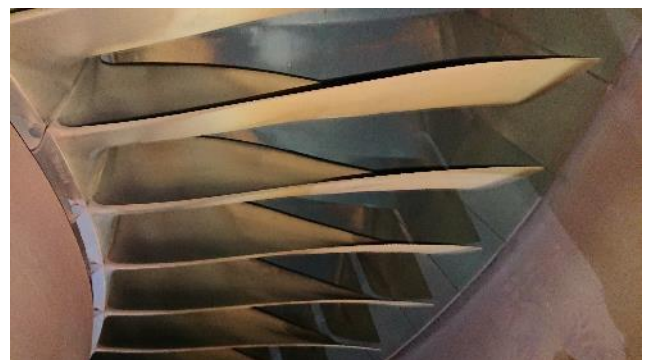


Figure 256: TL4 & TLe4

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Figure 257: TLa4

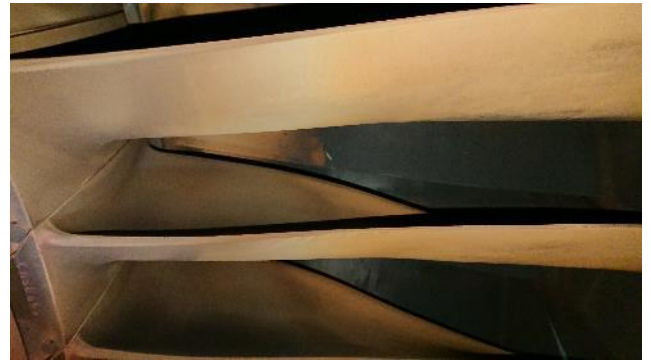


Figure 261: TLa4 & TLe4



Figure 258: TLa4



Figure 262: TLa4 & TLe4

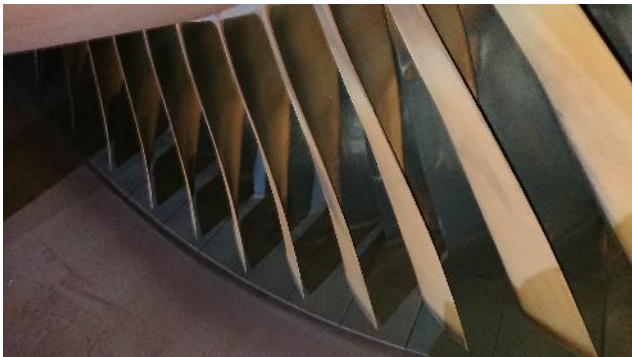


Figure 259: TLa4 & TLe4



Figure 263: TLa4



Figure 260: TLa4 & TLe4

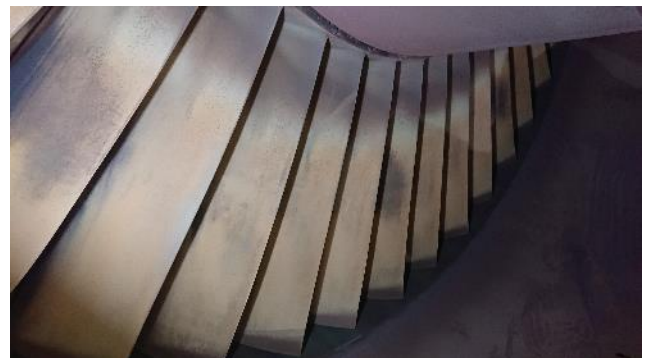


Figure 264: TLa4

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Figure 265: TLa4 & TLe4



Figure 269: Exhaust – example of crack



Figure 266: Exhaust cushion



Figure 270: Exhaust – example of crack



Figure 267: Exhaust cushion



Figure 271: Exhaust – example of crack



Figure 268: Exhaust cushion



Figure 272: Exhaust – example of crack

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Figure 273: Exhaust – example of crack

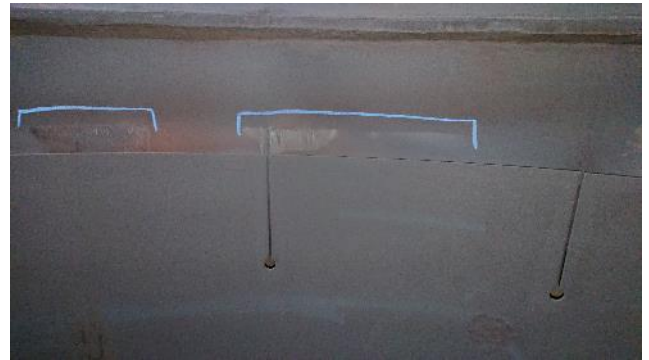


Figure 277: Exhaust – example of rubbing



Figure 274: Exhaust – example of rubbing



Figure 278: Exhaust – example of rubbing



Figure 275: Exhaust – example of rubbing



Figure 279: Exhaust – example of rubbing



Figure 276: Exhaust – example of rubbing



Figure 280: Exhaust – example of rubbing

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Figure 281: Exhaust – example of rubbing



Figure 282: Exhaust – example of rubbing



Figure 283: Exhaust – example of crack



Figure 284: Exhaust – example of crack



Figure 285: Exhaust – example of crack



Figure 286: Exhaust – example of crack



Figure 287: Exhaust – example of crack



Figure 288: Exhaust – example of crack

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Figure 289: Exhaust – example of hammering

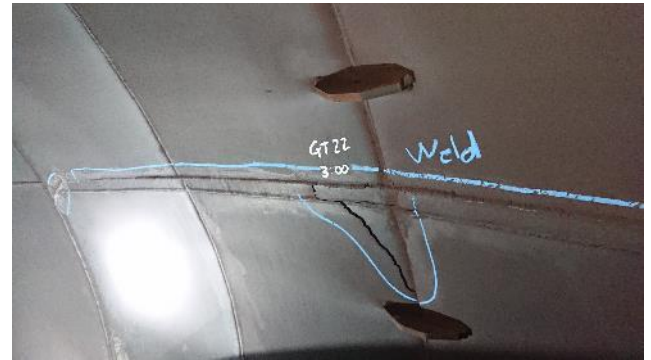


Figure 293: Exhaust – example of crack



Figure 290: Exhaust – example of crack



Figure 294: Exhaust – example of crack

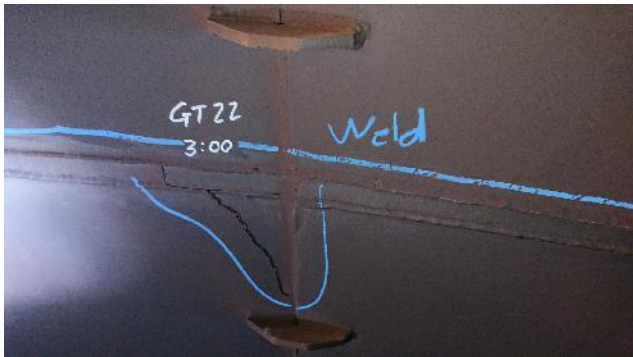


Figure 291: Exhaust – example of crack



Figure 295: Exhaust – example of crack



Figure 292: Exhaust – example of crack



Figure 296: Exhaust – example of crack

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Figure 297: Exhaust – example of crack



Figure 301: Exhaust – example of crack



Figure 298: Exhaust – example of crack



Figure 299: Exhaust – example of crack

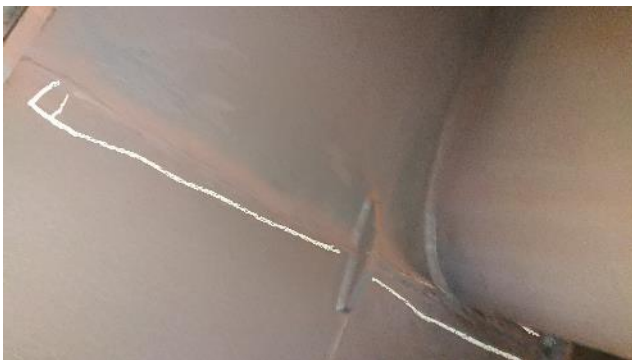



Figure 300: Exhaust – example of crack

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Form No.: 240-94066774 Rev 0

	Business Management System Inspection Report Gourikwa – GT22 Minor Inspection	Document Identifier	195/454	Rev	0
		Date	30/01/2023		
		Page	59 of 101		

APPENDIX B

 Decommissioning	ESKOM GOURIKWA POWER STATION Leak Check Visual Inspection	Unit #: GT22 Checksheet Reference #: 9002 Page #: 3 of 5 Project #: GOU.M13
	Siemens SGT5-2000E Gas Turbine	Relevant Procedures: Decommissioning

Notes:

- 1 All fuel, gas and oil piping systems need to be inspected for possible leakage with the machine on load.
- 2 When inspecting gas pipelines, use a foam-forming agent or gas detectors.
- 3 High-frequency blowing noises during GT operation are normally associated with leaks at the half-joints, housing connections or manhole covers.
- 4 Request from the client a list of any / all leakage-related non-conformities prior to the outage.
- 5 Record all anomalies in the spaces below, and add photos of all anomalies to the back of this checksheet.

Control oil skid including pipework to Control valves

Minor oil residue

Skid slightly dirty

Lube oil and Jacking oil skid including pipework to all bearings

Pipework slightly dirty



Oil residue on pipework

Oil residue on skid

22MBV21AA301 - Seepage from valve

Drip tray at jacking oil filter

Drip tray at main oil filter

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	NAME:	P.L. Calana
SIGNATURE:		SIGNATURE:	SIGNATURE:	
DATE:	Log #:	DATE:	DATE:	2022/01/11

Check Sheet 1: Leak check - VI

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Form No.: 240-94066774 Rev 0



Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

Document Identifier	195/454	Rev	0
Date	30/01/2023		
Page	60 of 101		

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Leak Check Visual Inspection	Checksheet Reference #:	9002
Decommissioning	Siemens SGT5-2000E Gas Turbine	Page #:	2 of 5
		Project #:	GOU.MI3
		Relevant Procedures:	Decommissioning

Notes:

- 1 All fuel, gas and oil piping systems need to be inspected for possible leakage with the machine on load.
- 2 When inspecting gas pipelines, use a foam-forming agent or gas detectors.
- 3 High-frequency blowing noises during GT operation are normally associated with leaks at the half-joints, housing connections or manhole covers.
- 4 Request from the client a list of any / all leakage-related non-conformities prior to the outage.
- 5 Record all anomalies in the spaces below, and add photos of all anomalies to the back of this checksheet.

Fuel oil skid including pipework to Combustion chambers

Skid slightly dirty

Drip trails under mechanical seals at fuel oil supply pump

Tag loose, out of place - 22MBN13AA219

Ignition Gas skid including pipework to Combustion chambers

No findings

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/10/11


Check Sheet 2: Leak check - VI


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Form No.: 240-94066774 Rev 0

	Business Management System Inspection Report Gourikwa – GT22 Minor Inspection	Document Identifier	195/454	Rev	0
		Date	30/01/2023		
		Page	61 of 101		

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Insulation	Checksheet Reference #:	V94-2-6004
	Siemens SGT5-2000E	Page #:	1 of 4
	Centreline	Project #:	GOU.MB
Inspection		Relevant Procedures:	13: Combustion chamber inspections; 12: Compressor inspections; 33 - Turbine Inspections

Notes:

The term "Insulation" refers to cladding, lagging, cushions and any other form of insulation used on the centreline



Inspect the insulation for:

- Mechanical damage,
- Thermal degradation,
- Moisture contamination,
- Fastener integrity

Combustion Chambers
Cladding dirty White deposits

Centre Casing
Corrosion White deposits Dirty casing Dent on LHS near CC

Exhaust Casing
Corrosion and white deposits Dirty casing Casing to structure seal damaged - bottom notably Dent on LHS top Cladding separating damaged - Repeat finding

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/10/11

Check Sheet 3: Insulation - VI

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

Document Identifier	195/454	Rev	0
Date	30/01/2023		
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	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Combustion Chamber Outer Pipework Visual Inspections - LHS		Checksheet Reference #:	V94-2-2016
Inspection	Siemens SGT5-2000E Combustion		Page #:	1 of 2
			Project #:	GOU.MB
			Relevant Procedures:	13. Inspection of CC

Area	Inspection	Findings	Remarks
Fuel Oil Return Line	Signs of overheating / Discoloration	No	
	Paint Burned Off	No	
	Coking / Soot	No	
Fuel Oil Supply Line	Corrosion	No	
	Damage	No	
Fuel Gas Line	Damage	No	
	Discoloration	No	
Fuel Gas Expansion Joints	Damage	No	
	Corrosion	No	
	Deformation (Stretching / Axial Offset of Bellows)	No	
	Stress-free installation	No	
Thread Lockers, Lock Washers, and Nord-Lock Positive Lock Washers		Adequate Locking (Flanges that are not normally loosened)	No
Remaining Pipework	Cracks	No	
	Abraded regions	No	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:		DATE:		DATE: 2022/10/11

Check Sheet 4: CC1 - VI

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Combustion Chamber Outer Pipework Visual Inspections - RHS	Checksheet Reference #:	V94-2-2016
Inspection	Siemens SGT5-2000E	Page #:	2 of 2
	Combustion	Project #:	GOU.MB
		Relevant Procedures:	13. Inspection of CC

Area	Inspection	Findings	Remarks
Fuel Oil Return Line	Signs of overheating / Discoloration	No	-Diffusion leakage line excessive movement - site to constrain
	Paint Burned Off	No	
	Coking / Soot	No	
Fuel Oil Supply Line	Corrosion	No	
	Damage	No	
Fuel Gas Line	Damage	No	
	Discoloration	No	
Fuel Gas Expansion Joints	Damage	No	
	Corrosion	No	
	Deformation (Stretching / Axial Offset of Bellows)	No	
	Stress-free installation	No	
Thread Lockers, Lock Washers, and Nord-Lock Positive Lock Washers	Adequate Locking (Flanges that are not normally loosened)	No	
Remaining Pipework	Cracks	No	
	Abraded regions	No	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/11

Check Sheet 5: CC2 - VI

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Leak Check Visual Inspection	Checksheet Reference #:	9002
Decommissioning	Siemens SGT5-2000E	Page #:	1 of 5
	Gas Turbine	Project #:	GOU.MI3
		Relevant Procedures:	Decommissioning

Notes:

- 1 All fuel, gas and oil piping systems need to be inspected for possible leakage with the machine on load.
- 2 When inspecting gas pipelines, use a foam-forming agent or gas detectors.
- 3 High-frequency blowing noises during GT operation are normally associated with leaks at the half-joints, housing connections or manhole covers.
- 4 Request from the client a list of any / all leakage-related non-conformities prior to the outage.
- 5 Record all anomalies in the spaces below, and add photos of all anomalies to the back of this checksheet.

LHS Combustion chamber

Minor seepage on pre-mix bellow burner 1-2

Flaking of paint

Light bulb on platform - poor housekeeping

Roof overhead corroding severely - possible leaks

RHS Combustion chamber

Flaking of paint

Dome insulation rubber loose

Equipment cable loose

Broken tag - 22MBM22CT109

Delta P pipe support inadequate

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ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/10/11


Check Sheet 6: Leak check - VI


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	Business Management System Inspection Report Gourikwa – GT22 Minor Inspection	Document Identifier	195/454	Rev	0
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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Insulation	Checksheet Reference #:	V94-2-6004
	Siemens SGT5-2000E	Page #:	2 of 4
	Centreline	Project #:	GOU.MB
Inspection	Relevant Procedures:	33 - Turbine inspections, 13. Combustion chamber inspections, 16. Blow-off line inspections	

Notes:

The term "Insulation" refers to cladding, lagging, cushions and any other form of insulation used on the centreline



Inspect the insulation for:

- Mechanical damage,
- Thermal degradation,
- Moisture contamination,
- Fastener integrity

Exhaust Diffusor
No findings

Blow-off Pipes
Corrosion
Dirty
White deposits

Fuel Oil Lines
No findings

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/11

Check Sheet 7: Insulation - VI

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Leak Check Visual Inspection	Checksheet Reference #:	9002
Decommissioning	Siemens SGT5-2000E Gas Turbine	Page #:	4 of 5
		Project #:	GOU.MI3
		Relevant Procedures:	Decommissioning

Notes:

- 1 All fuel, gas and oil piping systems need to be inspected for possible leakage with the machine on load.
- 2 When inspecting gas pipelines, use a foam-forming agent or gas detectors.
- 3 High-frequency blowing noises during GT operation are normally associated with leaks at the half-joints, housing connections or manhole covers.
- 4 Request from the client a list of any / all leakage-related non-conformities prior to the outage.
- 5 Record all anomalies in the spaces below, and add photos of all anomalies to the back of this checksheet.

GT centerline (under GT, at the Intermediate shaft, Compressor Bearing housing, Turning gear, and SSS Clutch if installed)

Compressor inlet cone: Compressor bearing jacking oil supply line bracket broken/missing - Repeat finding

Minor oil seepage

Generator (including bearings and oil seals)

Historic oil seepage, TE pedestal & EE pedestal

Structure corroded, damaged

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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
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ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P. L. Galana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/10/11


Check Sheet 8: Leak check - VI


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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Insulation	Checksheet Reference #:	V94-2-6004
		Page #:	4 of 4
		Project #:	GOU.MB
Inspection	Siemens SGT5-2000E Centreline	Relevant Procedures:	12: Compressor Inspections; 33: Inspection - Turbine Inspections

Notes:
 The term "Insulation" refers to cladding, lagging, cushions and any other form of insulation used on the centreline
 Inspect the insulation for:
 Mechanical damage,
 Thermal degradation,
 Moisture contamination,
 Fastener integrity

Turbine Bearing Hub Cover Plate
<u>No findings</u>

Generator
<u>Walkway on RHS unstable</u>

Intermediate shaft
<u>No findings</u>

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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/11


Check Sheet 9: Insulation - VI

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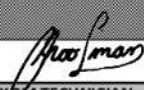

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Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Filter House Visual Inspection		Checksheet Reference #:	V94-2-1901
Inspection	Siemens SGT5-2000E Compressor		Page #:	1 of 6
			Project #:	GOU.MB
			Relevant Procedures:	15. NDT WI and 12. Inspection - Compressor inspections

Area	Inspection Type	Findings	Remarks
Dirty Side	Deposits	Yes	
	Damage	Yes	Light cubling hanging loose
	Filter Completeness	No	
	Detached parts / Loose Filters	Yes	Coalescing filters out of position
	Soiling of Filters	Yes	
	Non-Uniform alignment of Filters	No	
	Unexpected Modifications	Yes	Not all pre-filters are at the same design
	Missing Filters	No	
	Foreign Objects	Yes	Cobwebs lower right - when last did OPS perform walkdown
Clean Side	Deposits	Yes	Extremely wet
	Damage	No	Damaged filters marked for replacement - 7 off
	Detached parts / Loose Filters	No	Filters very dirty
	Formation of Gaps (Light Test)	No	Site to clean (extensive)
	Flaking of paint / Corrosion	Yes	
	Locking	No	
	Foreign Objects	Yes	Significant water in gutter not draining
Structure	Damage to Door Seals	Yes	Bottom middle
	Damage to Door Locks	Yes	Top LHS cannot unlock
	Damage to seals in the Wall region	No	
	Holes in the Wall	No	
Silencer	Detached Parts / Loose Elements		
	Deposits, Corrosion	Yes	
	Cracks	No	
	Damage	No	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/10/13

Check Sheet 10: Filter house - VI

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Inspection Report
Gourikwa – GT22 Minor
Inspection

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ESKOM GOURIKWA POWER STATION

Compressor Inlet Systems
Visual Inspection

Unit #:

GT22

Checksheet Reference #:

V94-2-1901

Page #:

2 of 6

Project #:

GOU.MB

Inspection

Siemens SGT5-2000E
Compressor

Relevant Procedures:

15. NDT WI and 12. Inspection -
Compressor inspections

Area	Inspection Type	Findings	Remarks
Air Intake Flap	Proper Operation	Yes	Compressor wash - Inadequate rinsing performed
	Loose Parts	No	Residual soap caused bubbling of paint
	Foreign Objects	No	
	Corrosion	Yes	Site to clean and ensure compressor wash to be performed according to procedure
	Damage	No	
Air Intake	Loose Parts	No	
	Foreign Objects	No	
	Deposits	Yes	
	Oil	No	
	Proper installation of intake Gaskets	No	
Gasket between Cone and Inlet Structure	Damage	Yes	Incomplete, historically marked
	Oil Saturation	No	
Intake Cone Half-Joint Flat Gasket	Damage	No	Done during Major
Air Intake Structure	Damage to Door Seals	No	
	Damage to Door Locks	No	
	Damage to seals in the Wall region	No	
	Holes in the Wall	No	
	Oil through the Wall	No	
	Flaking of Paint / Corrosion	Yes	
Intake Cone	Deposits / Oil Traces	Yes	
	Foreign Objects	No	
	Incomplete Painting	Yes	
	Corrosion	Yes	
Support Struts	Cracks	No	Done during Major

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	P.L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:	2022/10/13	

Check Sheet 11: Compressor inlet systems - VI

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Inspection Report
Gourikwa – GT22 Minor
Inspection

Document Identifier	195/454	Rev	0
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	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Compressor Inlet Systems Visual Inspection		Checksheet Reference #:	V94-2-1901
			Page #:	3 of 6
			Project #:	GOU.MB
Inspection	Siemens SGT5-2000E Compressor		Relevant Procedures:	15. NDT WI and 12. Inspection - Compressor inspections

Area	Inspection Type	Findings	Remarks
Compressor Washing System	Tack Welds Cracks	No	
	Tack Welds Number of Welds	No	
	Pipe Clamps Damage	No	
	Pipe Clamps Cracks	No	
	Nozzles Correct Alignment	No	
	Deposits	No	
	Clogging	No	
	Missing Components	No	
	Corrosion	Yes	
Dehumidification System and Unit	Damage	No	
	Foreign Objects	No	
	Pipe Damage	No	
	Soiling / Clogging of Filters	No	
	Corrosion of Pipes in Intake Region	No	
	Damage / Deformation of Pipes in Flow Path	No	
Area of VIGV adjustment range	Inner Wall Scoring	No	
	Outer Wall Scoring	No	
Stage 1 Blades	Rubbing between Blades and Casing	No	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P. L. Galana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 12: Compressor inlet systems - VI

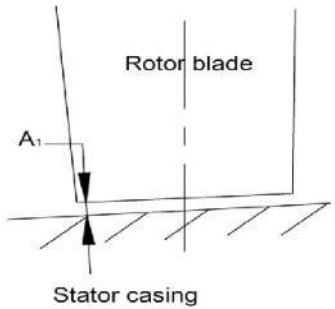
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	ESKOM GOURIKWA POWER STATION Compressor Stage 1 Radial Blades Tip Clearances (VLA1)	Unit #: GT22 Checksheet Reference #: V94-2-6102 Page #: 1 of 2 Project #: GOU.MI3
	Disassembly Siemens SGT5-2000E Centreline	Relevant Procedures: 03. Pre-disassembly inspections and measurements



Notes:
Values determined at minimum clearance for each measuring point using a feeler gauge

Remarks:

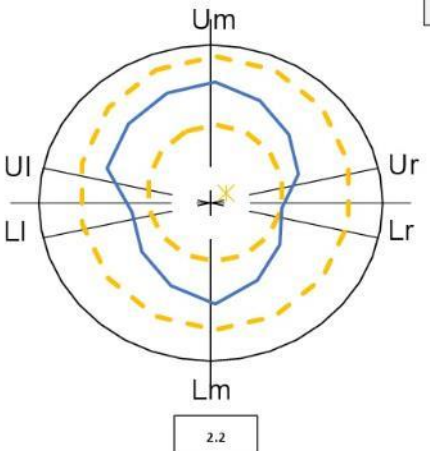
Similar distribution to previous outage

ΔS

0.2

2.2

2.0



2.0



1.9

ΔS

0.1

Theoretical Centre	
Top	Right
0.00	0.06

Specifications	Min	Max
Blade clearance	1.9	2.3
ΔS		0.1

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ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
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Check Sheet 13: VLA1 radial blade tip clearances

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ESKOM GOURIKWA POWER STATION

Unit #:

GT22

Diffuser
Inspection

Checksheet Reference #:

V94-2-1604

Page #:

1 of 1

Project #:

GOU.MB

Inspection

Siemens SGT5-2000E
Compressor

Relevant Procedures:

12. Inspection - Compressor Visual
Inspections Work Instruction

Visual Inspection

Area to Inspect	Findings	Remarks
Vanes - Lock Washers Damage	No	CC2 MC CS Misalignment (Guide Plate)
Vanes - Lock Washers Installation Configuration	No	
Vanes - Lock Washers Loose Components	No	
Vanes - Lock Washers Offset	No	
Vanes Deformation	No	
Vanes FOD	No	
Vanes Cracks	No	
Vane Screws Tightness	No	
Seal Tips Wear		
Seal Tips Material break-out		
Seal Tips Cracks		
Seal Tips Bending Deformation		
Seal Tips Height Uniformity Deviations		
Inner Casing Slot Mechanical Material Thinning		
Anti-rotation Pin Pressure marks		
Anti-rotation Pin Wear		
Anti-rotation Pin Fracture		
Half-joint Faces Cracks		

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ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/13

Check Sheet 14: Compressor diffusor - VI

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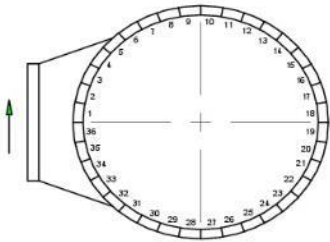
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Check Sheet 17: CC2 FT - VI

Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION RHS Flame Tube - Ceramic Tile Inspection	Unit #: GT22 Checksheet Reference #: V94-2-2006-2 Page #: 1 of 1 Project #: GOU.M13
	Inspection Siemens SGT5-2000E Combustion	Relevant Procedures: 13. Inspection of CC



Remarks: Cold patch in the vicinity of burner 2-5

Hot spot in the vicinity of burner 2-6



C-32 did not require replacement

Row	Column	Tile Status
1	1	
1	2	
1	3	
1	4	
1	5	
1	6	
1	7	
1	8	
1	9	
1	10	
1	11	
1	12	
1	13	
1	14	
1	15	
1	16	
1	17	
1	18	
1	19	
1	20	
1	21	
1	22	
1	23	
1	24	
1	25	
1	26	
1	27	
1	28	
1	29	
1	30	
1	31	
1	32	
1	33	
1	34	
1	35	
1	36	

Tiles to be Removed	4
Tiles to be Replaced	1

Key	
Crack	C
Partial Crack	P
Missing Tile	M
Partly Missing Tile	G
Loose Tile (clearance > 7mm)	L
No deviations	
Damaged during disassembly	D
Tile holder damage	^
Replace	
Remove	

*Note: Tiles to be removed in order to reach/replace damaged tiles

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 18: CC2 Ceramic tile inspection

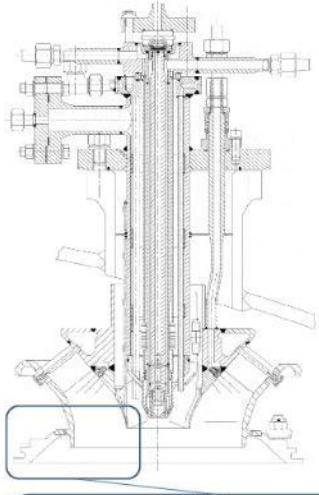
Controlled Disclosure

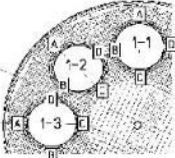
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Form No.: 240-94066774 Rev 0

 Disassembly	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	LHS CC Burner Alignment		Checksheet Reference #:	V94-2-2010-1
	Siemens SGT5-2000E Combustion		Page #:	1 of 2
			Project #:	GOU.MB
			Relevant Procedures:	07. Disassembly of Combustion Chambers

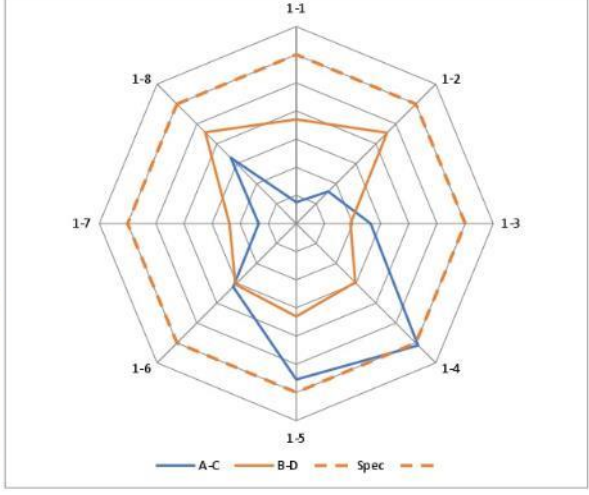




Viewed from below





Viewed from Above



Location	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8
A	5.4	5.6	4.7	6.4	6.6	5.8	5.1	5.2
B	5.6	5.9	4.3	5.0	5.1	4.9	5.1	4.8
C	6.5	6.3	4.8	4.8	5.4	5.7	5.9	5.0
D	5.2	5.1	4.9	5.0	5.0	4.9	5.4	4.0
A-C	1.1	0.7	0.2	1.6	1.3	0.1	0.8	0.2
B-D	0.4	0.8	0.5	0.0	0.1	0.0	0.3	0.8

Spec	Max
Mis-alignment	1.5

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/11


Check Sheet 19: CC1 burner alignment

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Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Hot Side Dome Plate LHS CC	Checksheet Reference #:	V94-2-2009-1
	Siemens SGT5-2000E	Page #:	1 of 2
	Combustion	Project #:	GOU.MB
Disassembly		Relevant Procedures:	03. Pre-disassembly inspections and measurements

Bottom plate Left
View in opposite flow direction

Rotor Shaft

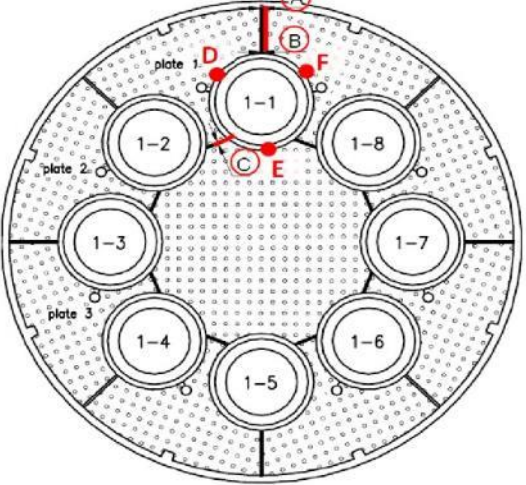




Plate	A	B	C	D	E	F
1	10.3	11.3	4.0	17.9	13.6	14.7
2	10.6	9.6	1.8	13.7	13.6	18.9
3	11.7	12.1	8.1	20.1	14.5	14.8
4	11.8	11.0	15.4	19.1	13.2	19.2
5	8.7	10.2	20.9	20.1	12.1	19.3
6	10.8	11.2	18.9	17.4	12.8	18.1
7	10.8	11.2	13.7	19.6	12.3	18.8
8	12.3	11.5	9.1	16.1	15.6	19.1

Remarks: _____

Spec	Min	Max
A	8	12
B	8	12
C	8	12

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:	P. L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:	2022/10/11	


Check Sheet 20: CC1 dome plate clearances

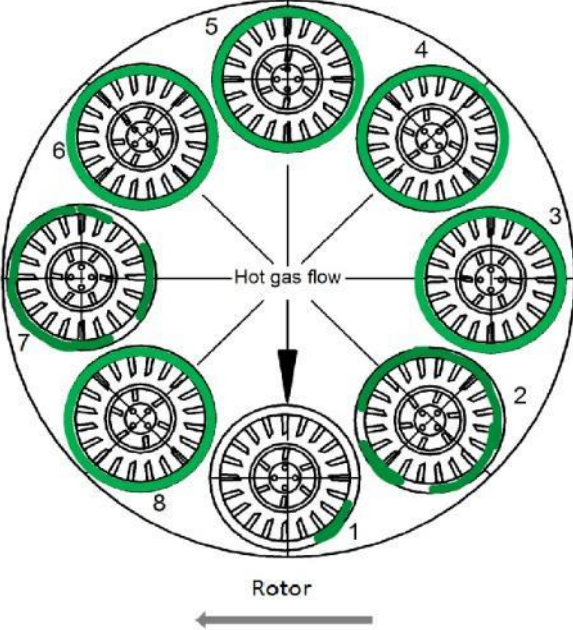
Controlled Disclosure

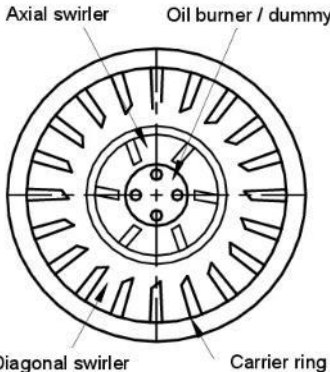
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Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	LHS CC Burner Assembly Visual Inspection	Checksheet Reference #:	V94-2-2012-1
		Page #:	1 of 1
		Project #:	GOU.MI3
Inspection	Siemens SGT5-2000E Combustion	Relevant Procedures:	03. Pre-disassembly inspections and measurements







Remarks: Burnin Insert Ring (BIR) Cracks: 1-3; 1-4; 1-5; 1-6

Corrosion marked

Key

Corrosion	

RESPONSIBLE PERSON		NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN					
CHECKED BY - SUPERVISOR					M & TE NUMBER:
CHECKED BY - QC					TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN					
ERI ENGINEER		Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER	
NAME:		NAME:		NAME:	P. L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:	
DATE:		DATE:		DATE:	2022/10/11

Check Sheet 21: CC1 burner assembly - VI

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Form No.: 240-94066774 Rev 0



Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

Document Identifier	195/454	Rev	0
Date	30/01/2023		
Page	80 of 101		

	ESKOM GOURIKWA POWER STATION		Unit #:		GT22			
	Diffusion Burners LHS Visual Inspections		Checksheet Reference #:		V94-2-2023-1			
Inspection	Siemens SGT5-2000E Combustion		Page #:		1 of 1			
			Project #:		GOU.MB			
			Relevant Procedures:		15. NDT WI and 13. Inspection of CC			

Area	Inspection	Burner 1-1	Burner 1-2	Burner 1-3	Burner 1-4	Burner 1-5	Burner 1-6	Burner 1-7	Burner 1-8
Fuel Oil Lance	Discoloration	No	No	No	No	No	No	No	No
	Erosion *Boroscopic Inspection*								
	Seat								
	Scaling								
	Deposits								
	Discoloration								
Burner Needle	Signs of overheating								
	Cracks *Boroscopic Inspection*								
	Correct Installation								
	Boroscopic Inspection								
Axial Swirlers	Deposits	No	Yes	Yes	Yes	No	Yes	Yes	No
	Clogging of bores	No	No	No	No	No	No	No	No
	Deformation of Vanes	No	No	No	No	No	No	No	No
	Scaling	No	No	No	No	No	No	No	No
	Erosion	No	No	No	No	No	No	No	No
	Cracks	No	No	No	No	No	No	No	No
	Discoloration	No	Yes	Yes	Yes	No	No	No	Yes
Burner Support	Corrosion / Damage								
	Discoloration								
	Signs of Overheating								
	Cracks								
Igniter	Damage								
	Spark Test								
Thermo-couples	Damage								

Remarks: _____

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Caliana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/11

Check Sheet 22: CC1 diffusion burner - VI

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Form No.: 240-94066774 Rev 0



Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

Document Identifier

195/454

Rev

0

Date

30/01/2023

Page

81 of 101



ESKOM GOURIKWA POWER STATION

Unit #:

GT22

Checksheet Reference #:

V94-2-2028

Page #:

1 of 3

Project #:

GOU.M13

Inspection

Siemens SGT5-2000E
Combustion

Relevant Procedures:

15. NDT WI and 13. Inspection of CC

Area	Inspection	Burner 1-1	Burner 1-2	Burner 1-3	Burner 1-4	Burner 1-5	Burner 1-6	Burner 1-7	Burner 1-8
Nozzles	Deposits / Coking / Plugging	Yes	Yes	Yes	Yes	Yes	No	Yes	No
	Hub - Deposits / Coking	Yes	Yes	Yes	Yes	No	No	No	No
	Hub - Fit of Nozzles								
Diagonal Swirler Entire Surface	Deposits / Coking / Plugging								
	Corrosion	No	No	No	No	Yes	Yes	Yes	No
	Deformation	No	No	No	No	No	No	No	No
	Material Break-out	No	No	No	No	No	No	No	No
	Hammering Marks to Burner Insert Ring								
	Hammering Marks to Axial Swirler								
	Tight fit of Vanes								
	Misalignment								
	Clogging of Premix Gas Nozzles								
	Signs of Overheating	No	No	Yes	No	No	Yes	No	Yes
	Cracks	No	No	No	No	No	Yes	No	No
Expansion Joint	Damage								
Hold-downs for Diagonal Swirler	Wear								
	Cracks								
	Tight fit								
Gas Distributor (Spider)	Corrosion								
	Cracks								
	Deposits "Boroscopic Inspection"								

Remarks: OH 1-1: 4 1-5: 4 1-1 white deposits noted on DS
1-2: 3 1-6: 6
1-3: 5 1-7: 7 Burners plugged: 1-2: 5; 1-3: 6 1-4: 1 1-5: 2 1-7: 1
1-4: 9 1-8: 4

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/11


Check Sheet 23: CC1 premix burner - VI

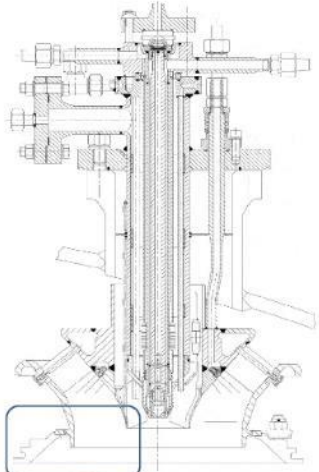
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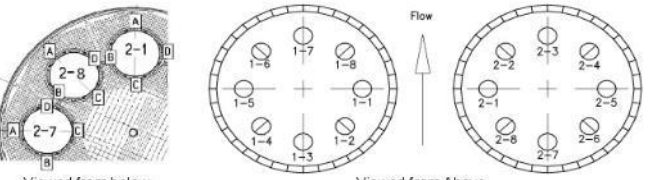
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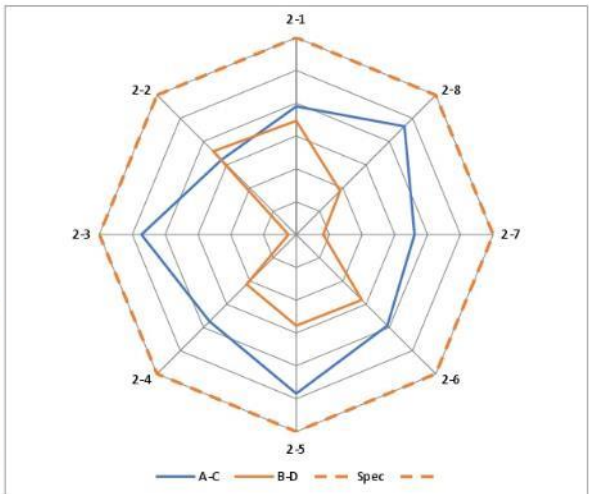
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Form No.: 240-94066774 Rev 0

 Disassembly	ESKOM GOURIKWA POWER STATION RHS CC Burner Alignment	Unit #: GT22
	Siemens SGT5-2000E Combustion	Checksheet Reference #: V94-2-2010-2 Page #: 1 of 2 Project #: GOU.MB
Relevant Procedures: 07. Disassembly of Combustion Chambers		




 Viewed from below


 Viewed from Above



Location	2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8
A	6.3	6.1	6.1	6.0	6.9	6.6	6.0	6.3
B	6.0	5.7	4.4	5.1	5.9	5.7	4.6	5.5
C	5.8	6.0	5.3	5.7	6.0	6.1	5.7	5.5
D	5.8	5.4	5.8	5.5	6.0	5.8	5.6	6.0
A-C	0.5	0.1	0.9	0.4	0.9	0.5	0.3	0.8
B-D	0.2	0.3	1.4	0.4	0.1	0.1	1.1	0.6

Spec	Max
Mis-alignment	1.5

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P. L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 24: CC2 alignment

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Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Hot Side Dome Plate RHS CC	Checksheet Reference #:	V94-2-2009-2
	Siemens SGT5-2000E	Page #:	1 of 2
	Combustion	Project #:	GOU.MB
Disassembly		Relevant Procedures:	03. Pre-disassembly inspections and measurements

Bottom plate Right
View in opposite flow direction

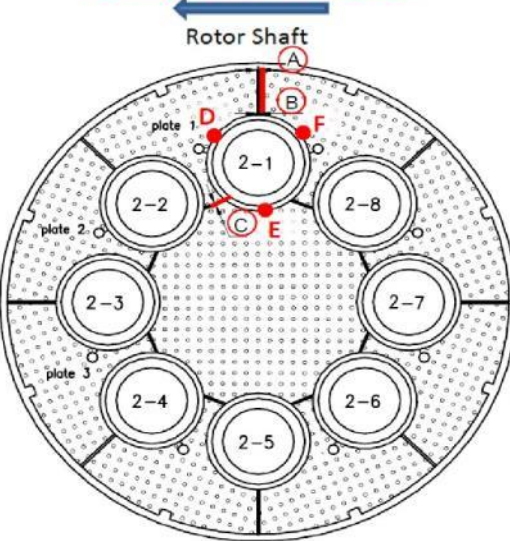




Plate	A	B	C	D	E	F
1	10.1	10.1	12.4	18.1	13.7	16.5
2	10.3	10.7	13.0	18.4	13.5	19.6
3	13.1	11.9	11.1	15.6	14.4	18.1
4	10.0	11.0	10.7	18.0	13.4	16.2
5	13.4	11.8	11.5	19.1	13.4	17.6
6	10.3	11.2	12.1	20.4	14.0	20.4
7	9.0	10.2	12.3	16.9	15.5	17.9
8	11.0	10.4	10.8	18.5	13.9	18.4

Remarks:

2-5 very out of position


Spec	Min	Max
A	8	12
B	8	12
C	8	12

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:	
PERFORMED BY - ARTISAN					
CHECKED BY - SUPERVISOR				M & TE NUMBER:	
CHECKED BY - QC				TECHNICAL NOTIFICATION:	
VERIFIED BY - TECHNICIAN					
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER	
NAME:		NAME:		NAME:	P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:	
DATE:		DATE:		DATE:	2022/10/11

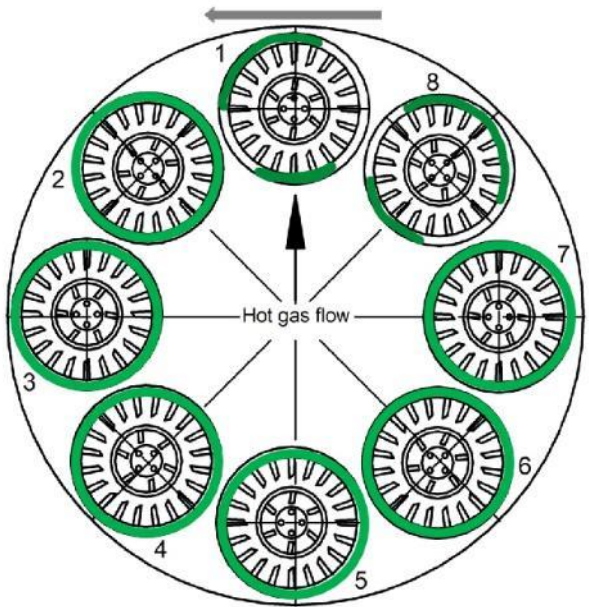
Check Sheet 25: CC2 dome plate clearances

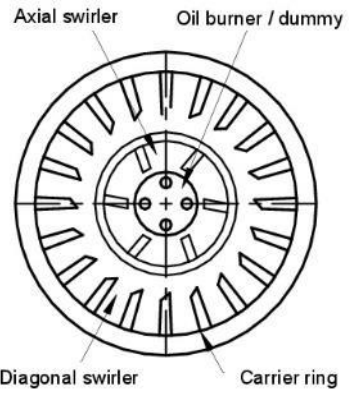
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	ESKOM GOURIKWA POWER STATION RHS CC Burner Assembly Visual Inspection	Unit #: GT22 Checksheet Reference #: V94-2-2012-2 Page #: 1 of 1 Project #: GOU.MI3
	Inspection Siemens SGT5-2000E Combustion	Relevant Procedures: 03. Pre-disassembly inspections and measurements



Rotor





Remarks: BIR Cracks: 2-2; 2-3; 2-4; 2-6; 2-7; 2-8


Key	
Corrosion	
	
	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Galana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/11

Check Sheet 26: CC2 burner assembly - VI

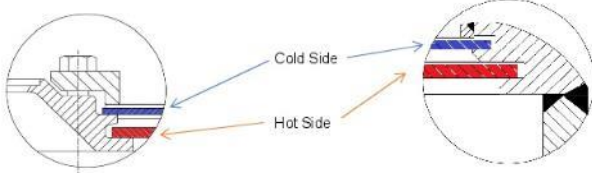
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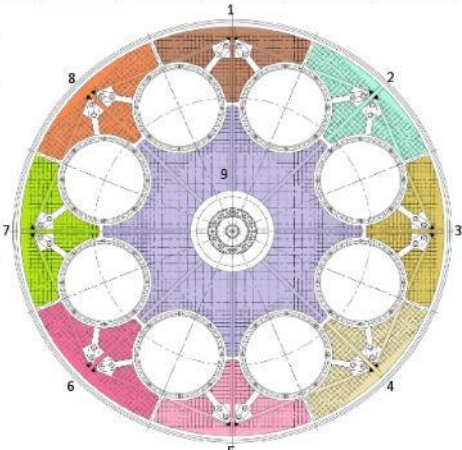
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	ESKOM GOURIKWA POWER STATION					Unit #: GT22	
	Dome Plates Visual Inspection					Checksheet Reference #: V94-2-2020	
Inspection	Siemens SGT5-2000E Combustion					Page #: 1 of 2	
						Project #: GOU.MB	
					Relevant Procedures: 15. NDT WI and 13. Inspection of CC		

Area	Inspection	Plate 1	Plate 2	Plate 3	Plate 4	Plate 5	Plate 6	Plate 7	Plate 8	Plate 9
LHS CC	Cold Side	Hammering Marks								
		Scaling								
		Cracks								
	Hot Side	Hammering Marks	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Scaling	No	No	No	No	No	No	No	No
		Cracks	No	No	No	No	No	No	No	No
RHS CC	Deformation	Yes	No	Yes	No	No	Yes	No	No	No
	Cold Side	Hammering Marks								
		Scaling								
		Cracks								
RHS CC	Hot Side	Hammering Marks	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Scaling	No	No	No	No	No	No	No	No
		Cracks	No	No	No	No	No	No	No	No
	Deformation	No	No	No	No	Yes	No	No	No	No

Inspection	Findings	Remarks
End Plate Material (Cold Side)	LHS	
	RHS	





RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/11	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/10/13

Check Sheet 27: Dome plates - VI

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Form No.: 240-94066774 Rev 0



Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

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	ESKOM GOURIKWA POWER STATION				Unit #:	GT22
	Diffusion Burners RHS Visual Inspections				Checksheet Reference #:	V94-2-2023-2
Inspection	Siemens SGT5-2000E Combustion				Page #:	1 of 1
					Project #:	GOU.MB
					Relevant Procedures:	13. Inspection of CC

Area	Inspection	Burner 2-1	Burner 2-2	Burner 2-3	Burner 2-4	Burner 2-5	Burner 2-6	Burner 2-7	Burner 2-8
Fuel Oil Lance	Discoloration	No	No	No	No	No	No	No	No
	Erosion *Boroscopic Inspection*								
	Seat								
	Scaling								
	Deposits								
	Discoloration								
Burner Needle	Signs of overheating								
	Cracks *Boroscopic Inspection*								
	Correct Installation *Boroscopic Inspection*								
Axial Swirlers	Deposits	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	Clogging of bores	No	No	No	No	No	No	No	No
	Deformation of Vanes	No	No	No	No	No	No	No	No
	Scaling	No	No	No	No	No	No	No	No
	Erosion	No	No	No	No	No	No	No	No
	Cracks	No	No	No	No	No	No	No	No
	Discoloration	No	No	Yes	Yes	No	No	No	No
Burner Support	Corrosion / Damage								
	Discoloration								
	Signs of Overheating								
	Cracks								
Igniter	Damage								
	Spark Test								
Thermo-couples	Damage								

Remarks: _____

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/13

Check Sheet 28: CC2 diffusion burner - VI

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Inspection Report
Gourikwa – GT22 Minor
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ESKOM GOURIKWA POWER STATION

Unit #:

GT22

Checksheet Reference #:

V94-2-2028

Page #:

2 of 3

Project #:

GOU.MB

Inspection

Siemens SGT5-2000E
Combustion

Relevant Procedures:

13. Inspection of CC

Area	Inspection	Burner 2-1	Burner 2-2	Burner 2-3	Burner 2-4	Burner 2-5	Burner 2-6	Burner 2-7	Burner 2-8
Nozzles	Deposits / Coking / Plugging	No	No	No	No	Yes	Yes	Yes	Yes
	Hub - Deposits / Coking	No	No	No	No	No	No	No	No
	Hub - Fit of Nozzles								
Diagonal Swirler Entire Surface	Deposits / Coking / Plugging	No	No	No	No	No	No	No	No
	Corrosion	No	No	No	No	No	No	No	No
	Deformation	No	No	No	No	No	No	No	No
	Material Break-out	No	No	No	No	No	No	No	No
	Hammering Marks to Burner Insert Ring								
	Hammering Marks to Axial Swirler								
	Tight fit of Vanes								
	Misalignment								
	Clogging of Premix Gas Nozzles								
	Signs of Overheating	No	No	No	No	No	No	No	No
Expansion Joint	Cracks	No	No	No	No	No	No	No	No
	Damage								
	Wear								
Hold-downs for Diagonal Swirler	Cracks								
	Tight fit								
Gas Distributor (Spider)	Corrosion								
	Cracks								
	Deposits								
"Boroscopic Inspection"									

Remarks: Blocked Nozzles: 2-5: All; 2-6: 2; 2-7: 1; 2-8: 2

Axial Swirlers(AS) Overheat(OH): 2-1: 12 2-5: 9 - Some white deposits on premix bell just after AS(2-2)

2-2: 9 2-6: 9 - 2-5 shiny, every single nozzle is plugged

2-3: 6 2-7: 9

2-4: 7 2-8: 7

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Galana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 29: CC2 premix burner - VI

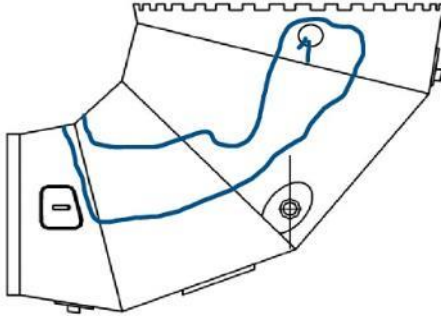
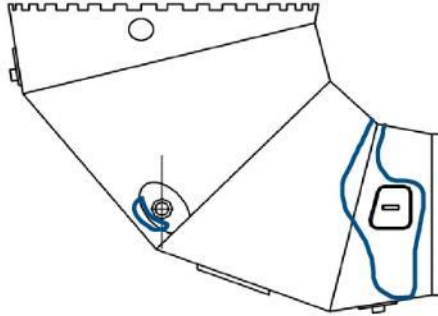
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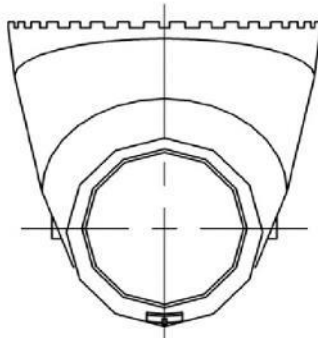
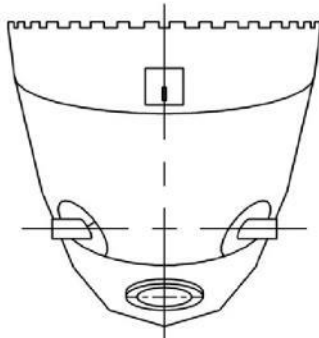
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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	LHS Mixing Chamber Visual Inspection	Checksheet Reference #:	V94-2-2011-1
		Page #:	1 of 3
		Project #:	GOU.MI3
Inspection	Siemens SGT5-2000E Combustion	Relevant Procedures:	15. NDT WI and 13. Inspection of CC






Remarks:

Key

	
Corrosion	
Cracks	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:	
PERFORMED BY - ARTISAN					
CHECKED BY - SUPERVISOR				M & TE NUMBER:	
CHECKED BY - QC				TECHNICAL NOTIFICATION:	
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:	
ERI ENGINEER	Greyling Moolman		2022/10/13		
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER	
NAME:		NAME:		NAME:	P.L. Galana
SIGNATURE:		SIGNATURE:		SIGNATURE:	
DATE:		DATE:		DATE:	2022/10/13

Check Sheet 30: CC1 MC - VI

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Business Management System
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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	LHS Mixing Chamber Visual Inspection	Checksheet Reference #:	V94-2-2011-1
Inspection	Siemens SGT5-2000E	Page #:	2 of 3
	Combustion	Project #:	GOU.MB
		Relevant Procedures:	27 Reassembly - CCs

Area	Inspection	Findings	Remarks
Complete Surface	Corrosion	Yes	
	Scaling	Yes	
	Mechanical Material Thinning	No	
	Cracks	Yes	CS inspection
	Deformation	No	
Reinforcement and Guide Plate Regions	Corrosion	Yes	TS
	Scaling	Yes	TS
	Mechanical Material Thinning	No	
	Cracks	Yes	TS
Castellations	Scoring Marks / Wear	Yes	5; 6-7; 8-1; 12-13; 13-14; 15-16; 16-17; 18-19; 20-21; 21-22; 23; 24; 26-29; 30
	Deformation	No	
Guides	LHS - Wear		
	Bottom - Wear		
	RHS - Wear		
Bushing Supports	LHS - Wear		
	RHS - Wear		
Cooling Air Ring	Wear / Hammering Marks	Yes	1-7; 9-13; 14-20
Manhole Insert	Mechanical Material thinning	No	
	Scaling	No	
Manhole Collar	Scaling	No	
	Cracks	Yes	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 31: CC1 MC - VI

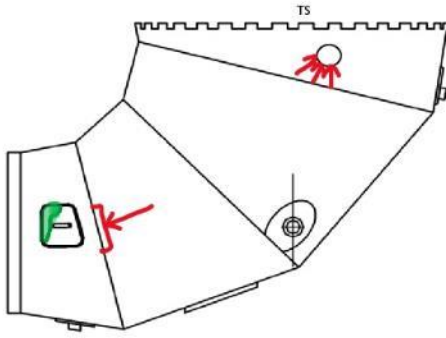
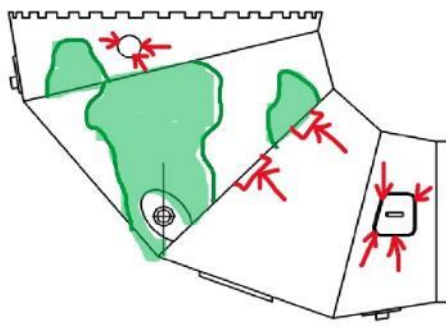
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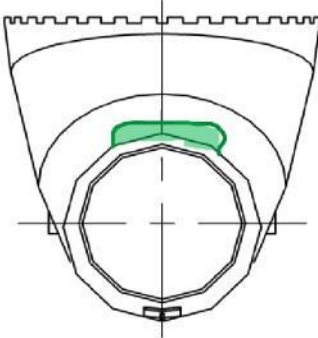
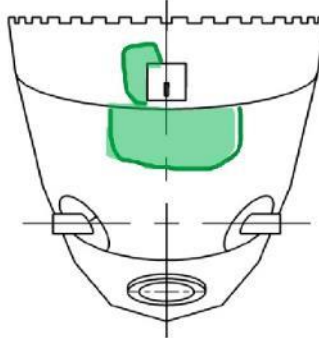
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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	RHS Mixing Chamber Inspection	Checksheet Reference #:	V94-2-2011-2
Inspection	Siemens SGT5-2000E	Page #:	1 of 3
	Combustion	Project #:	GOU.MI3
		Relevant Procedures:	15. NDT WI and 13. Inspection of CC

Remarks: _____

Key	
	
Corrosion	
Cracks	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/12	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/10/13

Check Sheet 32: CC2 MC - VI

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Gourikwa – GT22 Minor
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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	RHS Mixing Chamber Inspection	Checksheet Reference #:	V94-2-2011-2
Inspection	Siemens SGT5-2000E	Page #:	2 of 3
	Combustion	Project #:	GOU.MB
		Relevant Procedures:	27 Reassembly - CCs

Area	Inspection	Findings	Remarks
Complete Surface	Corrosion	Yes	
	Scaling	Yes	
	Mechanical Material Thinning	No	
	Cracks	Yes	→ Crack Areas: TS inspection port CS inspection port CW2 CW3 CS eccentric key
	Deformation	No	
Reinforcement and Guide Plate Regions	Corrosion	Yes	
	Scaling	Yes	
	Mechanical Material Thinning	No	
	Cracks	Yes	→ CS
Castellations	Scoring Marks / Wear	Yes	→ 9-10; 11; 12; 13; 14; 15; 16-20; 26-27
	Deformation	No	
Guides	LHS - Wear		
	Bottom - Wear		
	RHS - Wear		
Bushing Supports	LHS - Wear		
	RHS - Wear		
Cooling Air Ring	Wear / Hammering Marks	Yes	→ 7; 8; 9; 10-12; 13-16; 20-6
Manhole Insert	Mechanical Material thinning	No	
	Scaling	No	
Manhole Collar	Scaling	No	
	Cracks	No	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/12	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 33: CC2 MC - VI

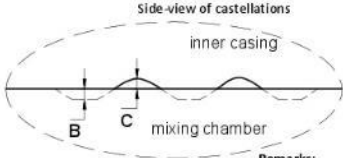
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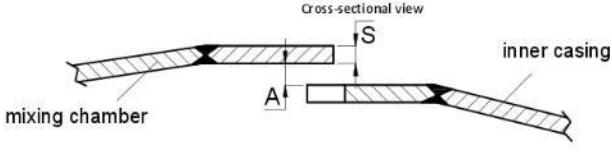
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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Mixing Chamber to Inner Casing Clearances	Checksheet Reference #:	V94-2-2005
		Page #:	1 of 2
		Project #:	GOU.MB
Disassembly	Siemens SGT5-2000E Combustion	Relevant Procedures:	03. Pre-disassembly inspections and measurements



Side-view of castellations

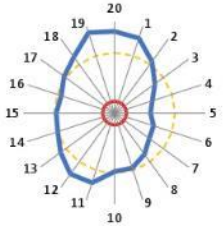


Cross-sectional view

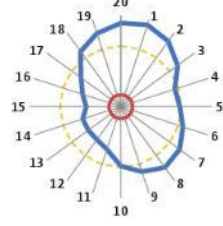
Remarks: _____

"A" = "A" + "S"

For B: Add 6.67mm (unless marked with a "A")





View in flow direction



View in flow direction

LHS CC					RHS CC				
Location	A	B	C	S	Location	A	B	C	S
1	21.6	11			1	23.6	11		
2	17.5	10			2	22.2	12		
3	13.6	12			3	19.2	14		
4	10.9	11			4	15.6	16		
5	9.9	13			5	16.2	15		
6	11.2	14			6	17.9	16		
7	11.8	10			7	19.9	15		
8	13.9	11			8	20.6	16		
9	15.8	11			9	18.7	18		
10	16.0	10			10	16.3	16		
11	20.1	10			11	12.3	13		
12	20.6	10			12	11.2	27		
13	18.3	11			13	11.0	16		
14	16.4	11			14	11.0	14		
15	16.0	15			15	9.5	13		
16	15.4	10			16	11.0	13		
17	17.1	11			17	13.5	10		
18	19.1	11			18	18.7	8		
19	23.2	10			19	21.1	9		
20	22.4	10			20	22.9	10		
Average	16.5	11.1			Average	16.6	14.1		

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		13/10/2022	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 34: MC to IC clearances

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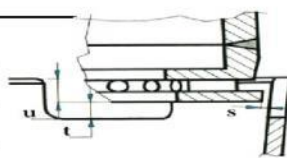
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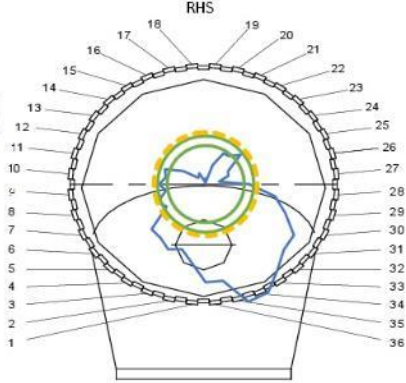
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	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Flame Tube Clearances		Checksheet Reference #:	V94-2-2008
Disassembly	Siemens SGT5-2000E Combustion		Page #:	1 of 2
			Project #:	GOU.MI3
			Relevant Procedures:	03. Pre-disassembly inspections and measurements

Remarks: _____



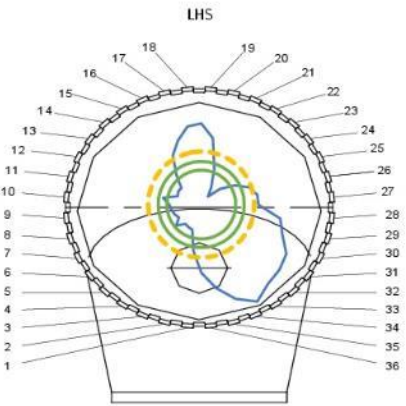
RHS





LHS			
Point	s	t	u
1	7.9	4	
2	5.4	4	
3	3.1	4	
4	3.0	5	
5	2.9	6	
6	3.8	6	
7	3.0	7	
8	3.3	7	
9	3.5	7	
10	3.7	8	
11	4.5	8	
12	2.9	9	
13	3.1	8	
14	3.0	9	
15	4.5	9	
16	6.6	9	
17	7.9	8	
18	9.2	8	
19	9.4	8	
20	7.8	8	
21	4.4	9	
22	2.3	7	
23	1.2	8	
24	2.8	7	
25	4.5	7	
26	5.9	6	
27	6.6	6	
28	6.6	5	
29	9.3	4	
30	10.0	4	
31	11.4	4	
32	11.8	3	
33	12.0	2	
34	13.0	2	
35	11.6	2	
36	9.8	1	
Ave	6.2	6.1	

RHS			
Point	s	t	u
1	10.2	6	
2	8.3	6	
3	7.2	7	
4	7.8	9	
5	7.3	10	
6	7.3	11	
7	4.7	11	
8	5.3	11	
9	4.2	10	
10	4.8	10	
11	4.2	11	
12	4.5	12	
13	2.7	11	
14	1.0	11	
15	1.1	9	
16	1.3	8	
17	0.2	7	
18	0.0	7	
19	0.6	5	
20	0.4	4	
21	2.1	5	
22	3.7	4	
23	3.8	5	
24	4.7	7	
25	2.7	8	
26	2.5	9	
27	1.4	6	
28	4.5	7	
29	7.3	9	
30	8.8	10	
31	10.6	9	
32	10.6	9	
33	11.6	9	
34	13.0	8	
35	13.0	8	
36	10.2	9	
Ave	5.4	8	

LHS



Specification	Min	Max
Radial Clearance s	4	5
t	8	9
Nominal		
Overlap u	30	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/13	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/10/13

Check Sheet 35: FT to MC clearances

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

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	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Inner Casing Visual Inspection	Checksheet Reference #:	V94-2-2805
Inspection	Siemens SGT5-2000E	Page #:	1 of 3
	Combustion	Project #:	GOU.MB
		Relevant Procedures:	22. Inspection - Inner Casing

Area	Inspection	Findings	Remarks
Support Paws (4 off)	Mechanical Material Thinning (towards shim)	No	
	Mechanical Material Thinning (towards hold-down)	No	
Hold-downs (4 off)	Mechanical Material Thinning	No	
Hold-down shims (4 off)	Mechanical Material Thinning	No	
Center Guide	Mechanical Material Thinning	No	
Surface	Corrosion	Yes	
	Scaling	Yes	
	Mechanical Material Thinning	No	
	Dents / Bulges	No	
	Cracks (Isolated)	Yes	
	Net of Cracks	No	
	Spalling of TBC	Yes	
Inlet Shell	Scaling / Erosion		
	Cracks		
	Mechanical Material Thinning At Shrink-fit Connection		
Anti-rotation Pin	Mechanical Material Thinning		
	Fracture / Cracks		
K-ring Guide	Mechanical Material Thinning		
	Cracks		
Cooling Air Ring Guide Rib	Mechanical Material Thinning	Yes	Marked on mixing chamber protocol
	Cracks	No	
Clamping Bolt for Protective Liner and Flow Baffle	Wear		
	Thermal Stress Cracks On Transition Radius of Bolt		
	Cracks in other Locations		

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/13	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/10/13


Check Sheet 36: IC VI

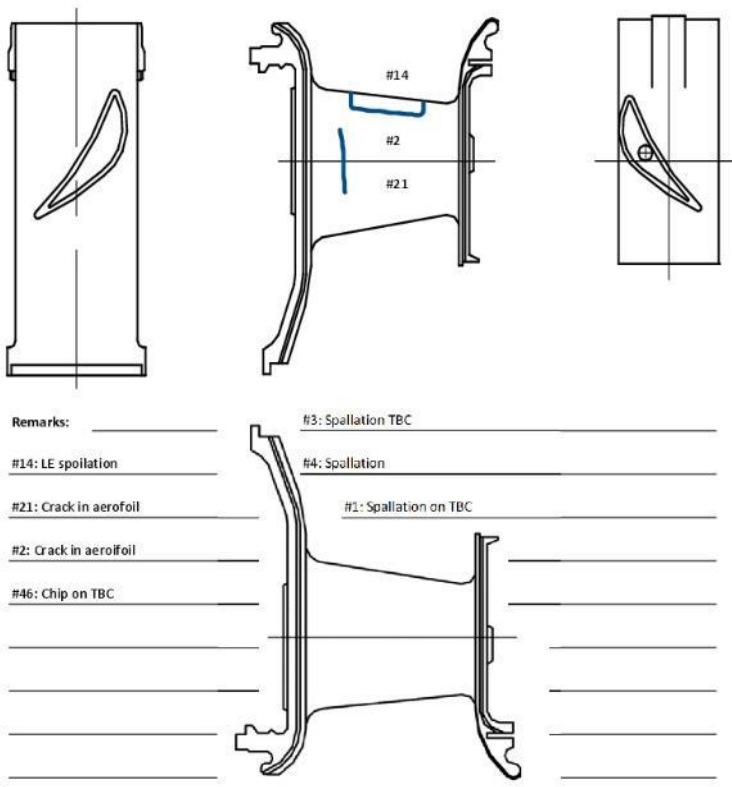
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Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Stage 1 Vanes Visual Inspection		Checksheet Reference #:	V94-2-3005-1
			Page #:	2 of 6
			Project #:	GOU.MI3
Inspection	Siemens SGT5-2000E Turbine		Relevant Procedures:	26. Reassembly - Turbine Stator Vane WI



Remarks:

#14: LE spoilation

#21: Crack in aerofoil

#2: Crack in aerofoil




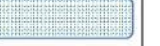


#46: Chip on TBC



#3: Spallation TBC

#4: Spallation

#1: Spallation on TBC

Damage Type	Counts	
Outer Shroud	Wear or Cracks on Groove for Anti-rotation Pin	
	Wear or Cracks on Fitting Surface	
	Wear or Cracks on Groove for Seals	
	Overheating	
	Rubbing Marks	
	Cracks	
	Deformation	
	Coating Abrasion / Thinning	
	Mechanical Material Thinning	
Airfoil	Cracks	
	FOD	
	Break Out	
	Overheating	
	Corrosion / Erosion	
	Deformation of Trailing Edge	
	Coating Abrasion / Thinning	
Inner Shroud	Wear or Cracks on Groove for Seals	
	Cracks	
	Axial Rubbing Marks	
	Overheating	
	Coating Abrasion / Thinning	
	Wear or Cracks on Circumferential Seal	
	Deformation	
Mechanical Material Thinning		

Key			
FOD		Cracks	
Wear		Over-heating	
Damage due to disass		Corrosion	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/12	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/10/13


Check Sheet 37: TLe1 - VI

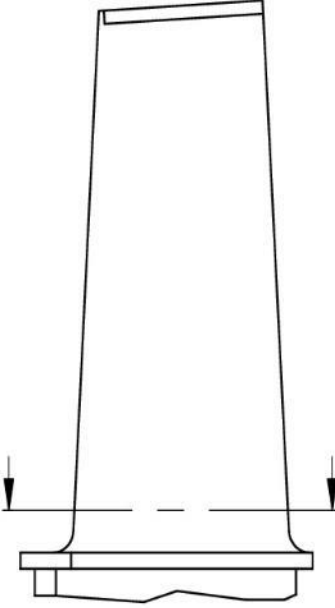
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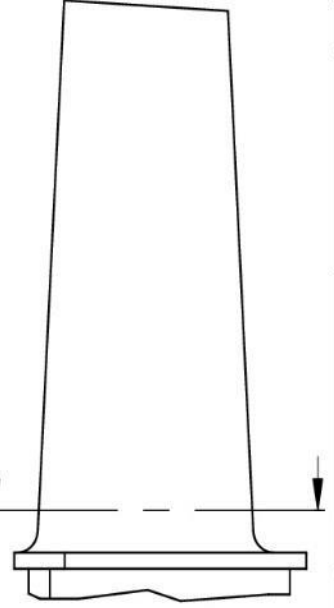
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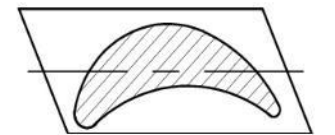
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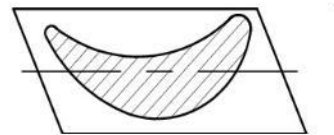
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	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Stage 1 Blades Visual Inspection		Checksheet Reference #:	V94-2-3802-1
	Siemens SGT5-2000E Turbine		Page #:	2 of 7
	Inspection		Project #:	GOU.MI3
			Relevant Procedures:	33. Inspection- Turbine Inspections

















Damage Type		Counts
Blade Tip	Cracks	
	Rubbing	
	Oxidation	
	Deformation	
	Break-out	
Airfoil and Platform	Deposits	
	Cracks	
	Coating Thinning	
	Overheating	
	FOD	
	Break-out	
Root	Corrosion / Erosion	
	Wear	
	Damage	

Key			
FOD		Cracks	
TBC Spallation		Over-heating	
Damage due to disass		Corrosion	

Remarks: No anomalies / No findings

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/12	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	NAME: P.L. Calana	
SIGNATURE:		SIGNATURE:	SIGNATURE: 	
DATE:	Log #:	DATE:	DATE: 2022/10/12	


Check Sheet 38: TLa1 - VI

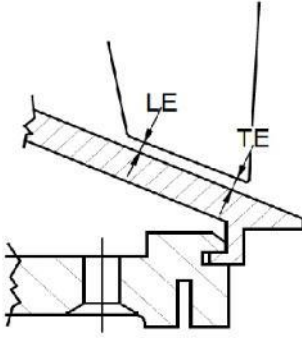
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Form No.: 240-94066774 Rev 0

 Disassembly	ESKOM GOURIKWA POWER STATION		Unit #:	GT22
	Turbine Radial Blade Tip Clearances		Checksheet Reference #:	V94-2-6301
	Siemens SGT5-2000E Centreline		Page #:	1 of 2
			Project #:	GOU.MB
		Relevant Procedures:	03. Pre-disassembly inspections and measurements	


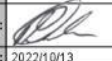


Note: Values determined at minimum clearance for each measuring point using a feeler gauge

Stage 1		Stage 4		Stage 1		Stage 4	
5.3	4.7	5.7	0.2	6.6	6.9	7.3	0.1
5.3	4.6	5.0	0.5	6.7	6.8	7.3	0.5
Δs	0.1	5.5	0.1	6.6	6.7	7.4	7.8
0.3	4.3	4.5	0.1	6.3	6.5	7.4	7.8
		Theo-Centre LE 0.28 -0.18 TE 0.05 -0.15				Theo-Centre LE -0.15 -0.35 TE -0.2 -0.4	

Remarks:

Specifications	E1LE		E1TE		E4LE		E4TE	
	Min	Max	Min	Max	Min	Max	Min	Max
Nominal	5.2	5.7	4.2	4.7	6.9	7.7	7.2	8.0
Δs		0.1		0.1		0.1		0.1

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Greyling Moolman		2022/10/13	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/13

Check Sheet 39: TLa1 & TLa4 radial blade tip clearances

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

Document Identifier	195/454	Rev	0
Date	30/01/2023		
Page	98 of 101		

		ESKOM GOURIKWA POWER STATION		Unit #:	GT22
		Exhaust Casing Inspections		Checksheet Reference #:	V94-2-5002
				Page #:	1 of 1
				Project #:	GOU.MB
Inspection		Siemens SGT5-2000E Exhaust		Relevant Procedures:	15.101.101 and 03.101.101 - pre-disassembly and 33.101.101 - Turbine inspection

Area	Sub-Area	Inspection	Findings	Remarks
Casing Lining	Inside Wall Surface	Deposits	No	
		Deformation / Dents	No	
		Foreign Object Impact	No	
		Cracks	Yes	
	Transition to Hub	Wear	Yes	NDE Report Number
	Weld Beads	PT - Upper Half		
		PT - Bottom Half		
	Radial Displacement relative to TB4 Root Plate	Offset (Radial, Inward or Outward)		
Exhaust Diffuser	Cover Plate for Expansion Joint	Scuffing Marks	Yes	
		Lack of Overlap	No	
		Cracks	Yes	
		Deformation / Dents	No	
		Weld Bead - Cracks	Yes	
	Expansion Joint	Cracks		Boroscopic Inspection
Exhaust Casing	Horizontal Joint Faces	Scoring Marks		Significant cracking at 03:00 and 09:00 weld
		Marks indicating that Hot Air has Escaped		Material breakout at both locations. Plate requirement and weld repair required
		Gapping (Horizontal / Vertical)		
	Partion Plate to TVC	Mechanical Material Thinning		
	Vertical Flange	Galling Marks		
Hub Cover Plate	Sheet Metal Jacketing	Scuffing Marks / Wear	Yes	
	Weld Beads	Cracks	Yes	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	P.L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:	2022/10/12	

Check Sheet 40: Exhaust casing - VI

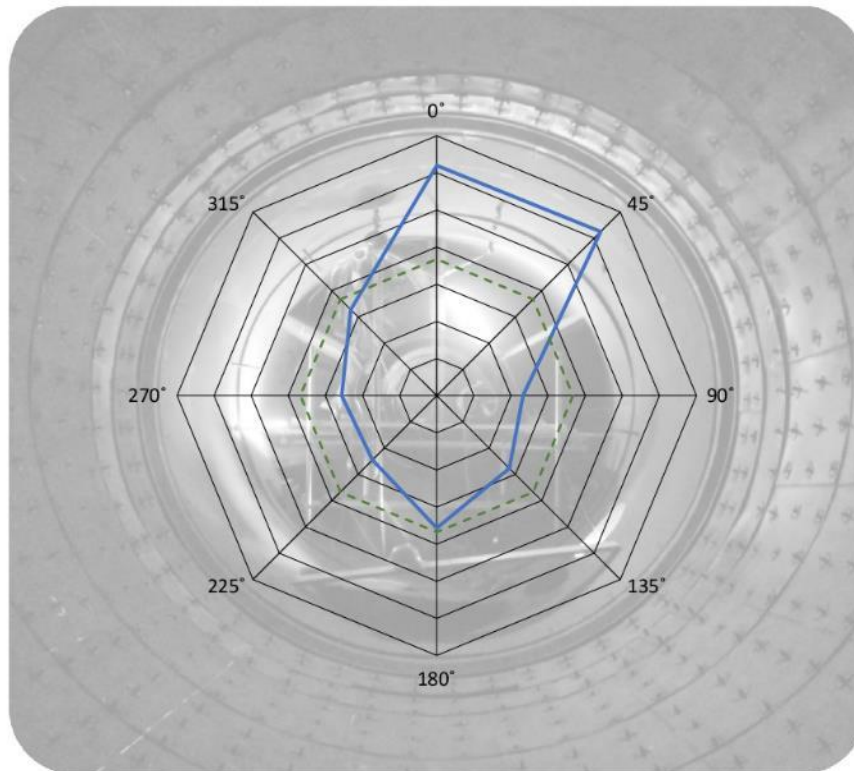
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Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Casing to Cover Plate Measurements	Checksheet Reference #:	V94-2-5003
		Page #:	1 of 1
		Project #:	GOU.MB
Inspection	Siemens SGT5-2000E Exhaust	Relevant Procedures:	05. Disassembly of GT Body - Work Instruction



Gap between Exhaust Casing and Cover Plate for Expansion Joint								
0°	45°	90°	135°	180°	225°	270°	315°	Average
31.0	31.25	11.62	13.82	17.85	12.25	12.8	16.38	18.4

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/12

Check Sheet 41: Exhaust casing to cover plate clearances

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Business Management System
Inspection Report
Gourikwa – GT22 Minor
Inspection

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195/454

Rev

0

Date

30/01/2023

Page

100 of 101



ESKOM GOURIKWA POWER STATION

Unit #:

GT22

Downstream of Exhaust Casing
Inspections

Checksheet Reference #:

V94-2-5004

Page #:

1 of 1

Project #:

GOU.MB

Inspection

Siemens SGT5-2000E
Exhaust

Relevant Procedures:

33. Inspection -Turbine Inspections

Area	Sub-Area	Inspection	Findings	Remarks
Exhaust Diffuser	Surface of Inside Walls	Deformation / Dents	No	Exhaust entry door cushion worn/damaged - debris lying around
		Foreign Object Impact	No	Recommend replace
		Cracks	Yes	
	Weld Beads	Cracks	Yes	
	Manhole Contact Surfaces	Scoring Marks	No	
	Cover Plate for Expansion Joint	Scuffing Marks	No	
Thermocouples		Cracks	Yes	
		Corrosion	Yes	
		Loosened / Detached	No	
		Cracks (Weld beads at screw-in head)	No	
		Damage	No	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	P.L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:	2022/10/12	


Check Sheet 42: Downstream of exhaust casing - VI

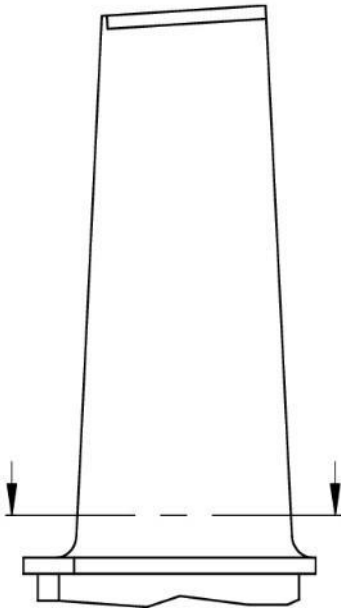
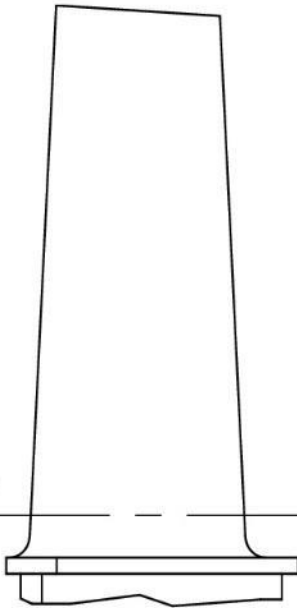
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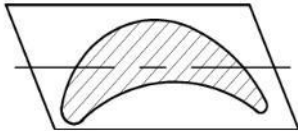
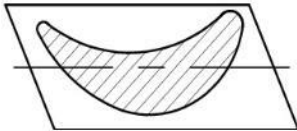
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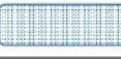

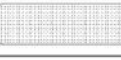
Form No.: 240-94066774 Rev 0

	ESKOM GOURIKWA POWER STATION	Unit #:	GT22
	Stage 4 Blades Visual Inspection	Checksheet Reference #:	V94-2-3802-4
Inspection	Siemens SGT5-2000E Turbine	Page #:	2 of 6
		Project #:	GOU.MI3
		Relevant Procedures:	33. Inspection- Turbine Inspections






Damage Type		Counts
Blade Tip	Cracks	
	Rubbing	
	Oxidation	
	Deformation	
	Break-out	
Airfoil and Platform	Deposits	
	Cracks	
	Coating Thinning	
	Overheating	
	FOD	
	Break-out	
	Corrosion / Erosion	
Root	Wear	
	Damage	

Key			
FOD		Cracks	
Wear		Over-heating	
Damage due to disass		Corrosion	

Remarks: _____

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Greyling Moolman		2022/10/11	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/10/12

Check Sheet 43: LTa4 - VI

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