



**Business Management System**  
Inspection Report  
Gourikwa – GT12 Minor  
Inspection

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<b>Document Type</b>	Inspection Report
<b>Outage ID</b>	23480
<b>Scope of Activity</b>	GT12 Minor Inspection at Gourikwa Peaking OCGT
<b>Purpose</b>	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
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J Otto Design Engineer		2021/01/23

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

Accepted		
Name/Designation	Signature	Date
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## SUMMARY

Gourikwa GT12 was removed from service on 12 September 2022 at 06:19 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 September 13<sup>th</sup> until September 16<sup>th</sup>. Areas inspected included: Filter house, Compressor Inlet, Compressor Exhaust, Combustion Chambers, Turbine Inlet and the Turbine Exhaust.

## LIST OF ABBREVIATIONS

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

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## UNIT INFORMATION

Date	Starts	Operating Hours	EOH	DOH
2022/09/12	2346	13693	37583	369
Turbine Serial	Turbine Frame	Fuel(s)	Generator Serial	Generator Frame
800632	SGT5-2000E(6)	Fuel Oil	12008154	SGEN5-100A-2P 115/36

## REFERENCES

1. Normative
  - a. Gas Turbine Minor Inspection Checklist: 3.5-0236-9420
  - b. Siemens SGT5-2000E 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	Significant 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
5.2.2.2	All nozzles on burner 2-6 were found to have been blocked.	Blockages cleared by site. Site to prepare contingency to replace premix spacer during the next MI.
6.1	Several vanes noted with flaked TBC. Additionally, 1 off vane was with visible cracks in the MCrAlY was noted.	MCrAlY coloration to be monitored to determine oxidation resistance. Crack progression to be monitored during the next MI – no action to be taken yet.
6.1	Flaking of TBC noted on several 1 <sup>st</sup> stage blades	No action – monitor at next MI
7	Numerous cracks noted downstream of the turbine outlet; internal cladding and expansion joint cover plates	Weld repairs executed.

## 2 EXTERNAL INSPECTIONS

### 2.1 General

Finding(s):

1. General corrosion on cladding noted.
2. Cladding is filthy.
3. Structure has several areas of heavy corrosion.
4. Leak noted in the turbine hall roof.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI.
2. Housekeeping to be improved.
3. Corrosion analysis and intervention plan required.
4. Site to address.

### 2.2 Ignition Gas

No anomalies noted

### 2.3 Control Oil Skid

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Finding(s):

1. Dirt on skid
2. Moderate oil on skid

Corrective Measure(s):

1. Site to clean skid.

## 2.4 Fuel Oil Skid

Finding(s):

1. Some oil noted on skid.
2. DO supply line not correctly supported<sup>1</sup>.
3. Plugs not installed at commissioning points<sup>2</sup>.
4. 12MBN17AA371 broken.

Corrective Measure(s):

1. Site to clean skid and report any leaks if noted.
2. Site to correct supports.
3. Site to adhere to FME standards and install plugs.
4. Site to replace valve handle.

## 2.5 Lubricating Oil and Jacking Oil Skid

Finding(s):

1. Moderate oil noted on skid; specifically near the coolers, mist separators and jacking oil pumps.
2. Line to generator on gen gall side is not adequately supported.

Corrective Measure(s):

1. Site to clean skid, and to report any leaks.
2. Site to rectify pipe supports.

## 2.6 Turbine

Finding(s):

1. CC drain line pipes overheated and discoloured.
2. White residue and corrosion observed on the 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.

---

<sup>1</sup> This is a repeat finding.

<sup>2</sup> This is a repeat finding.

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

## 2.7 Combustion Chambers

Finding(s):

1. White residue on outside cladding.
2. Dome rubber out of position.
3. RHS ΔP line is unsupported<sup>3</sup>.
4. LHS tags that are damaged / loose: 12MBM12CT101, 12MBM12CT102, 12MBM12CT109.
5. Seepage noted from premix bellows 1-3 and 2-8.
6. Cabling running along combustion chamber bridge loose.

Corrective Measure(s):

1. White residue on cladding was caused by water from the leaking roof.
2. Site to ensure the rubber adequately protects the dome cladding from being a risk of scratching / cutting.
3. Site to ensure adequate supports are installed for the pipework.
4. Site to replace tags<sup>4</sup>.
5. To be monitored – no immediate intervention required.
6. Site to provide adequate support.

## 2.8 Generator

Finding(s):

1. Old oil noted near the bearings.

Corrective Measure(s):

1. No intervention required.

## 3 AIR INTAKE SYSTEM

### 3.1 Filter House

Finding(s):

1. Heavy corrosion noted on structure.
2. Several severely damaged drainpipe clamps.
3. Coalescing filters dirty and sagging.
4. Clean room door locking mechanism non-existent<sup>5</sup>.

---

<sup>3</sup> This is a repeat finding.

<sup>4</sup> This is a repeat finding

<sup>5</sup> This is a repeat finding. Notification 25226389 was raised according to 194/688 – however the repairs were not executed. This poses a significant risk of FOD, as well as contamination of the clean room.

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5. Some filters noted with minor damage.
6. One off popped filter noted.
7. Significant corrosion noted in the filter clean room<sup>6</sup>. Blooming of corrosion also observed – floor integrity may become compromised in various locations should site not intervene.
8. Debris and water noted in the filter clean room.
9. Light test indicated inadequate sealing near 1 off filter, and indicated a pinhole in the structure above the door.
10. Seal strips loose on 2 off doors.

**Corrective Measure(s):**

1. Corrosion evaluation to be performed.
2. Site to repair / replace damaged drainpipe clamps – ensure that a material with adequate corrosion resistance is used.
3. Coalescing filters replaced.
4. Site to repair dysfunctional locks and ensure that the door seals adequately.
5. No remedial action required – to be monitored during the next MI.
6. Replaced by site.
7. Corrosion protection to be applied and the affected areas are to be re-painted.
8. Site to clean. Site to investigate during a rainy day in order to determine if a leak is present. Additionally sit to ensure that the Compressor inlet Munters dryer is running when required so that the moisture does not affect compressor components.
9. Filter was removed and re-installed. Site to schedule intervention to repair structure.
10. Site to rectify – and replace if necessary.

### 3.2 Compressor Inlet

**Finding(s):**

1. Compressor air inlet cone gasket incomplete with signs of ingress (historic).
2. Compressor air inlet cone gasket saturated with oil.
3. Possible signs of rubbing of air inlet flap noted (historic).
4. General flaking of paint noted in the inlet area.
5. Intake cone dirty.
6. Bottom locking handle has too much play.

**Corrective Measure(s):**

1. Compressor air inlet gasket to be replaced at the next MO.
2. Possibly indicative of a leak – to be monitored during the next MI.

---

<sup>6</sup> This is a repeat finding – no evidence of intervention since the previous minor was noted.

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3. Historic – no effect on operation observed.
4. Corrosion protection to be applied, and the affected areas are to be re-painted.
5. Site to clean.
6. Site to bend handle / locking plate to ensure that the door seals adequately.

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

### 4.2 Exhaust Diffusor

No anomalies noted.

## 5 COMBUSTION

### 5.1 LHS CC

#### 5.1.1 Sight Glasses

Finding(s):

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

Corrective Measure(s):

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

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### 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.
2. Cracks noted on the axial swirlers of burner 1-6.

#### Corrective Measure(s):

1. Coking cleaned during MI.
2. To be monitored during the next MI. Site to plan for the refurbishment of axial swirlers during the next MO.

### 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 all diagonal swirler outlet cones.
4. Blocked nozzles noted on burner 1-3.

#### 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. Blockages were cleared by site.

### 5.1.2.3 Ceramic Heat Shields

#### Finding(s)<sup>7</sup>:

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

### 5.1.2.4 Dome Plates & Burner Inserts

#### Finding(s):

---

<sup>7</sup> Tolerable limits as defined in: 37-1345-52KE00-DE-2013-12-003|004|005|006|007

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1. Minor signs of fretting noted between dome plates and burner inserts.
2. Cracks noted on all burner insert rings. Mechanical damage on BIR 1-1 was also observed.
3. Deformation noted of plates 1-1, 1-3 and 1-4.

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 action 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 7-8, 11, 12-21, 22-26, 27-28, 31, 32-33, 35, 36-1}.
2. Average “t” between the FT and MC is below specification.
3. Average “s” between FT and MC is below specification.
4. Hammering noted between Mixing Chamber and Inner Casing {at IC castellations 1-5, 6-11, 12, 13-17, 18, 19, 20}.
5. Slight rubbing of manhole insert at collar noted.
6. Clearance “B” between MC and IC below specification.

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

**5.2 RHS CC**

5.2.1 Sight Glasses

Finding(s):

1. Manhole sight glass dirty.

Corrective Measure(s):

1. 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.

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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

Finding(s):

1. Coking noted on all burner caps and several axial swirlers.
2. Erosion noted on the axial swirler outlet bell of burner 2-2, 2-3 and 2-7.
3. Cracks noted on the axial swirlers of burner 2-4.

Corrective Measure(s):

1. Coking cleaned during MI.
2. No remedial action required – to be monitored during the next MI.
3. To be monitored during the next MI. Site to plan for the refurbishment of axial swirlers during the next MO.

#### 5.2.2.2 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 all diagonal swirler outlet cones.
4. Significant overheating on the premix bell of burners 2-2, 2-3, 2-4, 2-6 and 2-8 resulting in missing material and cracks.
5. Blocked nozzles noted on burners 2-5, 2-6 and 2-7.
6. Alignment of burner 2-4 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. To be monitored during the next MI.
5. Blockages cleared by site.
  - a. **All** nozzles on 2-6 were blocked. Should this be visible during an interim inspection, or during the next MI – site must replace the copper spacer in the premix line during the MI. This should be planned for as a contingency. Site to ensure that machining facilities are available should the spacer dimensions require modification.
6. To be monitored during the next MI.

#### 5.2.2.3 Ceramic Heat Shields

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Finding(s)<sup>8</sup>:

1. Tiles near burner 2-6 were noted to be red – indicating that they were not exposed to standard heat.

Corrective Measure(s):

1. Refer to 5.2.2.2 – lack of heat due to all premix nozzles having been blocked.

#### 5.2.2.4 Dome Plates & Burner Inserts

Finding(s):

1. Minor signs of fretting noted between dome plates and burner inserts.
2. BIR cracks noted on all burners.

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.

#### 5.2.3 Mixing Chamber

Finding(s):

2. Hammering noted between Flame Tube and Mixing Chamber {at castellations 1, 2, 3, 4-8, 12, 15-20, 31-35}.
3. Average “t” between the FT and MC is below specification.
4. Average “s” between the FT and MC is below specification.
5. Hammering noted between Mixing Chamber and Inner Casing {at IC castellations 6, 7-8, 9-10, 11, 16-4}.
6. Clearance “B” between MC and IC is below specification.

Corrective Measure(s):

2. No remedial action required – to be monitored during the next MI.
3. No significant variation determined when compared to the previous MI. 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 MI.
6. No significant variation determined when compared to the previous MI. No remedial action required – to be monitored during the next MI.

### 5.3 Inner Casing

Finding(s):

1. There were no findings on the TBC of the IC hub, and no coating spallation was observed.
2. Some corrosion was noted on the IC walls (CC1).

Corrective Measure(s):

<sup>8</sup> 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.
2. No remedial action required – to be monitored during the next MI.

## 6 TURBINE

### 6.1 Inlet

Finding(s):

1. Minor flaking of TBC on vanes #1, #2, #26 and #32 observed.
2. Crack in MCrAlY of vane #6 noted (TBC flaked off in the area).
3. Minor flaking of TBC on some TLa1 blades observed.
4. Almost all LE radial blade tip clearances were measured to be tight.

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.

### 6.2 Outlet

Finding(s):

1. Most radial blade tip clearances were measured to be tight – however there were no visible signs of rubbing.

Corrective Measure(s):

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

## 7 EXHAUST

Finding(s):

1. Cracks indications noted in several areas of the exhaust casing, expansion joint plates and turbine bearing hub. Significant crack noted on LHS of exhaust casing.
2. Wear noted on turbine bearing hub cover plate, 1<sup>st</sup> and 2<sup>nd</sup> expansion joint plates.
3. Drain line loose.
4. Exhaust cushion damaged and inadequately affixed.

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 weld-repair
4. Site to replace cushion and ensure correct installation.

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## 8 ACKNOWLEDGEMENTS

- Hadley Siebritz operations & maintenance senior supervisor, and his team for assisting with opening and closing the gas turbine access manholes

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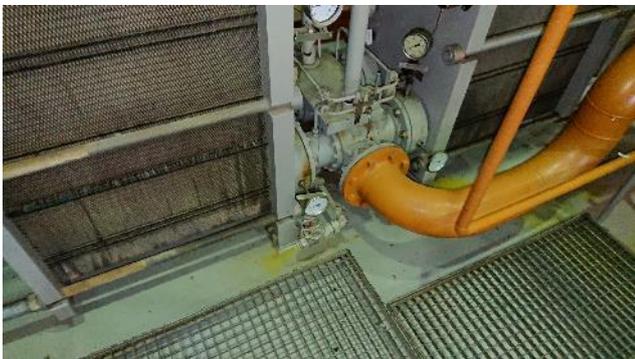
**APPENDIX A**



**Figure 1: Lubricating oil skid**



**Figure 5:**



**Figure 2: Lubricating oil skid**



**Figure 6: Lubricating oil skid**



**Figure 3: Lubricating oil skid**



**Figure 7: Control oil skid**



**Figure 4: Lubricating oil skid**



**Figure 8: Incorrect pipe support**

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**Figure 9: Loose pipe support**



**Figure 13: Fuel oil skid**



**Figure 10: Fuel oil skid**



**Figure 14: Fuel oil skid**



**Figure 11: Fuel oil skid**



**Figure 15: Fuel oil skid**



**Figure 12: Fuel oil skid**



**Figure 16: Fuel oil skid**

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**Figure 17: Fuel oil skid**



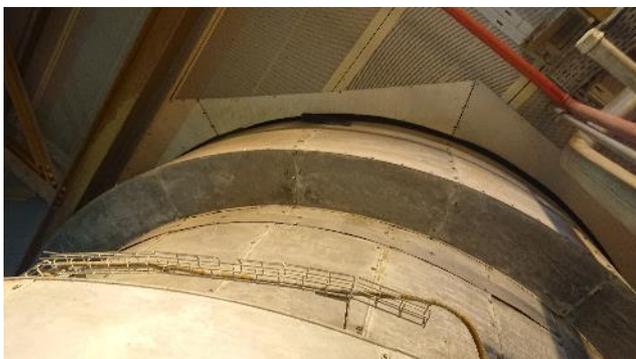
**Figure 21: Cladding**



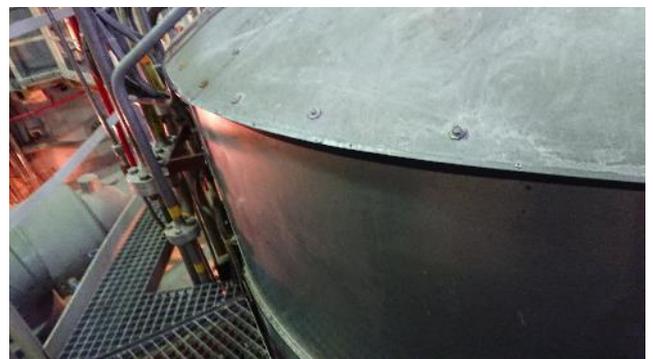
**Figure 18: Cladding**



**Figure 22: Resonating pipework**



**Figure 19: Cladding**



**Figure 23: Dome cladding**



**Figure 20: Cladding**



**Figure 24: Dome - VI**

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**Figure 25: Dome - VI**



**Figure 29: Loose cabling**



**Figure 26: Burners**



**Figure 30: Cladding**



**Figure 27: Dome Cladding**



**Figure 31: Generator EE bearing**



**Figure 28: Cladding**



**Figure 32: Exciter**

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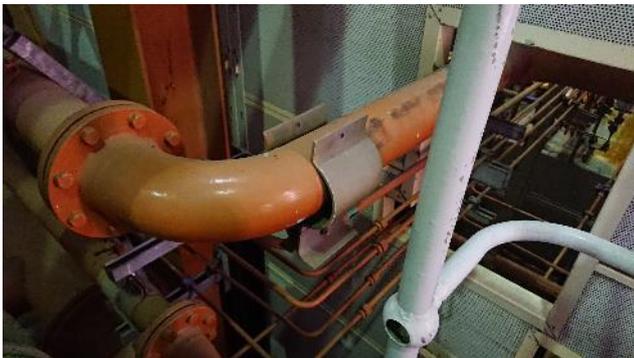
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**Figure 33: Structure**



**Figure 37: Pre-filters**



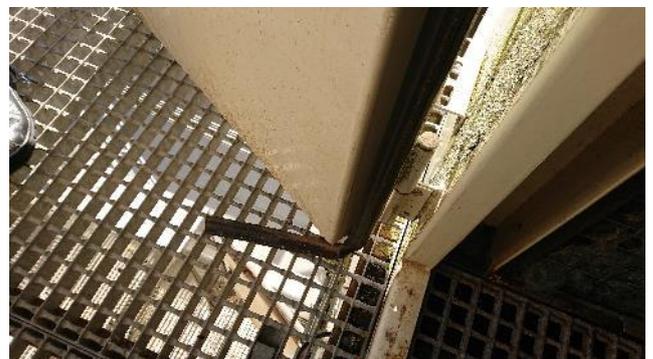
**Figure 34: Poorly supported pipe**



**Figure 38: Coalescing filters**



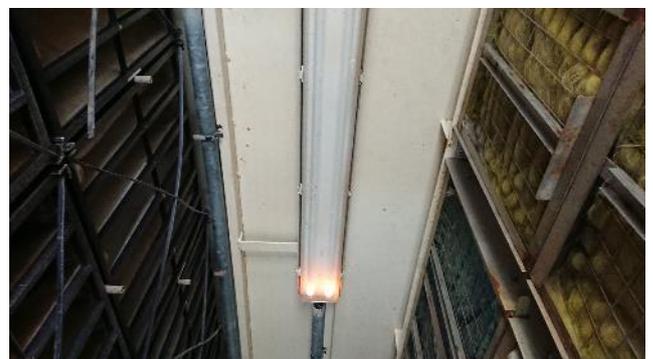
**Figure 35: Coalescing filters**



**Figure 39: Loose door seal**



**Figure 36: Pre-filters**



**Figure 40: Lights to replace**

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Figure 41: Coalescing filters



Figure 45: Corroded drain support



Figure 42: Coalescing filters

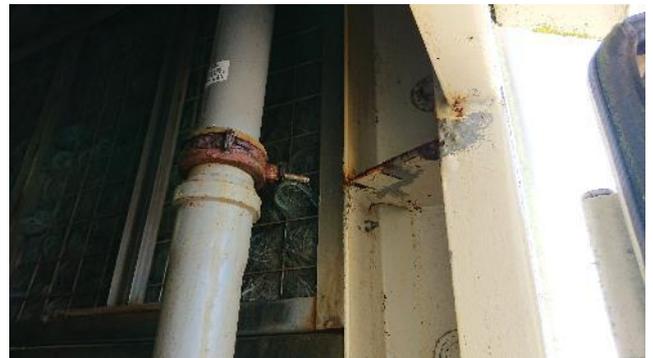


Figure 46: Corroded drain support



Figure 43: Loose door seal



Figure 47: Corroded drain support

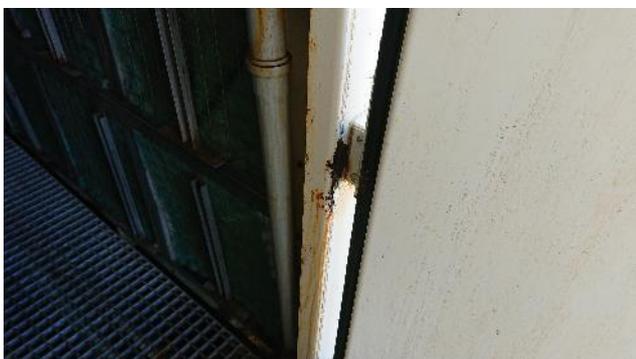


Figure 44: Filter house - corrosion



Figure 48: Filter house - corrosion

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**Figure 49: Filter house - corrosion**



**Figure 53: Clean room door**



**Figure 50: Corroded drain support**



**Figure 54: Clean room**



**Figure 51: Filter house - corrosion**



**Figure 55: Clean room**



**Figure 52: Clean room door**



**Figure 56: Clean room**

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Figure 57: Clean room

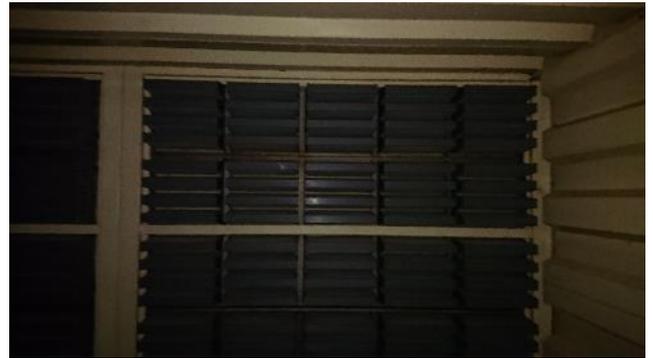


Figure 61: Clean room



Figure 58: Clean room



Figure 62: Clean room



Figure 59: Clean room



Figure 63: Clean room

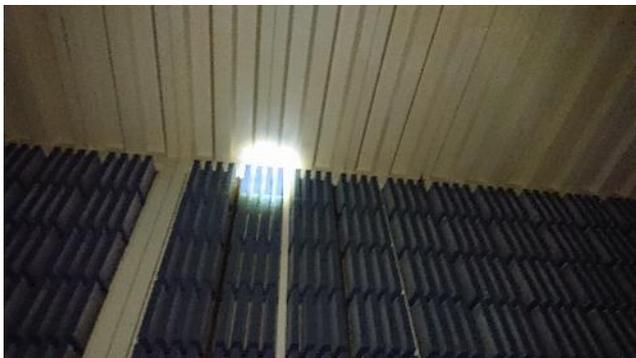


Figure 60: Clean room



Figure 64: Clean room

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Figure 65: Clean room



Figure 69: Compressor inlet



Figure 66: Clean room



Figure 70: Compressor inlet



Figure 67: Compressor inlet



Figure 71: Compressor inlet



Figure 68: Compressor inlet



Figure 72: Compressor inlet



Figure 73: Compressor inlet



Figure 77: Compressor inlet



Figure 74: Compressor inlet



Figure 78: VIGVs & compressor 1<sup>st</sup> stage blades



Figure 75: Compressor inlet



Figure 79: VIGVs & compressor 1<sup>st</sup> stage blades



Figure 76: Compressor inlet



Figure 80: VIGVs & compressor 1<sup>st</sup> stage blades

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**Figure 81: VIGVs**



**Figure 85: VIGVs**



**Figure 82: VIGVs**



**Figure 86: VIGVs**



**Figure 83: VIGVs & compressor 1<sup>st</sup> stage blades**



**Figure 87: Compressor 1<sup>st</sup> stage blade**



**Figure 84: Compressor inlet**



**Figure 88: IC bottom key**

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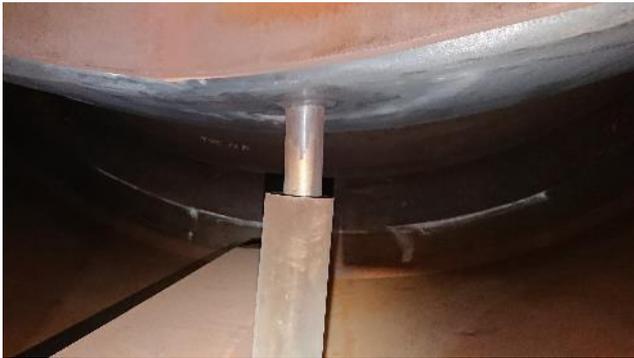


Figure 89: IC drain



Figure 93: CC1 IC CS support palm



Figure 90: CC2 IC CS support palm



Figure 94: CC1 MC CS guide



Figure 91: CC2 MC CS guide



Figure 95: CC1 MC bottom guide



Figure 92: CC2 MC bottom guide

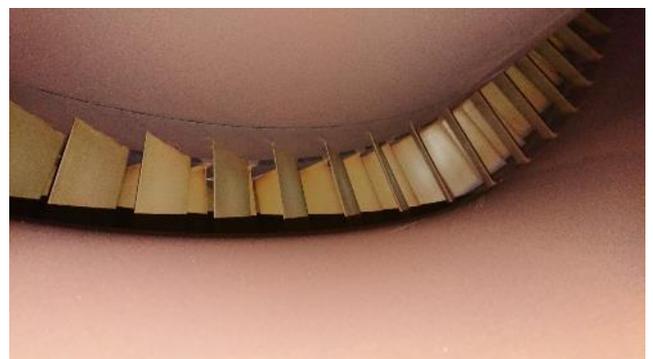


Figure 96: Compressor exhaust

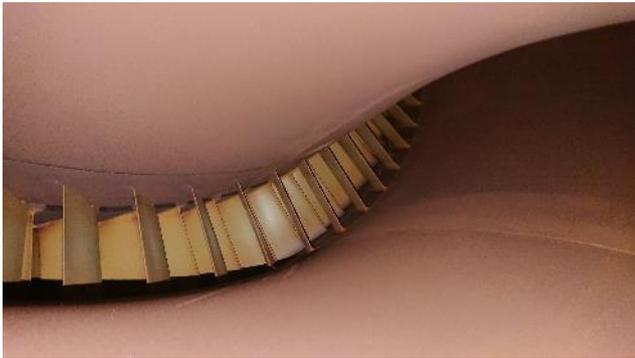


Figure 97: Compressor exhaust



Figure 101: CC1 ceramic tiles

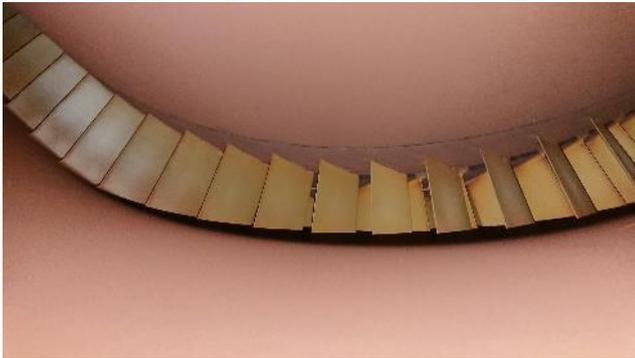


Figure 98: Compressor exhaust



Figure 102: Burner 1-1



Figure 99: CC1 ceramic tiles



Figure 103: Burner 1-1



Figure 100: CC1 ceramic tiles



Figure 104: Burner 1-1

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Figure 105: Burner 1-1



Figure 109: Burner 1-2



Figure 106: Burner 1-1



Figure 110: Burner 1-2



Figure 107: Burner 1-2



Figure 111: Burner 1-2



Figure 108: Burner 1-2



Figure 112: Burner 1-3

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Figure 113: Burner 1-3



Figure 117: Burner 1-3



Figure 114: Burner 1-3



Figure 118: Burner 1-3



Figure 115: Burner 1-3



Figure 119: Burner 1-3



Figure 116: Burner 1-3



Figure 120: Burner 1-4

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Figure 121: Burner 1-4



Figure 125: Burner 1-4

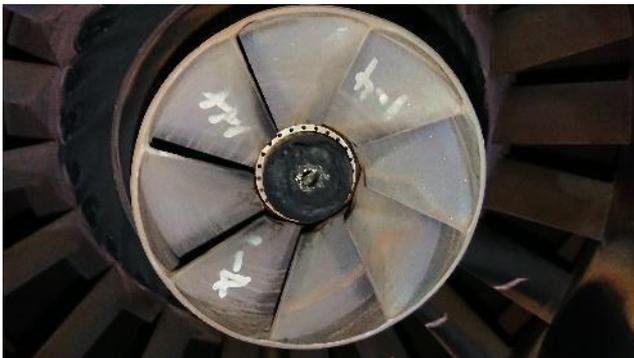


Figure 122: Burner 1-4



Figure 126: Burner 1-5



Figure 123: Burner 1-4



Figure 127: Burner 1-5



Figure 124: Burner 1-4



Figure 128: Burner 1-5

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Figure 129: Burner 1-5



Figure 133: Burner 1-6



Figure 130: Burner 1-5



Figure 134: Burner 1-6



Figure 131: Burner 1-5



Figure 135: Burner 1-6



Figure 132: Burner 1-6



Figure 136: Burner 1-6

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Figure 137: Burner 1-6



Figure 141: Burner 1-7



Figure 138: Burner 1-7



Figure 142: Burner 1-7



Figure 139: Burner 1-7



Figure 143: Burner 1-7



Figure 140: Burner 1-7

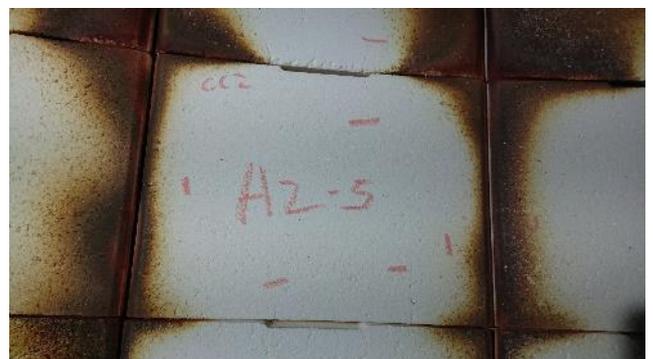


Figure 144: CC2 tiles

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Figure 145: CC2 ceramic tiles



Figure 149: Burner 2-1



Figure 146: CC2 ceramic tiles



Figure 150: Burner 2-1



Figure 147: CC2 ceramic tiles



Figure 151: Burner 2-1



Figure 148: Burner 2-1



Figure 152: Burner 2-1

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Figure 153: Burner 2-2



Figure 157: Burner 2-2



Figure 154: Burner 2-2



Figure 158: Burner 2-2



Figure 155: Burner 2-2



Figure 159: Burner 2-3



Figure 156: Burner 2-2



Figure 160: Burner 2-3

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Figure 161: Burner 2-3



Figure 165: Burner 2-3



Figure 162: Burner 2-3



Figure 166: Burner 2-4



Figure 163: Burner 2-3



Figure 167: Burner 2-4



Figure 164: Burner 2-3



Figure 168: Burner 2-4

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Figure 169: Burner 2-4



Figure 173: Burner 2-5



Figure 170: Burner 2-4



Figure 174: Burner 2-5



Figure 171: Burner 2-4



Figure 175: Burner 2-5



Figure 172: Burner 2-5

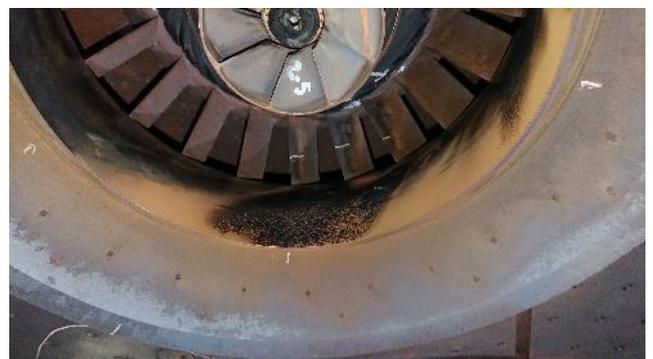


Figure 176: Burner 2-5

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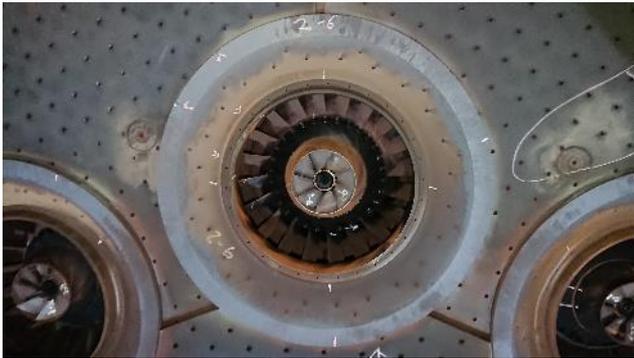


Figure 177: Burner 2-6



Figure 181: Burner 2-6



Figure 178: Burner 2-6



Figure 182: Burner 2-6



Figure 179: Burner 2-6



Figure 183: Burner 2-6



Figure 180: Burner 2-6



Figure 184: Burner 2-6

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Figure 185: Burner 2-6



Figure 189: Burner 2-7



Figure 186: Burner 2-7



Figure 190: Burner 2-7



Figure 187: Burner 2-7



Figure 191: Burner 2-7



Figure 188: Burner 2-7



Figure 192: Burner 2-8

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Figure 193: Burner 2-8



Figure 197: Burner 2-8



Figure 194: Burner 2-8



Figure 198: CC1 FT to MC



Figure 195: Burner 2-8



Figure 199: CC1 FT to MC



Figure 196: Burner 2-8

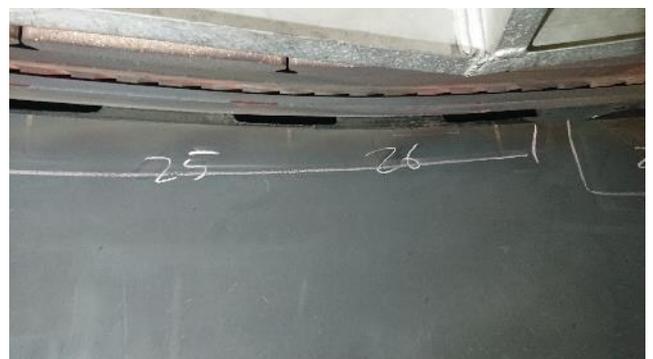


Figure 200: CC1 FT to MC

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Figure 201: CC1 MC

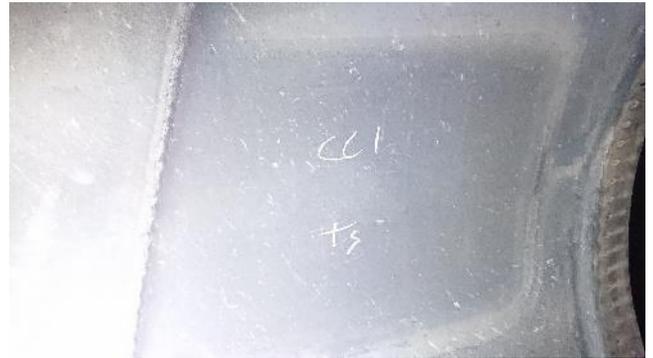


Figure 205: CC1 MC



Figure 202: CC1 MC



Figure 206: CC1 MC to IC



Figure 203: CC1 MC



Figure 207: CC1 MC to IC

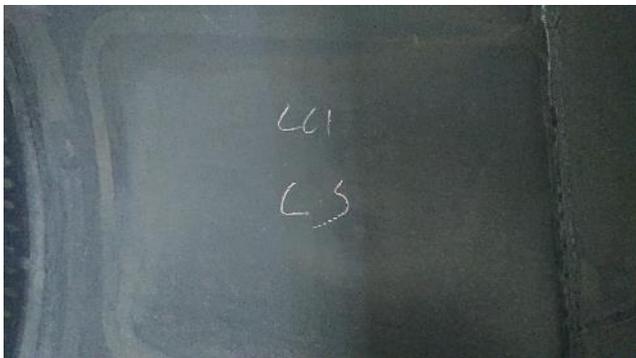


Figure 204: CC1 MC



Figure 208: CC1 MC to IC

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Figure 209: CC1 MC to IC



Figure 213: CC2 MC



Figure 210: CC2 FT to MC



Figure 214: CC2 MC



Figure 211: CC2 FT to MC

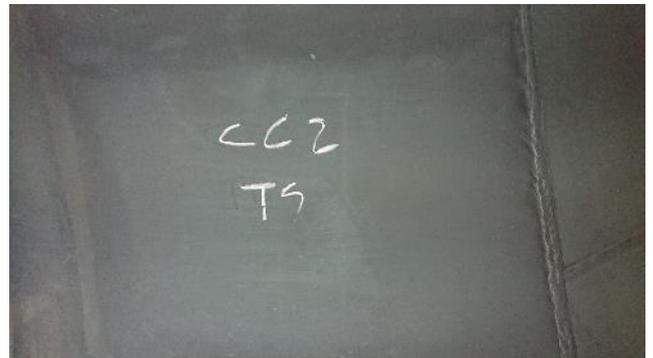


Figure 215: CC2 MC



Figure 212: CC2 MC

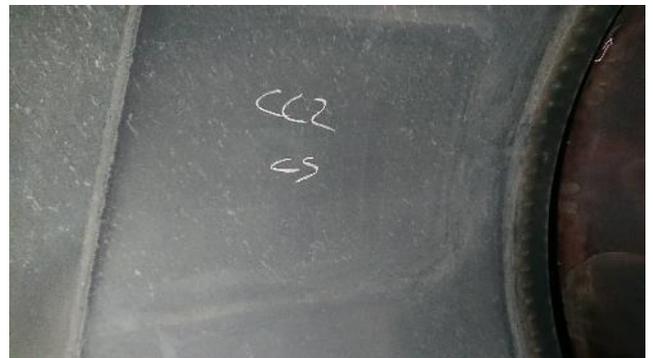


Figure 216: CC2 MC

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Figure 217: CC2 MC to IC



Figure 221: Turbine 1<sup>st</sup> stage vanes



Figure 218: CC2 MC to IC



Figure 222: Turbine 1<sup>st</sup> stage vanes & blades



Figure 219: CC2 MC to IC



Figure 223: Turbine 1<sup>st</sup> stage vanes & blades



Figure 220: IC hub



Figure 224: Turbine 1<sup>st</sup> stage vanes & blades

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Figure 225: Turbine 1<sup>st</sup> stage vanes & blades

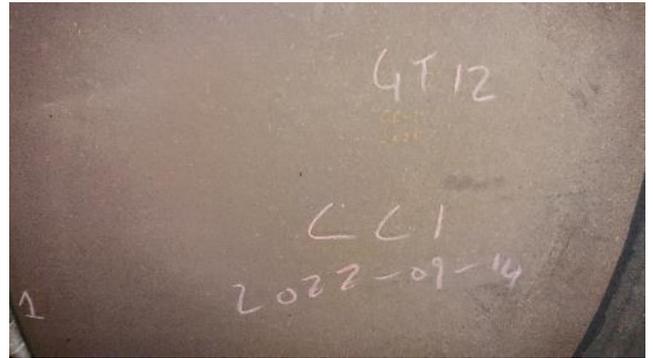


Figure 229: IC hub



Figure 226: Turbine 1<sup>st</sup> stage vanes

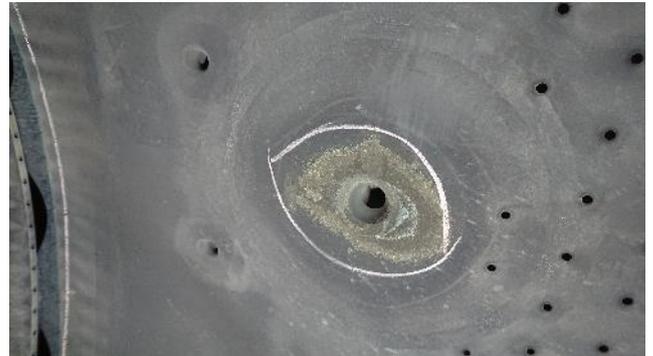


Figure 230: IC



Figure 227: Turbine 1<sup>st</sup> stage blades



Figure 231: IC



Figure 228: Turbine 1<sup>st</sup> stage blades



Figure 232: IC

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Figure 233: IC



Figure 237: Turbine 1st stage vanes



Figure 234: Turbine 1st stage vanes



Figure 238: Turbine 1st stage vanes



Figure 235: Turbine 1st stage vanes & blades



Figure 239: Turbine 1st stage vane #6



Figure 236: Turbine 1st stage vanes



Figure 240: Turbine 1st stage vane #6

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Figure 241: Turbine 4<sup>th</sup> stage blades



Figure 245: Turbine 4<sup>th</sup> stage blades



Figure 242: Turbine 4<sup>th</sup> stage blades



Figure 246: Turbine 4<sup>th</sup> stage blades



Figure 243: Turbine 4<sup>th</sup> stage blades & vanes



Figure 247: Turbine 4<sup>th</sup> stage blades



Figure 244: Turbine 4<sup>th</sup> stage blades & vanes



Figure 248: Turbine 4<sup>th</sup> stage blades

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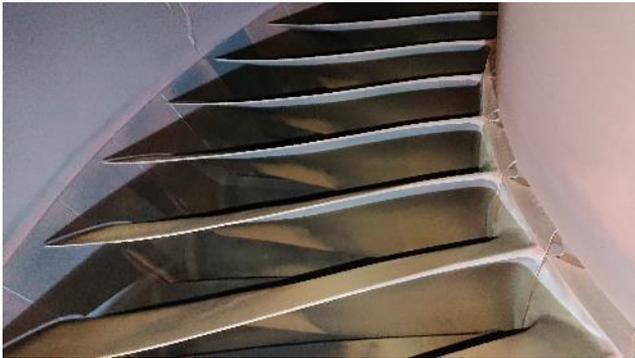


Figure 249: Turbine 4<sup>th</sup> stage blades



Figure 253: Forgein object in exhaust



Figure 250: Turbine 4<sup>th</sup> stage blades



Figure 254: Exhaust – example of crack



Figure 251: Turbine 4<sup>th</sup> stage blades



Figure 255: Exhaust – example of crack



Figure 252: Exhaust cushion

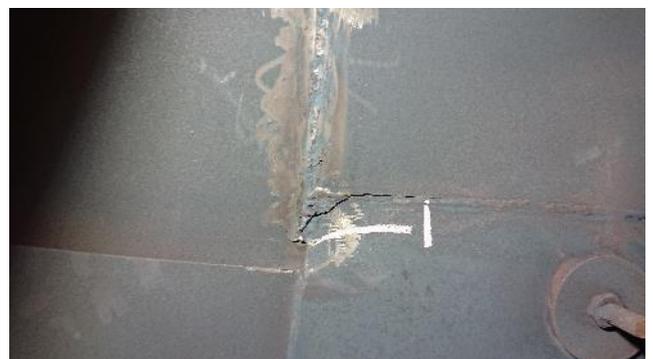


Figure 256: Exhaust – example of crack

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**Figure 257: Loose drain pipe**



**Figure 261: Exhaust – example of crack**



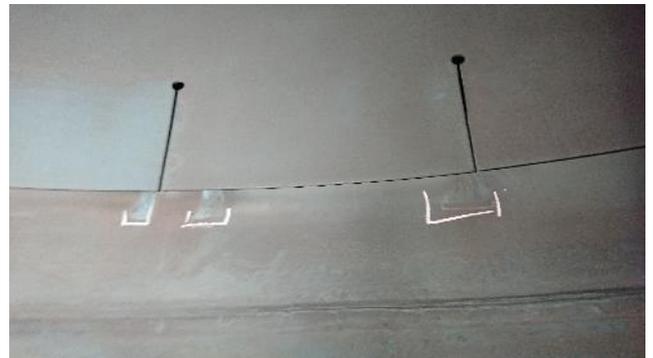
**Figure 258: Loose drain pipe**



**Figure 262: Exhaust – example of rubbing**



**Figure 259: Exhaust – example of crack**



**Figure 263: Exhaust – example of rubbing**



**Figure 260: Exhaust – visible insulation**



**Figure 264: Exhaust – example of crack & rubbing**

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Figure 265: Exhaust – example of rubbing



Figure 269: Exhaust – example of crack



Figure 266: Exhaust – example of crack



Figure 270: Exhaust – example of crack



Figure 267: Exhaust – example of crack



Figure 271: Exhaust – example of crack



Figure 268: Exhaust – example of rubbing



Figure 272: Exhaust – example of crack

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Figure 273: Exhaust – example of crack



Figure 277: Exhaust – example of crack



Figure 274: Exhaust – example of crack

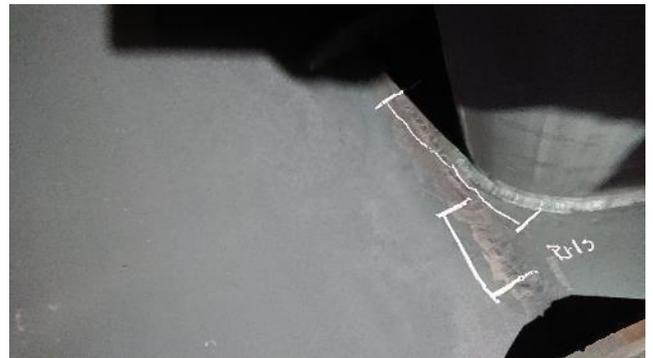


Figure 278: Exhaust – example of crack



Figure 275: Exhaust – example of hammering



Figure 279: Exhaust – example of crack



Figure 276: Exhaust – example of hammering



Figure 280: Exhaust – example of crack



Figure 281: Exhaust – example of crack



Figure 285: Exhaust – example of hammering



Figure 282: Exhaust – example of crack



Figure 286: Exhaust – example of hammering

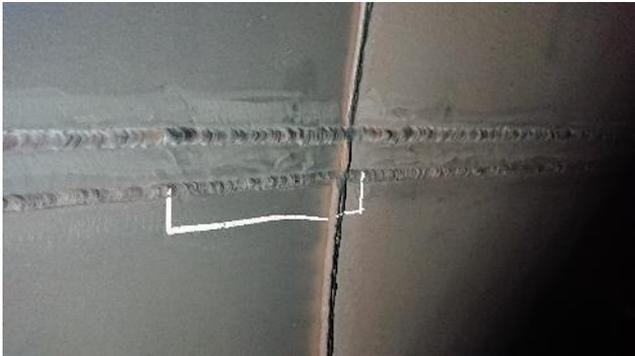


Figure 283: Exhaust – example of crack



Figure 287: Exhaust – example of crack



Figure 284: Exhaust – example of crack



Figure 288: Exhaust – example of crack

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**Figure 289: Exhaust – example of crack**



**Figure 290: Exhaust – example of crack**



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**Inspection Report**  
**Gourikwa – GT12 Minor**  
**Inspection**

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<b>Date</b>	23/01/2023		
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**APPENDIX B**

	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Leak Check Visual Inspection	Checksheet Reference #:	9002
<b>Decommissioning</b>	<b>Siemens SGT5-2000E</b>	Page #:	3 of 5
	<b>Gas Turbine</b>	Project #:	GOU.M13
		Relevant Procedures:	240-136723367

**Notes:**

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

Lube oil and Jacking oil skid including pipework to all bearings
<p><u>Moderate oil on skid</u></p> <p><u>Some oil near coolers</u></p> <p><u>Minor oil near mist separator</u></p> <p><u>Significant oil near lube oil pumps</u></p> <p><u>Line to generator not adequately supported (on gen hall side)</u></p>

Control oil skid including pipework to Control valves
<p><u>Moderate oil on skid</u></p> <p><u>Skid dirty</u></p>

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				<b>NCR OR WORK ORDER NUMBER:</b>
ERI ENGINEER	Johan Otto		2022/09/13	

ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER	
NAME:		NAME:		NAME:	P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:	
DATE:	Log #:	DATE:		DATE:	2022/09/13

**Check Sheet 1:Leak check - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Leak Check Visual Inspection	Checksheet Reference #:	9002
Decommissioning	<b>Siemens SGT5-2000E</b>	Page #:	2 of 5
	Gas Turbine	Project #:	GOU.MI3
		Relevant Procedures:	240-136723367

**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**

DO supply line not correctly supported (repeat finding)

Plugs not installed (repeat finding)

Some oil on skid

12MBN17AA371 broken

**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				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 2: Leak check - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Insulation	<b>Checksheet Reference #:</b>	V94-2-6004
<b>Inspection</b>	Siemens SGT5-2000E	<b>Page #:</b>	1 of 4
	Centreline	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

**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**

rubber on domes out of position

---

White deposits on sides

---



---

Resonance from octopus pipes - design intervention required

**Centre Casing**

Rust & white deposits

---



---



---



---

**Exhaust Casing**

Corrosion & white deposits

---



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RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 3: Insulation - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Combustion Chamber Outer Pipework Visual Inspections - RHS	<b>Checksheet Reference #:</b>	V94-2-2016
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	2 of 2
	<b>Combustion</b>	<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

Area	Inspection	Findings	Remarks
Fuel Oil Return Line	Signs of overheating / Discoloration	No	<div style="border: 1px solid black; padding: 2px;"> <p align="center">Old signs of fire @2-5 &amp; 2-6 noted</p> </div>
	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	

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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Johan Otto		2022/09/14	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 4: CC2 - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Leak Check Visual Inspection	Checksheet Reference #:	9002
Decommissioning	<b>Siemens SGT5-2000E</b>	Page #:	1 of 5
	Gas Turbine	Project #:	GOU.MI3
		Relevant Procedures:	240-136723367

**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**

Damaged labels 12MBM12CT101, 12MBM12CT102 & 12MBM12CT109

Seepage noted from premix bellow @1-3

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**RHS Combustion chamber**

Seepage noted from premix bellow @ 2-8

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NAME:		NAME:		NAME: P.L. Calana
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**Check Sheet 5: Leak check - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Filter House Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-1901
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 6
	<b>Compressor</b>	<b>Project #:</b>	GOU.M13
		<b>Relevant Procedures:</b>	240-136723367

Area	Inspection Type	Findings	Remarks
Dirty Side	Deposits	No	
	Damage	Yes	Drain clamps corroded
	Filter Completeness	Yes	Coalescing filters moved
	Detached parts / Loose Filters	No	
	Soiling of Filters	Yes	Pre-filters very dirty
	Non-Uniform alignment of Filters	No	
	Unexpected Modifications	No	
	Missing Filters	No	
Clean Side	Forgein Objects	Yes	
	Deposits	Yes	Very dirty with black deposits noted
	Damage	Yes	popped filter noted - site to replace
	Detached parts / Loose Filters	No	
	Formation of Gaps (Light Test)	Yes	1 off filter removed and reinstalled to correct Pinhole noted in structure above door - site will need to schedule intervention
	Flaking of paint / Corrosion	Yes	Corrosion blooming noted on floor - significant intervention required Corrosion spots near roof also noted
	Locking	Yes	
Structure	Forgein Objects	Yes	Water & black particles
	Damage to Door Seals	Yes	Seal strips loose on 2off doors
	Damage to Door Locks	Yes	Clean room lock doesn't exist - site to rectify
	Damage to seals in the Wall region	Yes	corrosion
Silencer	Holes in the Wall	No	
	Detached Parts / Loose Elements	No	
	Deposits, Corrosion	No	Corrosion on floor
	Cracks	No	
Damage	No		

Overview Photos to be taken			
Filter Cassettes		Clean Air Compartment	
Filter Compartment Floor		Compressor Inlet	

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NAME:		NAME:		NAME: P.L. Calana
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**Check Sheet 6: Filter house - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Compressor Inlet Systems Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-1901
<b>Inspection</b>	<b>Siemens SGT5-2000E</b> <b>Compressor</b>	<b>Page #:</b>	2 of 6
		<b>Project #:</b>	GOU.M13
		<b>Relevant Procedures:</b>	240-136723367

Area	Inspection Type	Findings	Remarks
Air Intake Flap	Proper Operation	No	
	Loose Parts	No	
	Forgein Objects	No	
	Corrosion	No	
	Damage	Yes	Scuff marks on wall
Air Intake	Loose Parts	No	
	Forgein Objects	No	
	Deposits	Yes	
	Oil	Yes	
	Proper installation of intake Gaskets	No	
Gasket between Cone and Inlet Structure	Damage	Yes	missing parts of gasket - historically marked
	Oil Saturation	Yes	
Intake Cone Half-Joint Flat Gasket	Damage	No	
Air Intake Structure	Damage to Door Seals	No	
	Damage to Door Locks	Yes	Bottom locking handle has too much play - site to bend into position
	Damage to seals in the Wall region	No	
	Hones in the Wall	No	
	Oil through the Wall	Yes	
	Flaking of Paint / Corrosion	Yes	
Intake Cone	Deposits / Oil Traces	Yes	
	Forgein Objects	No	
	Incomplete Painting	Yes	
	Corrosion	Yes	
Support Struts	Cracks	No	

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**Check Sheet 7: Compressor inlet systems - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Compressor Inlet Systems Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-1901
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	3 of 6
	<b>Compressor</b>	<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

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	No	
Dehumidification System and Unit	Damage	No	
	Forgein 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	

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**Check Sheet 8: Compressor inlet systems - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Compressor Stage 1 Radial Blades Tip Clearances (VLA1)	Checksheet Reference #:	V94-2-6102
<b>Disassembly</b>	<b>Siemens SGT5-2000E</b> <b>Centreline</b>	Page #:	1 of 2
		Project #:	GOU.MB
		Relevant Procedures:	240-136723367

Rotor blade

Stator casing

A<sub>1</sub>

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

ΔS
0.0

1.9
-----

1.9
-----

2.0
-----

2.1
-----

ΔS
0.1

Theoretical Centre	
Top	Right
0.10	-0.08

Specifications	Min	Max
Blade clearance	1.9	2.3
ΔS		0.1

**Check Sheet 9: Compressor 1<sup>st</sup> stage radial blade tip clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Diffuser Inspection	<b>Checksheet Reference #:</b>	V94-2-1604
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 1
	<b>Compressor</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

Visual Inspection		
Area to Inspect	Findings	Remarks
Vanes - Lock Washers Damage	No	
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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**Check Sheet 10: Compressor diffusor - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	LHS CC Burner Alignment	Checksheet Reference #:	V94-2-2010-1
Disassembly	Siemens SGT5-2000E Combustion	Page #:	1 of 2
		Project #:	GOU.MB
		Relevant Procedures:	240-136723367

Viewed from below

Viewed from Above

Location	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8
A	4.9	5.5	5.4	6.4	6.2	5.4	6.0	5.5
B	5.7	5.4	5.8	5.8	6.7	5.7	5.4	5.2
C	5.8	5.9	5.7	5.8	6.3	5.9	5.7	5.7
D	5.0	5.5	4.8	5.3	5.9	5.0	5.6	4.9
A-C	0.9	0.4	0.4	0.6	0.2	0.5	0.3	0.3
B-D	0.7	0.1	1.0	0.5	0.8	0.7	0.3	0.3

Spec	Max
Mis-alignment	1.5

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NAME:		NAME:		NAME: P.L. Calana
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**Check Sheet 13: CC1 burner alignment**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Hot Side Dome Plate LHS CC	<b>Checksheet Reference #:</b>	V94-2-2009-1
Disassembly	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 2
	Combustion	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

Bottom plate Left  
 View in opposite flow direction

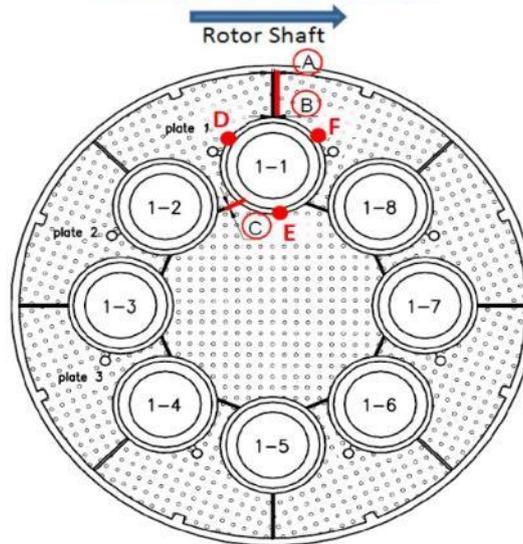


Plate	A	B	C	D	E	F
1	10.4	10.8	18.7	19.6	12.2	14.4
2	9.7	11.2	18.1	17.8	12.0	19.7
3	12.7	11.3	13.5	19.2	12.9	17.7
4	11.1	12.4	8.9	20.1	13.1	17.9
5	12.4	11.3	6.6	16.8	13.2	19.5
6	10.1	10.0	7.2	14.5	14.3	17.0
7	10.7	10.6	10.1	16.0	14.3	14.6
8	10.7	10.5	15.1	12.7	13.1	13.6

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

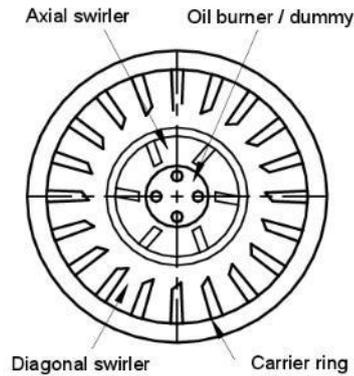
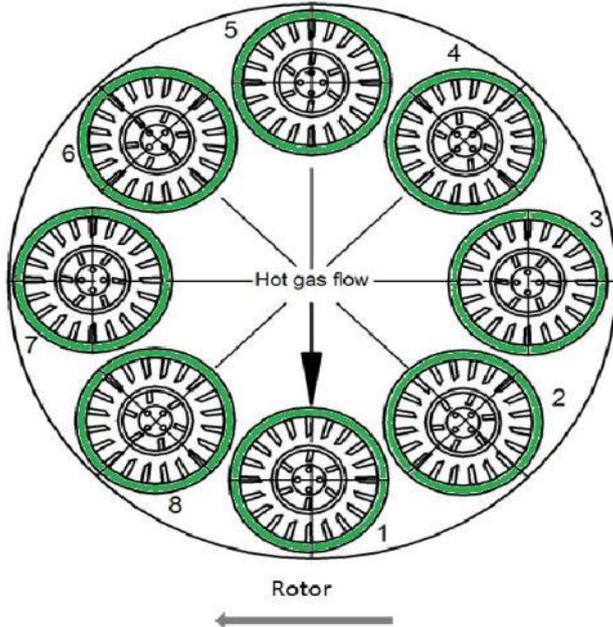
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NAME:		NAME:		NAME: P.L. Calana
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**Check Sheet 14: CC1 dome plate clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	LHS CC Burner Assembly Visual Inspection	Checksheet Reference #:	V94-2-2012-1
Inspection	<b>Siemens SGT5-2000E</b>	Page #:	1 of 1
	<b>Combustion</b>	Project #:	GOU.MI3
		Relevant Procedures:	240-136723367



Remarks: BIR cracks on all

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Key	
Corrosion	

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ERI ENGINEER	Johan Otto		2022/09/13	
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**Check Sheet 15: CC1 burner assembly - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Diffusion Burners LHS Visual Inspections	<b>Checksheet Reference #:</b>	V94-2-2023-1
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 1
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

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							
	Erosion <b>*Boroscopic Inspection*</b>								
	Seat								
	Scaling								
	Deposits								
	Discoloration								
Burner Needle	Signs of overheating								
	Cracks <b>*Boroscopic Inspection*</b>								
	Correct Installation <b>*Boroscopic Inspection*</b>								
Axial Swirlers	Deposits	No	Yes	No	No	No	No	No	No
	Clogging of bores	No							
	Deformation of Vanes	No							
	Scaling	No							
	Erosion	No							
	Cracks	No	No	No	No	No	Yes	No	No
Burner Support	Discoloration								
	Signs of Overheating								
	Cracks								
	Damage								
Igniter	Spark Test								
	Damage								
Thermo-couples	Damage								

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 16: CC1 diffusion burners - VI**

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 Gourikwa – GT12 Minor  
 Inspection

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Premix Burner LHS Visual Inspections	<b>Checksheet Reference #:</b>	V94-2-2028
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 3
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

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	No	No	Yes	No	No	No	No	No
	Hub - Deposits / Coking	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Hub - Fit of Nozzles								
Diagonal Swirler Entire Surface	Deposits / Coking / Plugging								
	Corrosion	No	No	Yes	Yes	Yes	Yes	Yes	Yes
	Deformation	No							
	Material Break-out	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							
Expansion Joint	Cracks	No							
	Damage								
Hold-downs for Diagonal Swirler	Wear								
	Cracks								
	Tight fit								
Gas Distributor (Spider)	Corrosion								
	Cracks								
	Deposits "Boroscopic Inspection"								

**Remarks:** DS OH; 1-1:7, 1-2:4, 1-3:6, 1-4:3, 1-5:6, 1-6:6, 1-7:8, 1-8:2  
 Blocked nozzles; 1-3:2 (historic)

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 17: CC1 premix burners - VI**

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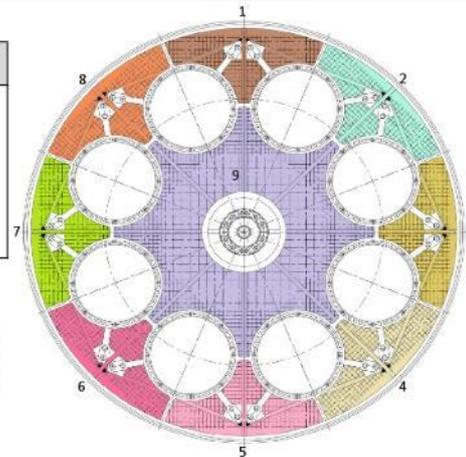
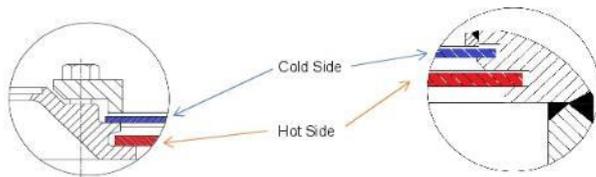
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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Dome Plates Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-2020
<b>Inspection</b>	<b>Siemens SGT5-2000E Combustion</b>	<b>Page #:</b>	1 of 2
		<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

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								
		Scaling	No	No	No	Yes	No	No	No	No	
		Cracks	No								
	Deformation	Yes	No	Yes	Yes	No	No	No	No		
RHS CC	Cold Side	Hammering Marks									
		Scaling									
		Cracks									
	Hot Side	Hammering Marks	Yes								
		Scaling	Yes	No	Yes	Yes	Yes	No	No	Yes	No
		Cracks	No	No							
	Deformation	Yes	Yes	No	No	No	No	Yes	No	No	

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



<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 18: Dome plates - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Flame Tube Inspection - RHS	<b>Checksheet Reference #:</b>	V94-2-2026-2
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 1
	<b>Combustion</b>	<b>Project #:</b>	GOU.M13
		<b>Relevant Procedures:</b>	240-136723367

Visual Inspections			
Area	Inspection	Findings	Remarks
Sight Glass	Soiling	No	<hr/>
	Damage	No	
Tile Support Ring (F-ring)	Scaling / Mechanical Material Thinning	No	
	Scuffing Marks / Hammering Marks	Yes	
	Cracks	Yes	
Centering Guide	Scoring Marks		
Pressure Sensing Lines	Cracks		
	Unobstructed Cross Section		
Flame Culinder with Heat Shield Removed	Discoloration		
	Scaling / Mechanical Material Thinning		
	Wear		
	Cracks		

NDE Inspections		
Inspection	Findings	Remarks
Outer Brick Holder Welds PT - 432 off		<hr/>

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				<b>NCR OR WORK ORDER NUMBER:</b>
ERI ENGINEER	Johan Otto		2022/09/13	
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 19: CC2 FT - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	RHS CC Burner Alignment	<b>Checksheet Reference #:</b>	V94-2-2010-2
Disassembly	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 2
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

Viewed from below

Flow

Viewed from Above

Location	2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8
A	6.0	7.0	6.3	5.9	4.7	6.0	6.8	5.9
B	4.8	6.0	5.2	4.4	4.2	5.3	5.5	4.7
C	5.5	5.9	6.0	5.5	5.3	4.9	5.7	5.0
D	5.8	6.2	4.6	6.0	3.6	5.9	7.0	5.4
A-C	0.6	1.1	0.3	0.4	0.6	1.1	1.0	0.9
B-D	1.0	0.1	0.5	1.7	0.6	0.6	1.5	0.7

Spec	Max
Mis-alignment	1.5

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ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 21: CC2 burner alignment**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Hot Side Dome Plate RHS CC	Checksheet Reference #:	V94-2-2009-2
Disassembly	<b>Siemens SGT5-2000E</b>	Page #:	1 of 2
	Combustion	Project #:	GOU.MB
		Relevant Procedures:	240-136723367

Bottom plate Right  
 View in opposite flow direction

Rotor Shaft

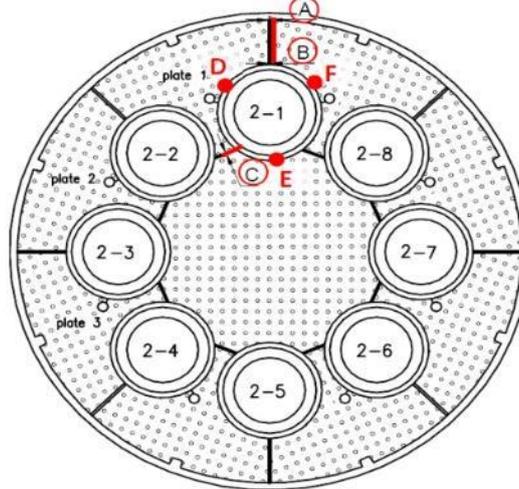


Plate	A	B	C	D	E	F
1	8.9	9.7	12.5	18.9	12.6	15.4
2	12.3	12.5	13.3	18.9	12.3	19.5
3	14.0	12.6	10.2	16.0	12.0	19.3
4	10.4	10.3	9.3	15.6	12.6	13.4
5	9.5	9.6	9.9	15.1	14.3	12.7
6	9.2	11.3	11.8	18.2	11.0	16.7
7	10.0	11.8	13.9	16.0	13.0	20.4
8	11.0	10.0	13.4	16.6	13.0	15.4

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

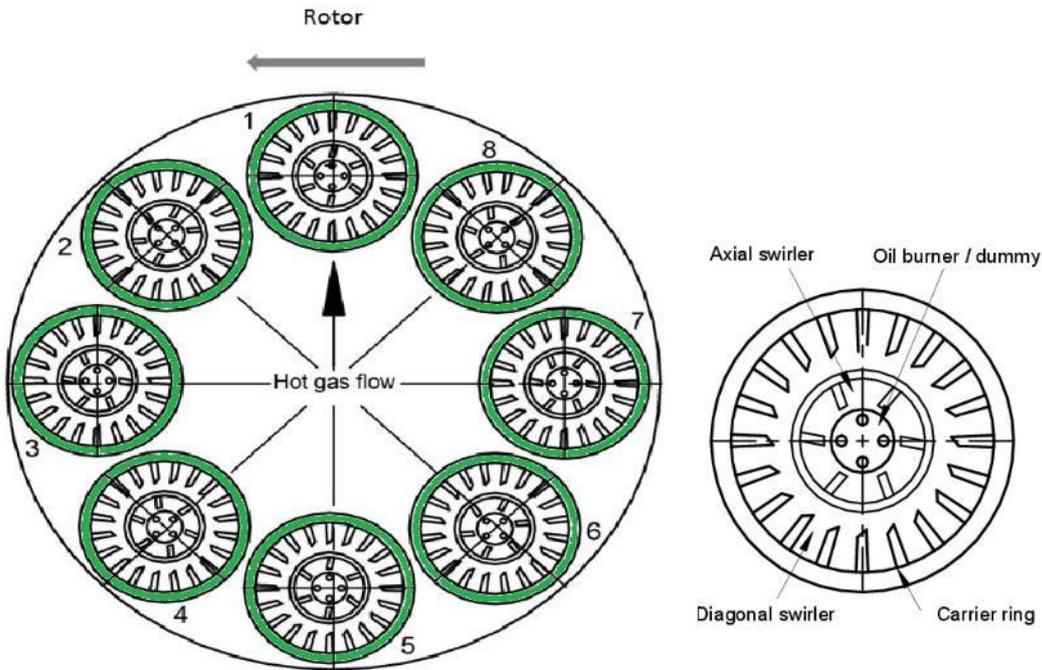
RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Johan Otto		2022/09/13	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 22: CC2 dome plate clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	RHS CC Burner Assembly Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-2012-2
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 1
	<b>Combustion</b>	<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367



Remarks: \_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Key	
Corrosion	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 23: CC2 burner assembly - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Diffusion Burners RHS Visual Inspections	<b>Checksheet Reference #:</b>	V94-2-2023-2
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 1
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

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							
	Erosion <b>*Boroscopic Inspection*</b>								
	Seat								
	Scaling								
	Deposits								
	Discoloration								
Burner Needle	Signs of overheating								
	Cracks <b>*Boroscopic Inspection*</b>								
	Correct Installation <b>*Boroscopic Inspection*</b>								
Axial Swirlers	Deposits	No	No	No	Yes	No	No	No	No
	Clogging of bores	No							
	Deformation of Vanes	No							
	Scaling	No							
	Erosion	No	Yes	Yes	No	No	No	No	No
	Cracks	No							
Burner Support	Discoloration								
	Signs of Overheating								
	Cracks								
	Damage								
Igniter	Spark Test								
	Damage								
Thermo-couples	Damage								

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 24: CC2 diffusion burners - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Premix Burner RHS Visual Inspections	<b>Checksheet Reference #:</b>	V94-2-2028
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	2 of 3
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

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	No
	Hub - Deposits / Coking	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Hub - Fit of Nozzles								
Diagonal Swirler Entire Surface	Deposits / Coking / Plugging								
	Corrosion	No	No	Yes	No	Yes	No	No	No
	Deformation	No							
	Material Break-out	No	No	No	No	No	Yes	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	Yes	Yes	Yes	No	Yes	No	Yes
Cracks	No	Yes	Yes	Yes	No	Yes	No	Yes	
Expansion Joint	Damage								
Hold-downs for Diagonal Swirler	Wear								
	Cracks								
	Tight fit								
Gas Distributor (Spider)	Corrosion								
	Cracks								
	Deposits "Boroscopic Inspection"								

**Remarks:** DS OH; 2-1:4, 2-2:5, 2-3:6, 2-4:7, 2-5:6, 2-6:2, 2-7:9, 2-8:3  
 Blocked nozzles; 2-5:2 (historic), 2-6:All, 2-7:2

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 25: CC2 premix burners - VI**

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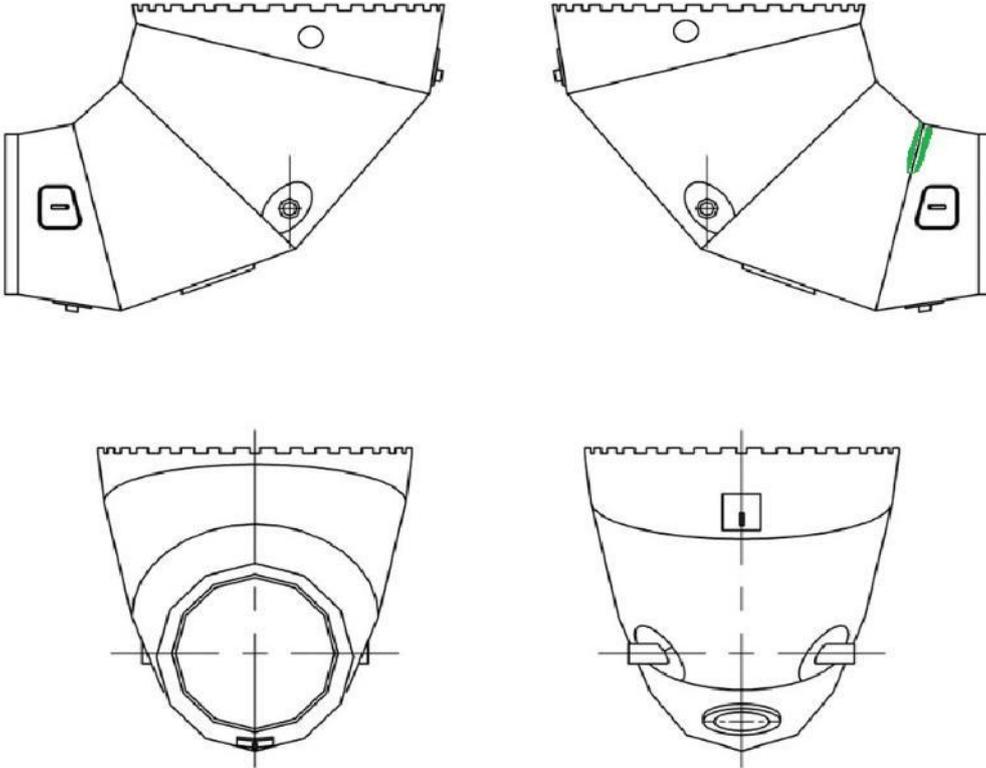
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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	LHS Mixing Chamber Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-2011-1
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 3
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367



Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Key	
Corrosion	
Cracks	

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				<b>NCR OR WORK ORDER NUMBER:</b>
ERI ENGINEER	Johan Otto		2022/10/14	
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 26: CC1 MC - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	LHS Mixing Chamber Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-2011-1
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	2 of 3
	<b>Combustion</b>	<b>Project #:</b>	GOU.M13
		<b>Relevant Procedures:</b>	240-136723367

Area	Inspection	Findings	Remarks
Complete Surface	Corrosion	Yes	
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	No	
	Deformation	No	
Reinforcement and Guide Plate Regions	Corrosion	No	
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	No	
Castellations	Scoring Marks / Wear	Yes	7-8, 11, 12-21, 22-26, 27-28, 31, 32-33, 35, 36-1
	Deformation	No	
Guides	LHS - Wear		
	Bottom - Wear		
	RHS - Wear		
Bushing Supports	LHS - Wear		
	RHS - Wear		
Cooling Air Ring	Wear / Hammering Marks	Yes	1-5, 6-11, 12, 13-17, 18, 19, 20
Manhole Insert	Mechanical Material thinning	No	
	Scaling	No	
Manhole Collar	Scaling	No	
	Cracks	No	

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/14	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 27: CC1 MC - VI**

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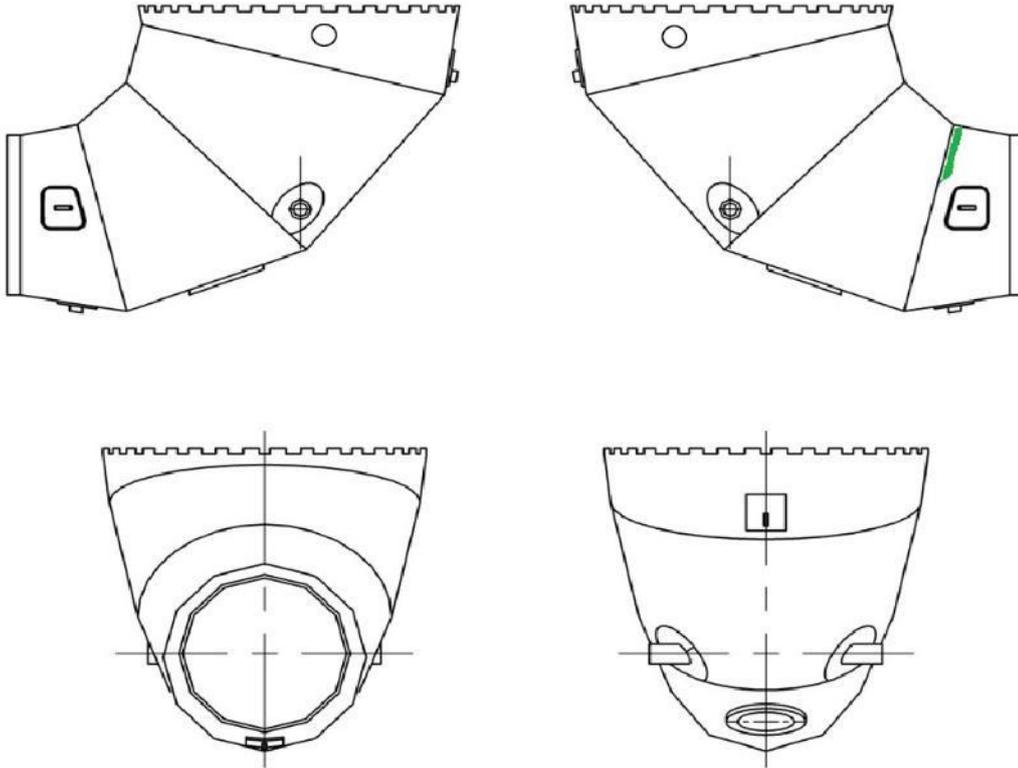
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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	RHS Mixing Chamber Inspection	<b>Checksheet Reference #:</b>	V94-2-2011-2
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 3
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367



Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Key	
Corrosion	
Cracks	

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VERIFIED BY - TECHNICIAN				<b>NCR OR WORK ORDER NUMBER:</b>
ERI ENGINEER	Johan Otto		2022/09/14	
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P. L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 28: CC2 MC - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	RHS Mixing Chamber Inspection	<b>Checksheet Reference #:</b>	V94-2-2011-2
<b>Inspection</b>	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	2 of 3
	<b>Combustion</b>	<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

Area	Inspection	Findings	Remarks
Complete Surface	Corrosion	Yes	
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	No	
	Deformation	No	
Reinforcement and Guide Plate Regions	Corrosion	No	
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	No	
Castellations	Scoring Marks / Wear	Yes	1, 2, 3, 4-8, 12, 15-20, 31-35
	Deformation	No	
Guides	LHS - Wear		
	Bottom - Wear		
	RHS - Wear		
Bushing Supports	LHS - Wear		
	RHS - Wear		
Cooling Air Ring	Wear / Hammering Marks	Yes	6, 7-8, 9-10, 11, 16-4
Manhole Insert	Mechanical Material thinning	No	
	Scaling	No	
Manhole Collar	Scaling	No	
	Cracks	No	

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/14	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 29: CC2 MC - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Mixing Chamber to Inner Casing Clearances	Checksheet Reference #:	V94-2-2005
<b>Disassembly</b>	<b>Siemens SGT5-2000E</b>	Page #:	1 of 2
	<b>Combustion</b>	Project #:	GOU.MB
		Relevant Procedures:	240-136723367

Side-view of castellations  
inner casing  
mixing chamber  
B C

Cross-sectional view  
S  
A  
mixing chamber  
inner casing

Remarks: \_\_\_\_\_

View in flow direction

Specification	Min	Max
Average A	3	3.5
B	16	19

View in flow direction

LHS CC				
Location	A	B	C	S
1	22.2	12		
2	18.3	12		
3	15.3	11		
4	13.3	12		
5	14.6	16		
6	14.7	17		
7	14.3	12		
8	13.7	15		
9	14.2	14		
10	17.3	12		
11	20.6	12		
12	22.6	12		
13	22.0	14		
14	17.8	14		
15	15.3	14		
16	13.5	13		
17	14.0	11		
18	17.9	10		
19	20.7	11		
20	22.3	11		
Average	17.2	12.6		

RHS CC				
Location	A	B	C	S
1	22.4	12		
2	21.9	11		
3	19.7	13		
4	18.2	11		
5	19.0	16		
6	20.9	15		
7	21.1	14		
8	20.4	11		
9	19.2	13		
10	17.3	11		
11	15.9	10		
12	13.6	10		
13	14.3	10		
14	14.3	11		
15	13.5	13		
16	12.1	12		
17	13.4	10		
18	15.4	11		
19	17.9	11		
20	19.3	11		
Average	17.5	11.8		

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VERIFIED BY - TECHNICIAN				
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ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P. L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:		DATE:		DATE: 2022/09/14

**Check Sheet 30: MC to IC clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Flame Tube Clearances	<b>Checksheet Reference #:</b>	V94-2-2008
Disassembly	Siemens SGT5-2000E Combustion	<b>Page #:</b>	1 of 2
		<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

Remarks: \_\_\_\_\_

LHS			
Point	s	t	u
1	5.3	2	
2	5.3	5	
3	3.7	5	
4	3.7	6	
5	3.7	10	
6	2.8	9	
7	1.0	5	
8	0.9	7	
9	2.8	8	
10	4.5	6	
11	4.3	5	
12	1.9	9	
13	0.8	8	
14	0.0	7	
15	0.0	5	
16	0.2	7	
17	2.7	5	
18	3.7	7	
19	3.8	8	
20	3.7	7	
21	1.9	6	
22	2.1	7	
23	2.3	8	
24	0.5	7	
25	0.4	9	
26	1.9	5	
27	3.7	5	
28	3.7	3	
29	5.3	4	
30	6.0	5	
31	6.0	4	
32	6.0	4	
33	6.1	2	
34	6.1	4	
35	6.2	3	
36	6.4	3	
Ave	3.3	5.8	

RHS			
Point	s	t	u
1	3.3	5	
2	2.2	5	
3	1.9	5	
4	1.2	6	
5	1.1	6	
6	1.0	5	
7	0.2	6	
8	0.2	5	
9	0.6	4	
10	1.0	4	
11	1.0	6	
12	0.8	7	
13	0.6	7	
14	0.5	5	
15	1.9	8	
16	2.4	10	
17	2.3	8	
18	4.1	7	
19	4.1	8	
20	4.3	7	
21	4.2	8	
22	4.6	6	
23	6.0	8	
24	6.0	7	
25	6.0	7	
26	6.0	7	
27	8.8	8	
28	8.9	7	
29	9.0	8	
30	8.7	8	
31	5.3	9	
32	3.6	8	
33	3.5	8	
34	3.7	10	
35	4.2	7	
36	4.0	9	
Ave	3.5	6.9	

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

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/14	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:		DATE:		DATE: 2022/09/14

**Check Sheet 31: FT to MC clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Inner Casing Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-2805
<b>Inspection</b>	<b>Siemens SGT5-2000E</b> <b>Combustion</b>	<b>Page #:</b>	1 of 3
		<b>Project #:</b>	GOU.M13
		<b>Relevant Procedures:</b>	240-136723367

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)	No	
	Net of Cracks	No	
	Spalling of TBC	No	
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	No	
	Cracks	No	
Clamping Bolt for Protective Liner and Flow Baffle	Wear		
	Thermal Stress Cracks On Transition Radius of Bolt		
	Cracks in other Locations		

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/14	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 32: IC - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Stage 1 Vanes Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-3005-1
Inspection	<b>Siemens SGT5-2000E</b> Turbine	<b>Page #:</b>	2 of 6
		<b>Project #:</b>	GOU.MB
		<b>Relevant Procedures:</b>	240-136723367

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	

<b>REMARKS:</b>	Spallation on inner shroud of #1
	Spallation of TBC inner shroud near aerofoil of #2
	TBC spallation & cracks in
	MCrAlY of #6
	MCrAlY does not appear deteriorated

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				<b>NCR OR WORK ORDER NUMBER:</b>
ERI ENGINEER	Johan Otto		2022/09/14	
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 33: Turbine 1<sup>st</sup> stage vanes - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Stage 1 Blades Visual Inspection	Checksheet Reference #:	V94-2-3802-1
Inspection	<b>Siemens SGT5-2000E</b> Turbine	Page #:	2 of 7
		Project #:	GOU.MB
		Relevant Procedures:	240-136723367

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

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

**Remarks:** Some chipped TBC on LE of aerofoils

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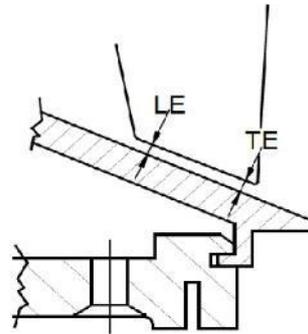
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PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/14	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 34: Turbine 1<sup>st</sup> stage blades - VI**

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 <b>Disassembly</b>	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT12
	Turbine Radial Blade Tip Clearances	Checksheet Reference #:	V94-2-6301
	<b>Siemens SGT5-2000E</b>	Page #:	1 of 2
	Centreline	Project #:	GOU.M13
		Relevant Procedures:	240-136723367



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

Stage	Min	Max	Δs
Stage 1	4.3	4.3	0.1
Stage 4	6.0	6.0	0.1

Theo-Centre		Top		Right
		LE	TE	
Stage 1	LE	-0.05	-0.35	-0.4
	TE	-0.05	-0.4	
Stage 4	LE	0.25	0	-0.13
	TE	0.15	-0.13	

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

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - SUPERVISOR				M & TE NUMBER:
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VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Johan Otto		2022/09/13	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P. L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 35: Turbine 1<sup>st</sup> and 4<sup>th</sup> stage radial blade tip clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Exhaust Casing Inspections	<b>Checksheet Reference #:</b>	V94-2-5002
<b>Inspection</b>	<b>Siemens SGT5-2000E Exhaust</b>	<b>Page #:</b>	1 of 1
		<b>Project #:</b>	GOU.M13
		<b>Relevant Procedures:</b>	240-136723367

Area	Sub-Area	Inspection	Findings	Remarks	
Casing Lining	Inside Wall Surface	Deposits	No		
		Deformation / Dents	No		
		Forgein 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		
	Expansion Joint	Weld Bead - Cracks	Yes		
		Cracks		Boroscopic Inspection	
Exhaust Casing	Horizontal Joint Faces	Scoring Marks			
		Marks indicating that Hot Air has Escaped			
	Partition Plate to TVC	Gaping (Horizontal / Vertical)			Significant horizontal crack on LHS
		Mechanical Material Thinning			
Vertical Flange	Scoring Marks				
Hub Cover Plate	Sheet Metal Jacketing	Scuffing Marks / Wear	Yes		
	Weld Beads	Cracks	Yes		

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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CHECKED BY - SUPERVISOR				<b>M &amp; TE NUMBER:</b>
CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 36: Exhaust casing - VI**

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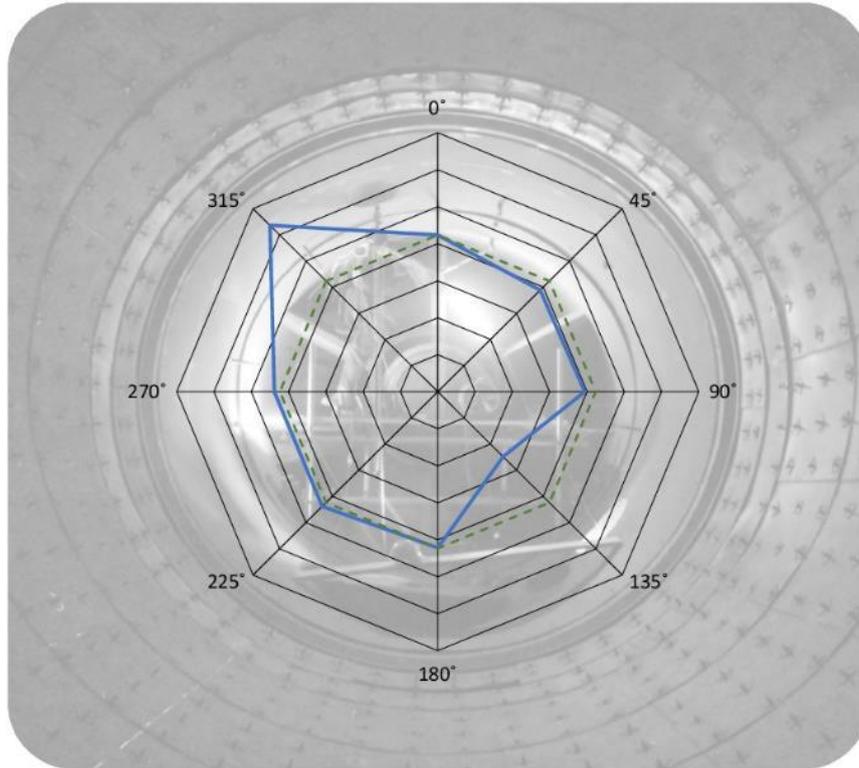
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**Business Management System**  
**Inspection Report**  
**Gourikwa – GT12 Minor**  
**Inspection**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Casing to Cover Plate Measurements	<b>Checksheet Reference #:</b>	V94-2-5003
<b>Inspection</b>	<b>Siemens SGT5-2000E Exhaust</b>	<b>Page #:</b>	1 of 1
		<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367



Gap between Exhaust Casing and Cover Plate for Expansion Joint								
0°	45°	90°	135°	180°	225°	270°	315°	Average
21.2	19.4	19.7	12.4	21.1	21.9	21.9	31.8	21.2

<b>RESPONSIBLE PERSON</b>	<b>NAME (BLOCK LETTERS)</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>SERIAL NUMBERS:</b>
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<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
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**Check Sheet 37: Exhaust casing to cover plate clearances**

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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT12
	Downstream of Exhaust Casing Inspections	<b>Checksheet Reference #:</b>	V94-2-5004
<b>Inspection</b>	<b>Siemens SGT5-2000E Exhaust</b>	<b>Page #:</b>	1 of 1
		<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

Area	Sub-Area	Inspection	Findings	Remarks
Exhaust Diffuser	Surface of Inside Walls	Deformation / Dents	No	
		Forgein Object Impact	No	
		Cracks	Yes	
	Weld Beads	Cracks	Yes	Drain line loose
	Mamhoie Contact Surfaces	Scoring Marks	No	
	Cover Plate for Expansion Joint	Scuffing Marks	No	
Thermocouples		Cracks	Yes	
		Corrosion	No	
		Loosened / Detached	No	
		Cracks (Weld beads at screw-in head)	No	
		Damage	No	

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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/09/13	<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/14

**Check Sheet 38: Downstream of exhaust casing - VI**

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	<b>ESKOM GOURIKWA POWER STATION</b> Stage 4 Blades Visual Inspection	Unit #:	GT12
	<b>Inspection</b> Siemens SGT5-2000E Turbine	Checksheets Reference #:	V94-2-3802-4
Page #:		2 of 6	
Project #:		GOU.MB	
		Relevant Procedures:	240-136723367

		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: Darkish deposits noted

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NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE: 2022/09/13

**Check Sheet 39: Turbine 4<sup>th</sup> stage blades - VI**

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