
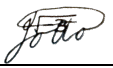

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	1 of 113		

Document Type	Inspection Report
Outage ID	24377
Scope of Activity	GT11 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
T Keyser SEM Turbine Engineering		2023-01-30

Revision Details		
Date	Revision	Area


Accepted		
Name/Designation	Signature	Date
P Mrubata Plant Manager OCGT		2023/01/30

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Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	2 of 113		

## SUMMARY

Gourikwa GT11 was removed from service on 30 August 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 August 30<sup>th</sup> until September 3<sup>rd</sup>. Areas inspected included: Compressor Inlet, Compressor Exhaust, Combustion Chambers, Turbine Inlet and the Turbine Exhaust. The filter house could not be inspected due to site being unable to facilitate access.

Additionally in order to address poor jacking oil lifts at the generator EE (based on the findings on the Generator TE bearing 2022/06/09) the bearing was opened for inspection and the jacking oil hose was replaced 27 September 2022.

## 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

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Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	3 of 113		


<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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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	4 of 113		

## UNIT INFORMATION

Date	Starts	Operating Hours	EOH	DOH
2022/08/30	2346	14005	38945	1146
Turbine Serial	Turbine Frame	Fuel(s)	Generator Serial	Generator Frame
800620	SGT5-2000E(6)	Fuel Oil	12008153	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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Form No.: 240-94066774 Rev 0



	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	5 of 113		

## TABLE OF CONTENTS


Section and Description:	Page:
DOCUMENT TITLE AND CONTROL PAGE -----	1
SUMMARY -----	2
LIST OF ABBREVIATIONS-----	2
UNIT INFORMATION -----	4
REFERENCES -----	4
TABLE OF CONTENTS -----	5
LIST OF FIGURES-----	6
LIST OF CHECKSHEETS -----	12
<b>1 EXECUTIVE SUMMARY OF FINDINGS -----</b>	<b>13</b>
<b>2 EXTERNAL INSPECTIONS -----</b>	<b>13</b>
2.1 GENERAL-----	13
2.2 IGNITION GAS -----	13
2.3 CONTROL OIL SKID-----	13
2.4 FUEL OIL SKID -----	14
2.5 LUBRICATING OIL AND JACKING OIL SKID-----	14
2.6 TURBINE -----	14
2.7 COMBUSTION CHAMBERS -----	15
2.8 GENERATOR -----	15
<b>3 AIR INTAKE SYSTEM -----</b>	<b>15</b>
3.1 FILTER HOUSE -----	15
3.2 COMPRESSOR INLET-----	15
<b>4 COMPRESSOR -----</b>	<b>16</b>
4.1 INLET-----	16
4.2.1 VLe0-----	16
4.2.2 VLa1-----	16
4.2 EXHAUST DIFFUSOR -----	17
<b>5 COMBUSTION -----</b>	<b>17</b>
5.1 LHS CC-----	17
5.1.1 Sight Glasses-----	17
5.1.2 Flame Tube-----	17
5.1.2.1 Diffusion Burners-----	17
5.1.2.2 Premix Burners-----	18
5.1.2.3 Ceramic Heat Shields-----	18
5.1.2.4 Dome Plates & Burner Inserts-----	18
5.1.3 Mixing Chamber-----	18
5.2 RHS CC-----	19
5.2.1 Sight Glasses-----	19
5.2.2 Flame Tube-----	19
5.2.2.1 Diffusion Burners-----	19

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Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	6 of 113		

5.2.2.2	Premix Burners	20
5.2.2.3	Ceramic Heat Shields	20
5.2.2.4	Dome Plates & Burner Inserts	20
5.2.3	Mixing Chamber	21
5.3	INNER CASING	21
6	TURBINE	21
6.1	INLET	21
6.2	OUTLET	22
7	EXHAUST	22
8	ACKNOWLEDGEMENTS	22
APPENDIX A		23
APPENDIX B		65

## LIST OF FIGURES

Figure 1: Structure	Error! Bookmark not defined.
Figure 2: Lube oil skid	Error! Bookmark not defined.
Figure 3: Lube oil skid	Error! Bookmark not defined.
Figure 4: Lube oil skid	Error! Bookmark not defined.
Figure 5: Lube oil skid	Error! Bookmark not defined.
Figure 6: Lube oil skid	Error! Bookmark not defined.
Figure 7: Lube oil skid	Error! Bookmark not defined.
Figure 8: Lube oil skid	Error! Bookmark not defined.
Figure 9: Lube oil skid	Error! Bookmark not defined.
Figure 10: Control oil skid	Error! Bookmark not defined.
Figure 11: Poorly supported pipe	Error! Bookmark not defined.
Figure 12: Purge water skid	Error! Bookmark not defined.
Figure 13: Fuel oil skid	Error! Bookmark not defined.
Figure 14: Fuel oil skid	Error! Bookmark not defined.
Figure 15: Fuel oil skid	Error! Bookmark not defined.
Figure 16: Fuel oil skid	Error! Bookmark not defined.
Figure 17: Cladding	Error! Bookmark not defined.
Figure 18: Cladding	Error! Bookmark not defined.
Figure 19: Cladding	Error! Bookmark not defined.
Figure 20: Oil seepage from premix bellow	Error! Bookmark not defined.
Figure 21: Burner overview	Error! Bookmark not defined.
Figure 22: Cladding overview	Error! Bookmark not defined.
Figure 23: Dome cladding	Error! Bookmark not defined.
Figure 24: Burner overview	Error! Bookmark not defined.
Figure 25: Burner overview	Error! Bookmark not defined.
Figure 26: Munters dryer pipes	Error! Bookmark not defined.
Figure 27: Air flap control rod	Error! Bookmark not defined.
Figure 28: Oil in compressor cone	Error! Bookmark not defined.
Figure 29: Unsupported jacking oil line	Error! Bookmark not defined.
Figure 30: Compressor inlet	Error! Bookmark not defined.

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Form No.: 240-94066774 Rev 0


	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	7 of 113		

Figure 31: Compressor inlet.....	Error! Bookmark not defined.
Figure 32: Compressor inlet cone .....	Error! Bookmark not defined.
Figure 33: Compressor inlet.....	Error! Bookmark not defined.
Figure 34: Compressor inlet.....	Error! Bookmark not defined.
Figure 35: Compressor inlet.....	Error! Bookmark not defined.
Figure 36: Compressor wash nozzles .....	Error! Bookmark not defined.
Figure 37: Compressor wash nozzle.....	Error! Bookmark not defined.
Figure 38: Compressor inlet.....	Error! Bookmark not defined.
Figure 39: VIGVs and compressor 1 <sup>st</sup> stage blades .....	Error! Bookmark not defined.
Figure 40: VIGVs and compressor 1 <sup>st</sup> stage blades .....	Error! Bookmark not defined.
Figure 41: VIGVs.....	Error! Bookmark not defined.
Figure 42: VIGVs.....	Error! Bookmark not defined.
Figure 43: VIGVs.....	Error! Bookmark not defined.
Figure 44: IC RHS support palm .....	Error! Bookmark not defined.
Figure 45: IC RHS support palm .....	Error! Bookmark not defined.
Figure 46: RHS MC CS key .....	Error! Bookmark not defined.
Figure 47: RHS MC bottom key .....	Error! Bookmark not defined.
Figure 48: IC bottom key .....	Error! Bookmark not defined.
Figure 49: IC bottom key .....	Error! Bookmark not defined.
Figure 50: IC drain.....	Error! Bookmark not defined.
Figure 51: LHS IC CS support palm.....	Error! Bookmark not defined.
Figure 52LHS IC CS support palm.....	Error! Bookmark not defined.
Figure 53: LHS MC CS key.....	Error! Bookmark not defined.
Figure 54: LHS MC bottom key.....	Error! Bookmark not defined.
Figure 55: Compressor exhaust diffusor .....	Error! Bookmark not defined.
Figure 56: Compressor exhaust diffusor .....	Error! Bookmark not defined.
Figure 57: Compressor exhaust diffusor .....	Error! Bookmark not defined.
Figure 58: CC1 ceramic tiles.....	Error! Bookmark not defined.
Figure 59: CC1 ceramic tiles.....	Error! Bookmark not defined.
Figure 60: CC1 ceramic tiles.....	Error! Bookmark not defined.
Figure 61: CC1 ceramic tiles.....	Error! Bookmark not defined.
Figure 62: CC1 ceramic tiles.....	Error! Bookmark not defined.
Figure 63: Burner 1-1 .....	Error! Bookmark not defined.
Figure 64: Burner 1-1 .....	Error! Bookmark not defined.
Figure 65: Burner 1-1 .....	Error! Bookmark not defined.
Figure 66: Burner 1-2 .....	Error! Bookmark not defined.
Figure 67: Burner 1-2 .....	Error! Bookmark not defined.
Figure 68: Burner 1-2 .....	Error! Bookmark not defined.
Figure 69: Burner 1-2 .....	Error! Bookmark not defined.
Figure 70: Burner 1-2 .....	Error! Bookmark not defined.
Figure 71: Burner 1-3 .....	Error! Bookmark not defined.
Figure 72: Burner 1-3 .....	Error! Bookmark not defined.
Figure 73: Burner 1-3 .....	Error! Bookmark not defined.
Figure 74: Burner 1-3 .....	Error! Bookmark not defined.
Figure 75: Burner 1-3 .....	Error! Bookmark not defined.
Figure 76: Burner 1-4 .....	Error! Bookmark not defined.
Figure 77: Burner 1-4 .....	Error! Bookmark not defined.

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Form No.: 240-94066774 Rev 0


	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	8 of 113		

Figure 78: Burner 1-4 .....	Error! Bookmark not defined.
Figure 79: Burner 1-4 .....	Error! Bookmark not defined.
Figure 80: Burner 1-4 .....	Error! Bookmark not defined.
Figure 81: Burner 1-4 .....	Error! Bookmark not defined.
Figure 82: Burner 1-5 .....	Error! Bookmark not defined.
Figure 83: Burner 1-5 .....	Error! Bookmark not defined.
Figure 84: Burner 1-5 .....	Error! Bookmark not defined.
Figure 85: Burner 1-5 .....	Error! Bookmark not defined.
Figure 86: Burner 1-6 .....	Error! Bookmark not defined.
Figure 87: Burner 1-6 .....	Error! Bookmark not defined.
Figure 88: Burner 1-6 .....	Error! Bookmark not defined.
Figure 89: Burner 1-6 .....	Error! Bookmark not defined.
Figure 90: Burner 1-6 .....	Error! Bookmark not defined.
Figure 91: Burner 1-6 .....	Error! Bookmark not defined.
Figure 92: Burner 1-6 .....	Error! Bookmark not defined.
Figure 93: Burner 1-6 .....	Error! Bookmark not defined.
Figure 94: Burner 1-6 .....	Error! Bookmark not defined.
Figure 95: Burner 1-6 .....	Error! Bookmark not defined.
Figure 96: Burner 1-6 .....	Error! Bookmark not defined.
Figure 97: Burner 1-6 .....	Error! Bookmark not defined.
Figure 98: Burner 1-6 .....	Error! Bookmark not defined.
Figure 99: Burner 1-6 .....	Error! Bookmark not defined.
Figure 100: Burner 1-7.....	Error! Bookmark not defined.
Figure 101: Burner 1-7.....	Error! Bookmark not defined.
Figure 102: Burner 1-7.....	Error! Bookmark not defined.
Figure 103: Burner 1-7.....	Error! Bookmark not defined.
Figure 104: Burner 1-7.....	Error! Bookmark not defined.
Figure 105: Burner 1-7.....	Error! Bookmark not defined.
Figure 106: Burner 1-7.....	Error! Bookmark not defined.
Figure 107: Burner 1-7.....	Error! Bookmark not defined.
Figure 108: Burner 1-7.....	Error! Bookmark not defined.
Figure 109: Burner 1-7.....	Error! Bookmark not defined.
Figure 110: Burner 1-8.....	Error! Bookmark not defined.
Figure 111: Burner 1-8.....	Error! Bookmark not defined.
Figure 112: Burner 1-8.....	Error! Bookmark not defined.
Figure 113: Burner 1-8.....	Error! Bookmark not defined.
Figure 114: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 115: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 116: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 117: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 118: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 119: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 120: CC2 ceramic tiles.....	Error! Bookmark not defined.
Figure 121: Stripped bolt .....	Error! Bookmark not defined.
Figure 122: Burner 2-1.....	Error! Bookmark not defined.
Figure 123: Burner 2-1.....	Error! Bookmark not defined.
Figure 124: Burner 2-1.....	Error! Bookmark not defined.

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Form No.: 240-94066774 Rev 0


	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	9 of 113		

Figure 125: Burner 2-2.....	Error! Bookmark not defined.
Figure 126: Burner 2-2.....	Error! Bookmark not defined.
Figure 127: Burner 2-2.....	Error! Bookmark not defined.
Figure 128: Burner 2-2.....	Error! Bookmark not defined.
Figure 129: Burner 2-2.....	Error! Bookmark not defined.
Figure 130: Burner 2-2.....	Error! Bookmark not defined.
Figure 131: Burner 2-2.....	Error! Bookmark not defined.
Figure 132: Burner 2-2.....	Error! Bookmark not defined.
Figure 133: Burner 2-3.....	Error! Bookmark not defined.
Figure 134: Burner 2-3.....	Error! Bookmark not defined.
Figure 135: Burner 2-3.....	Error! Bookmark not defined.
Figure 136: Burner 2-3.....	Error! Bookmark not defined.
Figure 137: Burner 2-3.....	Error! Bookmark not defined.
Figure 138: Burner 2-3.....	Error! Bookmark not defined.
Figure 139: Burner 2-3.....	Error! Bookmark not defined.
Figure 140: Burner 2-4.....	Error! Bookmark not defined.
Figure 141: Burner 2-4.....	Error! Bookmark not defined.
Figure 142: Burner 2-4.....	Error! Bookmark not defined.
Figure 143: Burner 2-4.....	Error! Bookmark not defined.
Figure 144: Burner 2-4.....	Error! Bookmark not defined.
Figure 145: Burner 2-4.....	Error! Bookmark not defined.
Figure 146: Burner 2-4.....	Error! Bookmark not defined.
Figure 147: Burner 2-4.....	Error! Bookmark not defined.
Figure 148: Burner 2-4.....	Error! Bookmark not defined.
Figure 149: Burner 2-4.....	Error! Bookmark not defined.
Figure 150: Burner 2-4.....	Error! Bookmark not defined.
Figure 151: Burner 2-4.....	Error! Bookmark not defined.
Figure 152: Burner 2-5.....	Error! Bookmark not defined.
Figure 153: Burner 2-5.....	Error! Bookmark not defined.
Figure 154: Burner 2-5.....	Error! Bookmark not defined.
Figure 155: Burner 2-5.....	Error! Bookmark not defined.
Figure 156: Burner 2-5.....	Error! Bookmark not defined.
Figure 157: Burner 2-6.....	Error! Bookmark not defined.
Figure 158: Burner 2-6.....	Error! Bookmark not defined.
Figure 159: Burner 2-6.....	Error! Bookmark not defined.
Figure 160: Burner 2-6.....	Error! Bookmark not defined.
Figure 161: Burner 2-6.....	Error! Bookmark not defined.
Figure 162: Burner 2-6.....	Error! Bookmark not defined.
Figure 163: Burner 2-7.....	Error! Bookmark not defined.
Figure 164: Burner 2-7.....	Error! Bookmark not defined.
Figure 165: Burner 2-7.....	Error! Bookmark not defined.
Figure 166: Burner 2-7.....	Error! Bookmark not defined.
Figure 167: Burner 2-7.....	Error! Bookmark not defined.
Figure 168: Burner 2-7.....	Error! Bookmark not defined.
Figure 169: Burner 2-8.....	Error! Bookmark not defined.
Figure 170: Burner 2-8.....	Error! Bookmark not defined.
Figure 171: Burner 2-8.....	Error! Bookmark not defined.

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Form No.: 240-94066774 Rev 0


	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	10 of 113		

Figure 172: CC1 IC hub.....	Error! Bookmark not defined.
Figure 173: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 174: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 175: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 176: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 177: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 178: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 179: CC1 MC to FT interface.....	Error! Bookmark not defined.
Figure 180: CC1 MC TS bushing support.....	Error! Bookmark not defined.
Figure 181: CC1 MC CS bushing support.....	Error! Bookmark not defined.
Figure 182: CC1 MC.....	Error! Bookmark not defined.
Figure 183: CC1 MC.....	Error! Bookmark not defined.
Figure 184: CC1 MC to IC interface.....	Error! Bookmark not defined.
Figure 185: CC1 MC to IC interface.....	Error! Bookmark not defined.
Figure 186: CC1 MC to IC interface.....	Error! Bookmark not defined.
Figure 187: CC1 MC to IC interface.....	Error! Bookmark not defined.
Figure 188: CC1 MC to IC interface.....	Error! Bookmark not defined.
Figure 189: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 190: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 191: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 192: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 193: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 194: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 195: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 196: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 197: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 198: CC2 MC to FT interface.....	Error! Bookmark not defined.
Figure 199: CC2 MC TS support bushing.....	Error! Bookmark not defined.
Figure 200: CC2 MC.....	Error! Bookmark not defined.
Figure 201: CC2 MC.....	Error! Bookmark not defined.
Figure 202: CC2 MC manhole collar.....	Error! Bookmark not defined.
Figure 203: CC2 MC manhole collar.....	Error! Bookmark not defined.
Figure 204: CC2 MC manhole collar.....	Error! Bookmark not defined.
Figure 205: CC2 MC CS support bushing.....	Error! Bookmark not defined.
Figure 206: CC2 MC to IC interface.....	Error! Bookmark not defined.
Figure 207: CC2 MC to IC interface.....	Error! Bookmark not defined.
Figure 208: CC2 MC to IC interface.....	Error! Bookmark not defined.
Figure 209: CC2 MC to IC interface.....	Error! Bookmark not defined.
Figure 210: CC2 MC to IC interface.....	Error! Bookmark not defined.
Figure 211: CC2 MC to IC interface.....	Error! Bookmark not defined.
Figure 212: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 213: Turbine inlet.....	Error! Bookmark not defined.
Figure 214: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 215: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 216: Turbine 1 <sup>st</sup> stage blades.....	Error! Bookmark not defined.
Figure 217: Turbine 1 <sup>st</sup> stage blades.....	Error! Bookmark not defined.
Figure 218: Turbine 1 <sup>st</sup> stage blades.....	Error! Bookmark not defined.

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Form No.: 240-94066774 Rev 0


	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	11 of 113		

Figure 219: Turbine 1 <sup>st</sup> stage blades.....	Error! Bookmark not defined.
Figure 220: Turbine 1 <sup>st</sup> stage vanes - shroud.....	Error! Bookmark not defined.
Figure 221: Turbine 1 <sup>st</sup> stage vanes - shroud.....	Error! Bookmark not defined.
Figure 222: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 223: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 224: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 225: Turbine 1 <sup>st</sup> stage vanes.....	Error! Bookmark not defined.
Figure 226: Chip in TBC .....	Error! Bookmark not defined.
Figure 227: Turbine 1 <sup>st</sup> stage vanes - shroud.....	Error! Bookmark not defined.
Figure 228: Turbine 1 <sup>st</sup> stage blades – possible rubbing .....	Error! Bookmark not defined.
Figure 229: Turbine 1 <sup>st</sup> stage blades – possible rubbing .....	Error! Bookmark not defined.
Figure 230: Turbine 1 <sup>st</sup> stage blades – possible rubbing .....	Error! Bookmark not defined.
Figure 231: Turbine 4 <sup>th</sup> stage blades.....	Error! Bookmark not defined.
Figure 232: Turbine 4 <sup>th</sup> stage blades.....	Error! Bookmark not defined.
Figure 233: Turbine 4 <sup>th</sup> stage blades.....	Error! Bookmark not defined.
Figure 234: Turbine 4 <sup>th</sup> stage blades.....	Error! Bookmark not defined.
Figure 235: Turbine 4 <sup>th</sup> stage blades.....	Error! Bookmark not defined.
Figure 236: Turbine 4 <sup>th</sup> stage blades.....	Error! Bookmark not defined.
Figure 237: Exhaust manhole door cushion .....	Error! Bookmark not defined.
Figure 238: Loose objects in exhaust .....	Error! Bookmark not defined.
Figure 239: Loose objects in exhaust .....	Error! Bookmark not defined.
Figure 240: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 241: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 242: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 243: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 244: Example of rubbing in exhaust.....	Error! Bookmark not defined.
Figure 245: Exhaust .....	Error! Bookmark not defined.
Figure 246: Exhaust .....	Error! Bookmark not defined.
Figure 247: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 248: Crack in turbine bearing hub plate .....	Error! Bookmark not defined.
Figure 249: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 250: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 251: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 252: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 253: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 254: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 255: Example of crack in exhaust .....	Error! Bookmark not defined.
Figure 256: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 257: Example of cracks in turbine bearing hub support.....	Error! Bookmark not defined.
Figure 258: Example of crack in turbine bearing hub .....	Error! Bookmark not defined.


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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0



	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	12 of 113		

## LIST OF CHECKSHEETS

Check Sheet 1: Leak Check - VI.....	Error! Bookmark not defined.
Check Sheet 2: Leak check - VI.....	Error! Bookmark not defined.
Check Sheet 3: Insulation - VI .....	Error! Bookmark not defined.
Check Sheet 4: CC1 VI.....	Error! Bookmark not defined.
Check Sheet 5: CC2 VI.....	Error! Bookmark not defined.
Check Sheet 6: Leak check - VI.....	Error! Bookmark not defined.
Check Sheet 7: Insulation - VI .....	Error! Bookmark not defined.
Check Sheet 8: Insulation - VI .....	Error! Bookmark not defined.
Check Sheet 9: Leak check - VI.....	Error! Bookmark not defined.
Check Sheet 10: Insulation - VI .....	Error! Bookmark not defined.
Check Sheet 11: Filter house - VI .....	Error! Bookmark not defined.
Check Sheet 12: Compressor inlet systems - VI.....	Error! Bookmark not defined.
Check Sheet 13: Compressor inlet systems - VI.....	Error! Bookmark not defined.
Check Sheet 14: Compressor stage 1 radial blade tip clearances.....	Error! Bookmark not defined.
Check Sheet 15: Compressor diffuser - VI.....	Error! Bookmark not defined.
Check Sheet 16: CC1 FT - VI .....	Error! Bookmark not defined.
Check Sheet 17: CC1 ceramic tile inspection .....	Error! Bookmark not defined.
Check Sheet 18: CC2 FT - VI .....	Error! Bookmark not defined.
Check Sheet 19: CC2 ceramic tile inspection .....	Error! Bookmark not defined.
Check Sheet 20: CC1 burner alignment.....	Error! Bookmark not defined.
Check Sheet 21: CC1 dome plate alignment .....	Error! Bookmark not defined.
Check Sheet 22: CC1 burner assembly - VI.....	Error! Bookmark not defined.
Check Sheet 23: CC1 Diffusion burners - VI .....	Error! Bookmark not defined.
Check Sheet 24: CC1 Premix burners - VI.....	Error! Bookmark not defined.
Check Sheet 25: CC2 Burner alignment .....	Error! Bookmark not defined.
Check Sheet 26: CC2 dome plate alignment .....	Error! Bookmark not defined.
Check Sheet 27: CC2 Burner assembly - VI .....	Error! Bookmark not defined.
Check Sheet 28: Dome plates - VI.....	Error! Bookmark not defined.
Check Sheet 29: CC2 Diffusion burners - VI .....	Error! Bookmark not defined.
Check Sheet 30: CC2 Premix burners - VI.....	Error! Bookmark not defined.
Check Sheet 31: CC1 MC - VI.....	Error! Bookmark not defined.
Check Sheet 32: CC1 MC - VI .....	Error! Bookmark not defined.
Check Sheet 33: CC2 MC - VI .....	Error! Bookmark not defined.
Check Sheet 34: CC2 MC - VI .....	Error! Bookmark not defined.
Check Sheet 35: MC to IC clearances .....	Error! Bookmark not defined.
Check Sheet 36: FT to MC clearances .....	Error! Bookmark not defined.
Check Sheet 37: IC - VI .....	Error! Bookmark not defined.
Check Sheet 38: Turbine 1 <sup>st</sup> stage vanes - VI .....	Error! Bookmark not defined.
Check Sheet 39: Turbine 1 <sup>st</sup> stage blades - VI .....	Error! Bookmark not defined.
Check Sheet 40: Turbine radial blade tip clearances .....	Error! Bookmark not defined.
Check Sheet 41: Exhaust casing - VI.....	Error! Bookmark not defined.
Check Sheet 42: Exhaust casing to cover plate clearances .....	Error! Bookmark not defined.
Check Sheet 43: Downstream of exhaust casing - VI.....	Error! Bookmark not defined.
Check Sheet 44: Turbine 4 <sup>th</sup> stage blades - VI.....	Error! Bookmark not defined.


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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0



	<b>Business Management System</b> <b>Inspection Report</b> <b>Gourikwa – GT11 Minor</b> <b>Inspection</b>	<b>Document Identifier</b>	194/1353	<b>Rev</b>	0
		<b>Date</b>	30/01/2023		
		<b>Page</b>	13 of 113		

## 1 EXECUTIVE SUMMARY OF FINDINGS

Section	Findings	Corrective Measures
2.1	Turbine and generator hall structure significantly corroded	Corrosion maintenance plan to be addressed
2.8	Generator EE bearing jacking oil hose was found perished.	Jacking oil hose was replaced by ERI.
3.1	Filter house structure and components found with significant corrosion.	Corrosion evaluation to be performed.
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
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	No action – monitor at next MI

## 2 EXTERNAL INSPECTIONS

### 2.1 General

Finding(s):

- General corrosion on cladding noted.
- Cladding is filthy.
- Structure has several areas of heavy corrosion.
  - Generator roof noted to have heavy corrosion.

Corrective Measure(s):

- No remedial action required – to be monitored during the next MI.
- Housekeeping to be improved.
- Corrosion analysis and intervention plan required.

### 2.2 Ignition Gas

No anomalies noted

### 2.3 Control Oil Skid

Finding(s):

- Dirt on skid.
- Coupling spacer damaged.


Corrective Measure(s):

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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	14 of 113		

1. Site to clean skid.
2. Spacer was replaced.

## 2.4 Fuel Oil Skid

Finding(s):

1. Some oil noted on skid.
2. Missing plugs on 11MBN13CT401 & 11MBN17CT401.

Corrective Measure(s):

1. Site to clean skid and report any leaks if noted.
2. Site to ensure FME standards are adhered to and install plugs.

## 2.5 Lubricating Oil and Jacking Oil Skid

Finding(s):

1. Oil near mist separator – drip tray present.
2. Oil on the skid in the vicinity of the coolers.
3. Oil near filters – drip tray present.
4. Oil seepage noted around the jacking oil pumps.
5. Jacking oil line in compressor cone is unsupported.

Corrective Measure(s):

1. Site to clean. Leak identification and repair to be scheduled for the next MO.
2. Site to clean skid and report leaks if noted.
3. Site to clean. Leak identification and repair to be scheduled for the next MO.
4. Site to clean skid and report leaks if noted.
5. Site to install adequate support bracket<sup>1</sup>.

## 2.6 Turbine

Finding(s):


1. CC drain line pipes overheated and discoloured.
2. Rubber seal (turbine external cladding) at the wall was still pulling away – but in a similar condition to the previous MI.

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. To be monitored during the next MI.

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

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	15 of 113		

## 2.7 Combustion Chambers

Finding(s):

1. White residue on outside cladding.
2. General corrosion and flaking of paint noted on all burners.
3. Protective rubber cladding around dome cladding is falling out of position.
4. Minor seepage noted at premix expansion bellows for burners 1-2, 2-8.

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 source material for replacement during the next MO.
4. No corrective action as of yet – to be monitored during the next MI.

## 2.8 Generator

EE bearing was opened and the jacking oil line was found to have been perished. The flexible was replaced.

Recommendations:

- Some overheating was visible in the white-metal; site to schedule bearing refurbishment during the next MO.
- Site to procure shaft-raising gear for EE and TE to simplify and increase safety during bearing-related activities.
- Site to ensure qualification of overhead lifting beam – scaffolding was costly, reduces available space, and increases time taken to execute activities.
- Site will require new oil baffles as clearances are above specification.
  - Baffle rig to be generated in order to ensure correct dimensions are obtained.

## 3 AIR INTAKE SYSTEM

### 3.1 Filter House

Finding(s):

1. Significant corrosion noted.
  - a. Drain pipe supports are extremely corroded and some have broken.
2. Coalescing filters out of position & dirty.
3. Clean room dirty and contains liquid.
4. Corrosion and flaking of paint noted.
5. Light test failed in the vicinity of 1 filter.

Corrective Measure(s):


1. Corrosion evaluation to be done, and site to plan for intervention.

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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	16 of 113		

- a. Site to replace drain pipe supports and ensure that the material used has a greater corrosion resistance.
2. Coalescing filters were replaced by site.
3. Cleaned by site.
4. Site to apply corrosion resistant paint at affected locations.
5. Filter was removed and reinstalled by site to rectify the seal.

### 3.2 Compressor Inlet

Finding(s):

1. Compressor Air Inlet cone gasket saturated with oil, likely due to seepage from lube oil drain flange internally to the cone.
2. Internal corrosion noted.
3. Intake cone dirty.
4. Some bubbling of paint noted.

Corrective Measure(s):

1. Possibly indicative of a leak - to be monitored during the next MI.
2. Corrosion protection to be applied and the affected areas to be re-painted. Additionally site to ensure Munters dryer is operated as required in order to prevent humidity in the inlet area.
3. Site to clean – to be monitored during the next MI.
4. Site to clean and re-paint at the next available opportunity. Site also to ensure that compressor wash cleaning agent has been adequately rinsed.

## 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.

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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	17 of 113		

- Radial blade tip clearance on RHS measured below specification , however no rubbing was observed in the vicinity.

Corrective Measure(s):

- Perform compressor washing.
- No remedial action required – to be monitored during the next MI.
- No remedial action required – to be monitored during the next MI. Readings similar to the previous MI.

## 4.2 Exhaust Diffusor

No anomalies noted.

## 5 COMBUSTION

### 5.1 LHS CC

#### 5.1.1 Sight Glasses

Finding(s):

- Manhole sight glass dirty.
- 1 off sight glass in FT found damaged.

Corrective Measure(s):

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

#### 5.1.2 Flame Tube

Finding(s):

- Overheating of tile support ring in several areas.
- Overheating of dome plate support ring in some areas.
- Some cracks noted in dome plate support ring.

Corrective Measure(s):

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

#### 5.1.2.1 Diffusion Burners

Finding(s):

- Coking noted on all burner caps and several axial swirlers.
- Some erosion noted on axial swirlers of burners 1-1, 1-8.

Corrective Measure(s):


- Coking cleaned during MI.

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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	18 of 113		

2. No remedial action – to be monitored during the next MI. Site to plan for refurbishment of the 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. Significant overheating on the premix bell of burner 1-6 and 1-7 resulting in cracks.

##### 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.

#### 5.1.2.3 Ceramic Heat Shields

##### Finding(s)<sup>2</sup>:

1. No tiles were found with defects outside of the tolerable limits.
2. Some missing material noted on tile B8 – however no intervention is required, to be monitored during the next MI.

#### 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 1-1, 1-4, 1-6, 1-7 and 1-8. Mechanical damage on BIR 1-1 was also observed.
3. Deformation noted of hot-side dome plates 1-1, 1-4, 1-6, and 1-7.


##### 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. Burner 1-6 will require replacement during the next MO.
3. No remedial action – to be monitored during the next MI.

#### 5.1.3 Mixing Chamber

##### Finding(s):

<sup>2</sup> Tolerable limits as defined in: 37-1345-52KE00-DE-2013-12-003|004|005|006|007

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	19 of 113		

1. Hammering noted between Flame Tube and Mixing Chamber {at castellations 3, 4-5, 7, 8-9, 15-18, 19-20, 21, 27, 28, 30-31, 32-33}.
2. Average “t” between the FT and MC is below specification.
3. Hammering noted between Mixing Chamber and Inner Casing {at IC castellations 15, 16-14}.
4. Slight rubbing of manhole insert at collar noted.
5. 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 significant variation determined when compared to the previous MI. 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 significant variation determined when compared to the previous MI. 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.
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 burners 2-1 and 2-7.
3. Cracks noted in axial swirlers of burners 2-1 and 2-3.

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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	20 of 113		

Corrective Measure(s):

1. Coking cleaned during MI.
2. To be monitored during the next MI.
3. To be monitored during the next MI.

#### 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, 2-4 and 2-6 resulting in missing material and cracks.
5. Blocked nozzles noted on burners 2-3 and 2-4.

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 MI.
5. Blockages cleared by site.

#### 5.2.2.3 Ceramic Heat Shields

Finding(s)<sup>3</sup>:

1. No tiles were found with defects outside of the tolerable limits.
2. Hexagonal bolt that was identified as stripped during the previous MI could not be replaced. Intervention during MO required.

#### 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 2-3, 2-4, 2-7.
3. Deformation noted on plates 2-1, 2-2, 2-4 and 2-8.

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.

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



	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	21 of 113		

### 5.2.3 Mixing Chamber

#### Finding(s):

1. Hammering noted between Flame Tube and Mixing Chamber Chamber {at castellations 7-11, 13, 15, 17-20, 21, 23, 25-30, 31, 33}.
2. Average “t” between the FT and MC is below specification.
3. Hammering noted between Mixing Chamber and Inner Casing {at IC castellations 12-13, 14-16, 19-11}.
4. Clearance “B” between MC and IC below specification.
5. Slight rubbing of manhole insert as well as cracks at collar noted.
6. Slight mechanical damage noted on the cooling air ring.

#### Corrective Measure(s):

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

## 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.

#### Corrective Measure(s):

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. Slightly darker than normal discoloration of TLe1 and TLa1 TBC observed.
2. Minor flaking of TBC on some TLa1 blades observed.
3. Almost all radial blade tip clearances were measured to be tight.

#### Corrective Measure(s):


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

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Document printed on: 30/01/2023

Form No.: 240-94066774 Rev 0

	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	22 of 113		

3. 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.
2. High LE  $\Delta S$  measured on radial blade tip clearances on the LHS.
3. Mottled deposits noted on the 4<sup>th</sup> stage blades and vanes, however the blades appeared quite clean.

Corrective Measure(s):

1. No remedial action required – to be monitored during the next MI<sup>4</sup>.
2. No remedial action required – to be monitored during the next MI<sup>5</sup>.
3. Water content in fuel to be investigated.

## 7 EXHAUST

Finding(s):

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, 1<sup>st</sup> and 2<sup>nd</sup> expansion joint plates.
3. White deposits noted as well as mottled deposits.

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. Water content in fuel to be investigated

## 8 ACKNOWLEDGEMENTS

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

<sup>4</sup> Measurements similar to what was recorded during the previous MI and as such not indicative of deterioration.

<sup>5</sup> Measurements similar to what was recorded during the previous MI and as such not indicative of deterioration.

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Form No.: 240-94066774 Rev 0

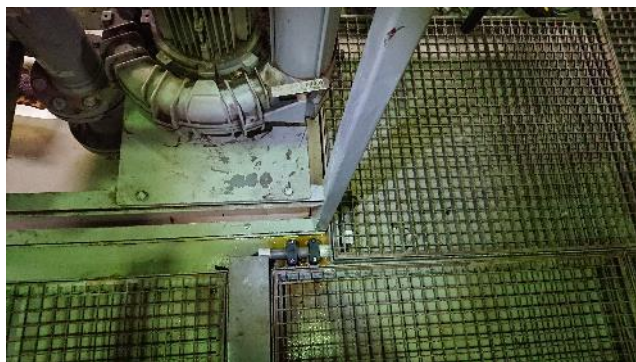
## APPENDIX A



**Figure 1: Lubricating oil skid**



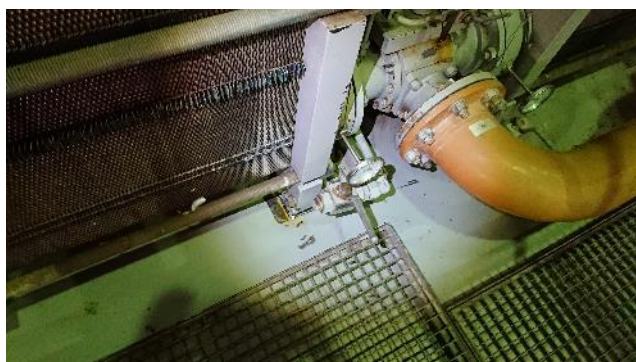
**Figure 5: Lubricating oil skid**



**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: Slube oil skid**

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**Figure 9: Lubricating oil skid**



**Figure 13: Fuel oil skid**



**Figure 10: Lubricating oil skid**



**Figure 14: Fuel oil skid**



**Figure 11: Unsupported pipe**



**Figure 15: Fuel oil skid**



**Figure 12: Purge water skid**



**Figure 16: Fuel oil skid**

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**Figure 17: Fuel oil skid**



**Figure 18: Fuel oil skid**



**Figure 19: Fuel oil skid**



**Figure 20: Ignition gas skid**



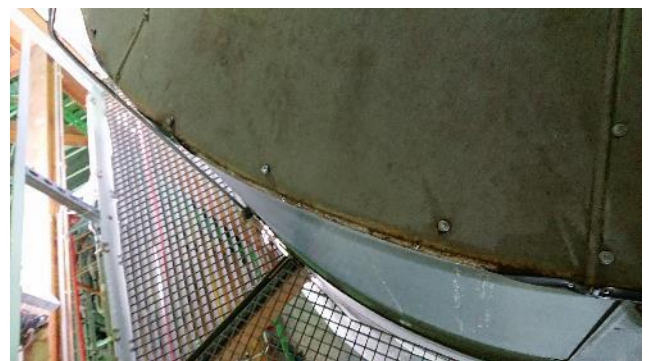
**Figure 21: Cladding**



**Figure 22: Cladding**



**Figure 23: Cladding**



**Figure 24: Cladding**

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**Figure 25: Burner overview**



**Figure 29: Burner overview**



**Figure 26: Burner overview**



**Figure 30: Cladding**



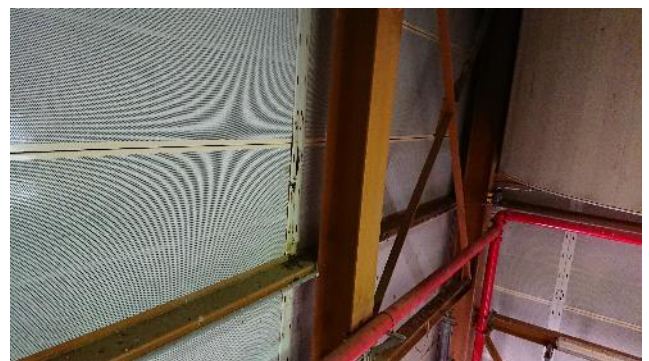
**Figure 27: Cladding**



**Figure 31: Structure**



**Figure 28: Cladding**



**Figure 32: Structure**

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Figure 33: Cladding



Figure 34: VIGV commander actuator



Figure 35: Munters dryer pipes



Figure 36: Compressor inlet nose-cone (internal)

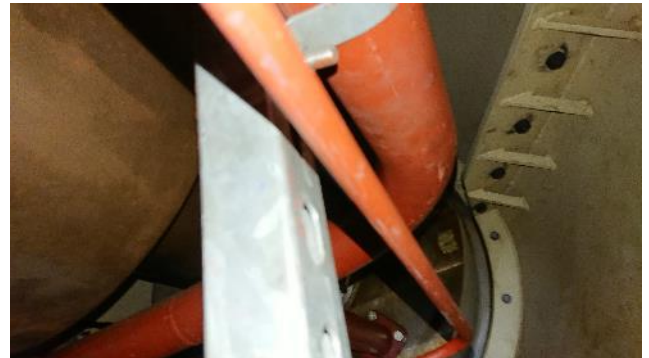


Figure 37: Compressor inlet nose-cone (internal)



Figure 38: SSS clutch



Figure 39: Generator TE bearing



Figure 40: Generator TE bearing

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**Figure 41: Generator EE bearing**



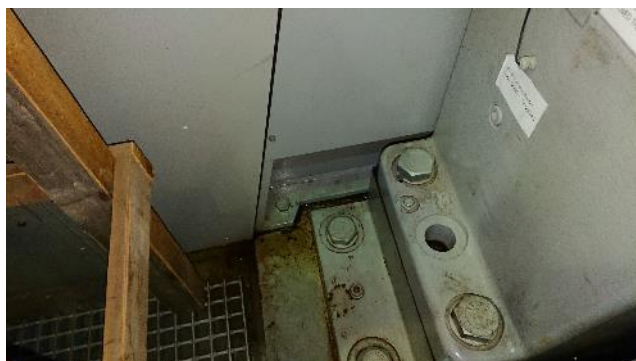
**Figure 45: Generator EE bearing**



**Figure 42: Generator EE bearing**



**Figure 46: Control oil pump coupling spacer**



**Figure 43: Generator EE bearing**



**Figure 47: Old control oil pump coupling spacer**



**Figure 44: Tool used to raise shaft**



**Figure 48: Exciter making shaft lift difficult**

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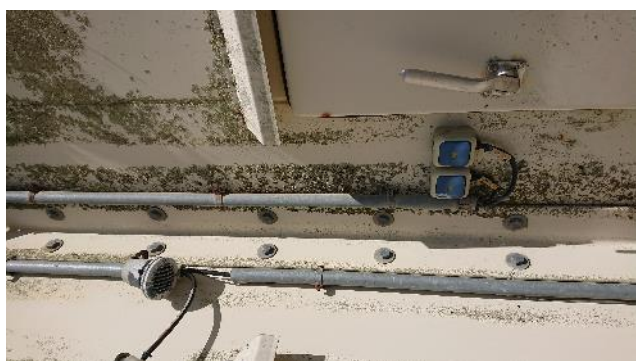




**Figure 49: Filter house**



**Figure 53: Coalescing filters**



**Figure 50: Filter house**



**Figure 54: Pre-filters**



**Figure 51: Filter house**



**Figure 55: Pre-filters**



**Figure 52: Coalescing filters**



**Figure 56: Pre-filters**

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**Figure 57: Pre-filters**



**Figure 61: Pre-filters**



**Figure 58: Pre-filters**



**Figure 62: Pre-filters**



**Figure 59: Coalescing filters**



**Figure 63: Coalescing filters**



**Figure 60: Pre-filters**



**Figure 64: Pre-filters**

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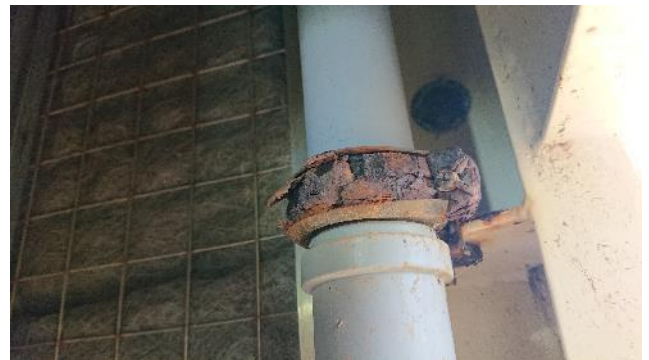
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**Figure 65: Coalescing filters**



**Figure 69: Filter house**



**Figure 66: Pre-filters**



**Figure 70: Filter house**



**Figure 67: Pre-filters**



**Figure 71: Filter house**



**Figure 68: Filter house**



**Figure 72: Filter house**

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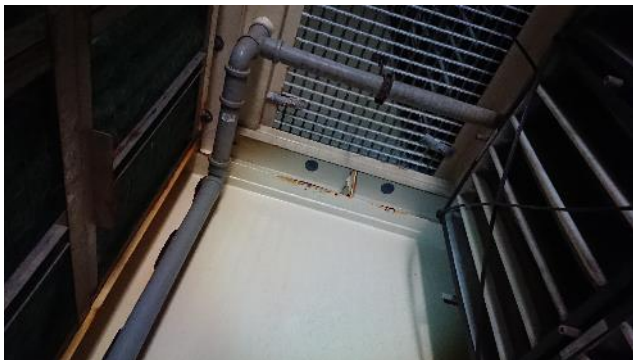




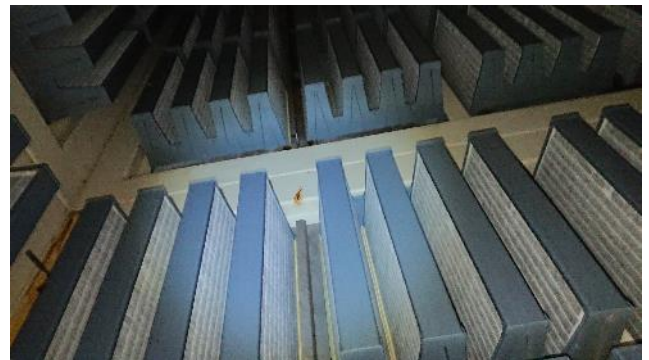
**Figure 73: Filter house**



**Figure 77: Clean room**



**Figure 74: Filter house**



**Figure 78: Clean room**



**Figure 75: Clean room**



**Figure 79: Clean room**



**Figure 76: Clean room**



**Figure 80: Clean room**

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**Figure 81: Clean room**



**Figure 85: Clean room**



**Figure 82: Clean room**



**Figure 86: Clean room**



**Figure 83: Clean room**



**Figure 87: Clean room**



**Figure 84: Clean room**



**Figure 88: Clean room**

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**Figure 89: Clean room**



**Figure 93: Clean room**



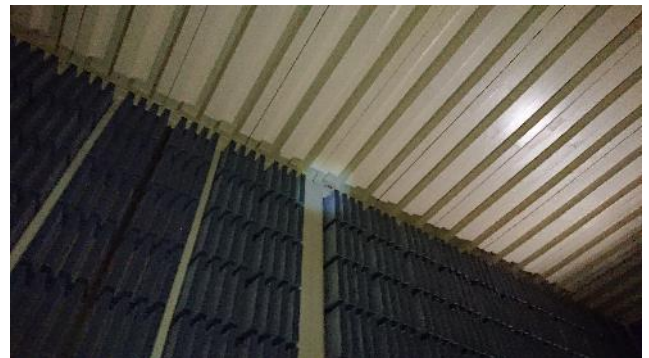
**Figure 90: Clean room**



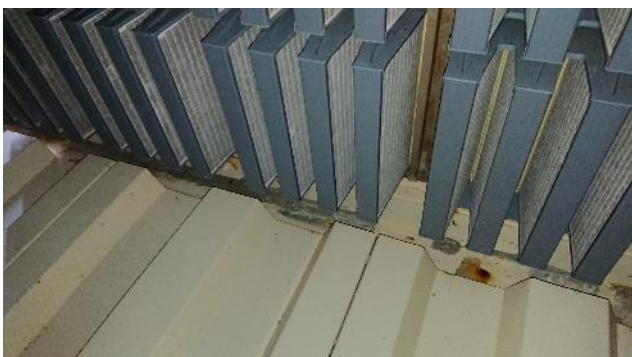
**Figure 94: Clean room**



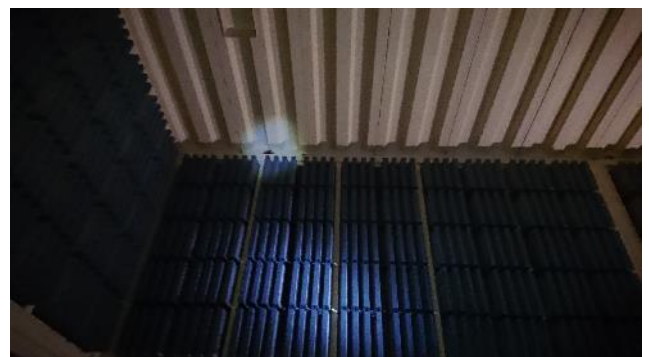
**Figure 91: Clean room**



**Figure 95: Clean room**



**Figure 92: Clean room**



**Figure 96: Clean room**

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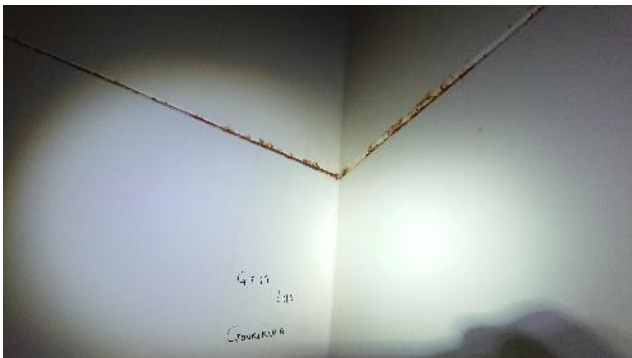
**Figure 97: Generator hall roof**



**Figure 98: Generator hall roof**



**Figure 99: Generator hall roof**



**Figure 100: Compressor inlet**



**Figure 101: Compressor inlet**



**Figure 102: Compressor inlet**



**Figure 103: Compressor inlet**



**Figure 104: Compressor inlet**

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**Figure 105: Compressor inlet**



**Figure 109: Compressor inlet**



**Figure 106: Compressor inlet**



**Figure 110: Compressor inlet**



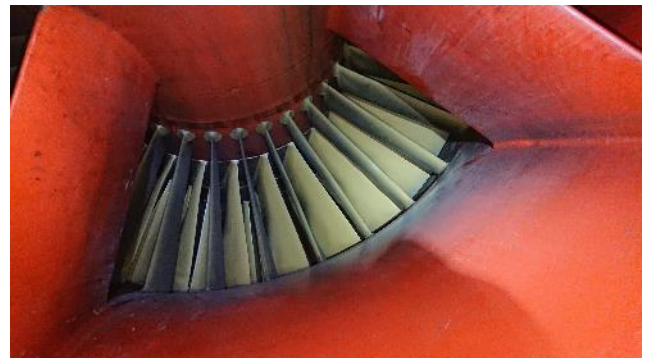
**Figure 107: Compressor inlet**



**Figure 111: VLe0**



**Figure 108: Compressor inlet**



**Figure 112: VLe0 & VLa1**

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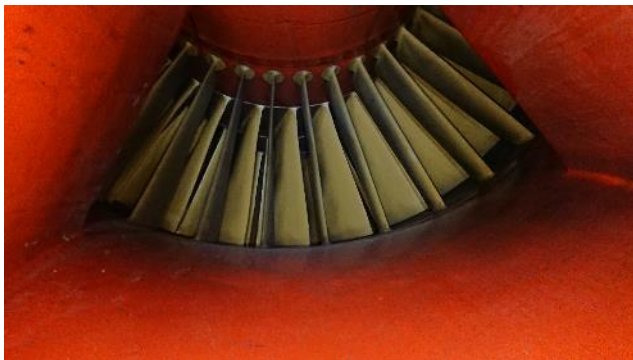


Figure 113: VLe0 & VLa1



Figure 117: VLe0 & VLa1



Figure 114: VLe0 & VLa1



Figure 118: IC bottom key



Figure 115: VLe0 & VLa1



Figure 119: IC drain



Figure 116: VLe0 & VLa1



Figure 120: CC2 IC CS support palm

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**Figure 121: CC2 IC CS support palm**



**Figure 125: CC1 IC CS support palm**



**Figure 122: CC2 MC CT guide**



**Figure 126: CC1 MC CS guide**



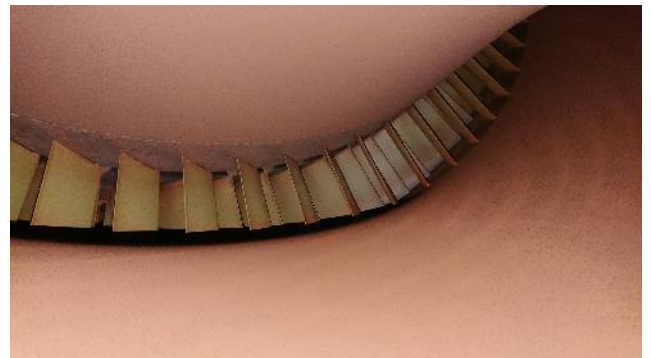
**Figure 123: CC2 MC bottom guide**



**Figure 127: CC1 MC bottom guide**



**Figure 124: CC1 IC CS support palm**



**Figure 128: Compressor exhaust**

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Figure 129: Compressor exhaust

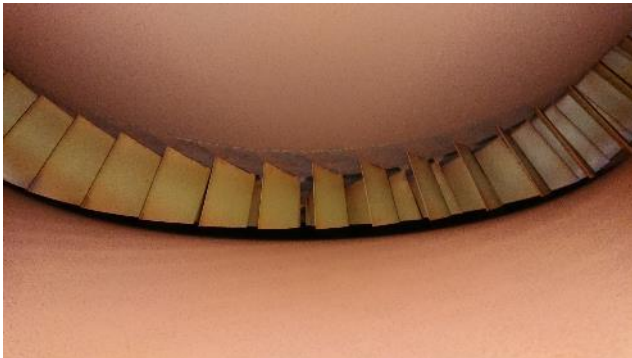


Figure 130: Compressor exhaust



Figure 131: CC1 ceramic tiles



Figure 132: CC1 ceramic tiles



Figure 133: CC1 ceramic tiles



Figure 134: CC1 ceramic tiles



Figure 135: CC1 dome plate support ring



Figure 136: CC1 dome plate support ring

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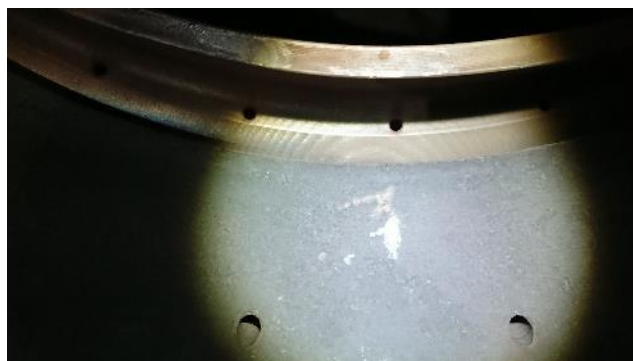
**Figure 137: CC1 dome plate support ring**



**Figure 141: Burner 1-1**



**Figure 138: Burner 1-1**



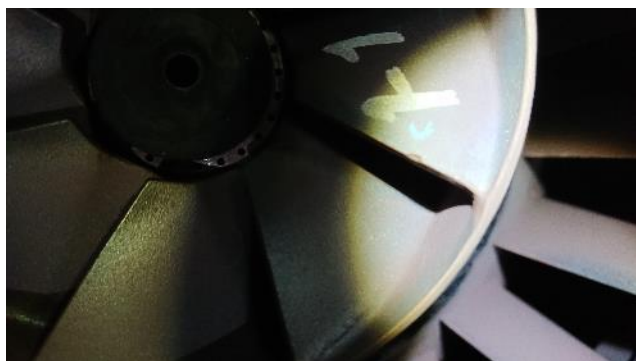
**Figure 142: Burner 1-1**



**Figure 139: Burner 1-1**



**Figure 143: Burner 1-2**



**Figure 140: Burner 1-1**



**Figure 144: Burner 1-2**

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**Figure 145: Burner 1-2**



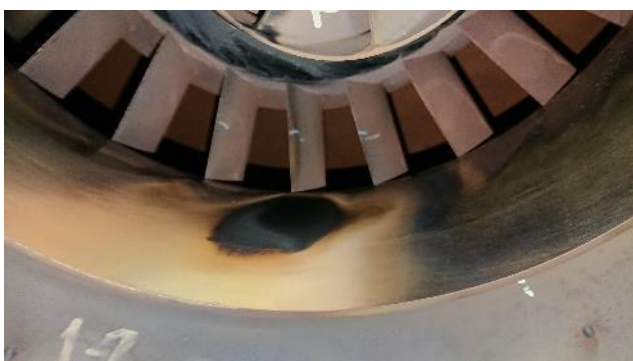
**Figure 149: Burner 1-3**



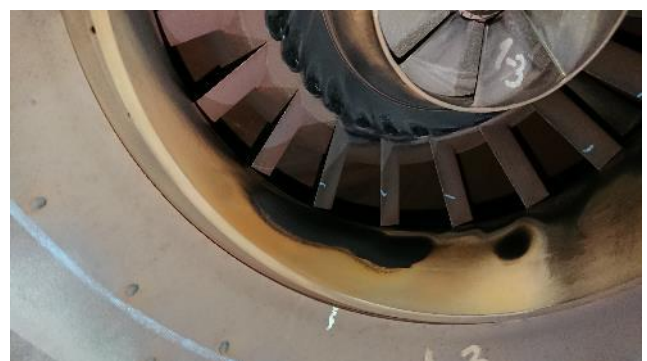
**Figure 146: Burner 1-2**



**Figure 150: Burner 1-3**



**Figure 147: Burner 1-2**



**Figure 151: Burner 1-3**



**Figure 148: Burner 1-3**



**Figure 152: Burner 1-3**

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**Figure 153: Burner 1-4**



**Figure 157: Burner 1-4**



**Figure 154: Burner 1-4**



**Figure 158: Burner 1-4**



**Figure 155: Burner 1-4**



**Figure 159: Burner 1-5**



**Figure 156: Burner 1-4**



**Figure 160: Burner 1-5**

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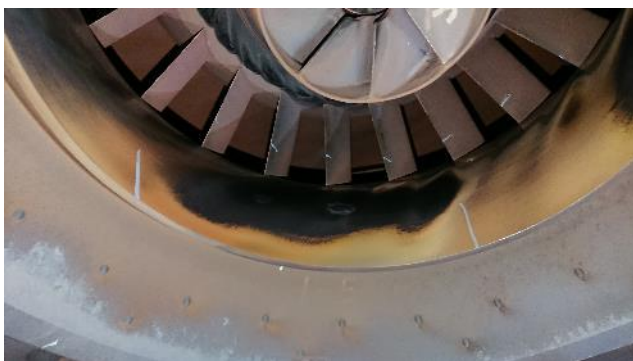




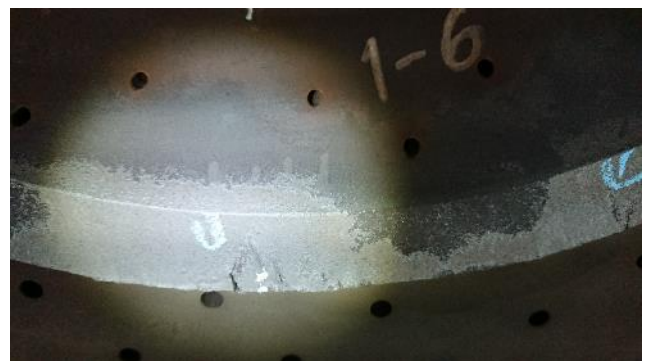
**Figure 161: Burner 1-5**



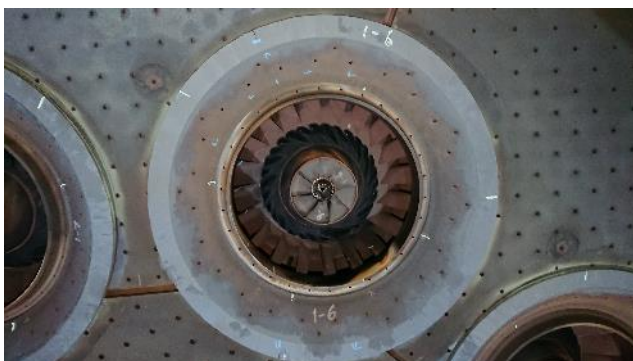
**Figure 165: Burner 1-6**



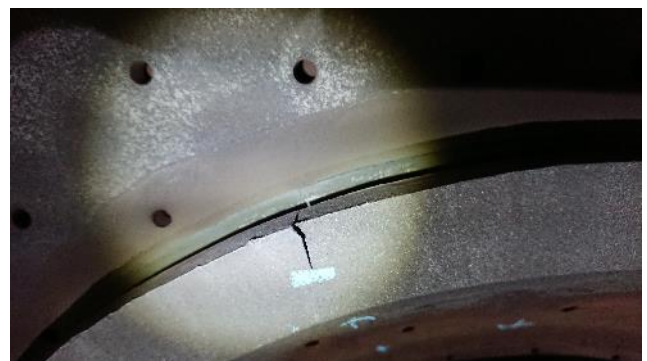
**Figure 162: Burner 1-5**



**Figure 166: Burner 1-6**



**Figure 163: Burner 1-6**



**Figure 167: Burner 1-6**



**Figure 164: Burner 1-6**



**Figure 168: Burner 1-6**

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**Figure 169: Burner 1-6**



**Figure 173: Burner 1-6**



**Figure 170: Burner 1-6**



**Figure 174: Burner 1-7**



**Figure 171: Burner 1-6**



**Figure 175: Burner 1-7**



**Figure 172: Burner 1-6**



**Figure 176: Burner 1-7**

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**Figure 177: Burner 1-7**



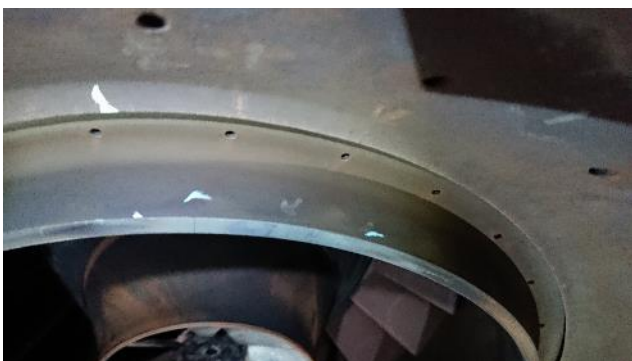
**Figure 181: Burner 1-8**



**Figure 178: Burner 1-7**



**Figure 182: Burner 1-8**



**Figure 179: Burner 1-7**



**Figure 183: Burner 1-8**



**Figure 180: Burner 1-7**



**Figure 184: Burner 1-8**

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Figure 185: Burner 1-8



Figure 189: CC2 ceramic tiles



Figure 186: Burner 1-8



Figure 190: CC2 ceramic tiles



Figure 187: CC2 ceramic tiles



Figure 191: CC2 ceramic tiles



Figure 188: CC2 ceramic tiles



Figure 192: CC2 ceramic tiles

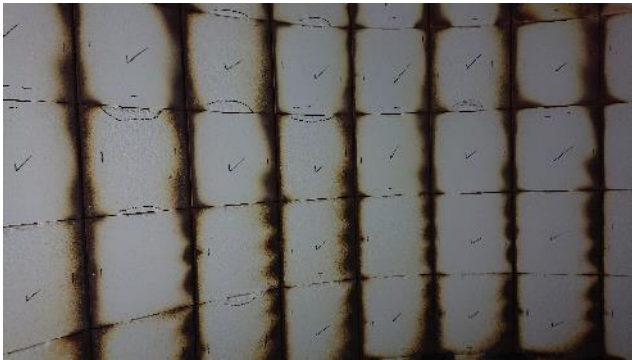
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**Figure 193: CC2 ceramic tiles**



**Figure 194: CC2 ceramic tiles**



**Figure 195: CC2 ceramic tiles**



**Figure 196: CC2 ceramic tiles**



**Figure 197: Burner 2-1**



**Figure 198: Burner 2-1**



**Figure 199: Burner 2-1**



**Figure 200: Burner 2-1**

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Figure 201: Burner 2-1



Figure 205: Burner 2-2



Figure 202: Burner 2-1



Figure 206: Burner 2-2



Figure 203: Burner 2-1

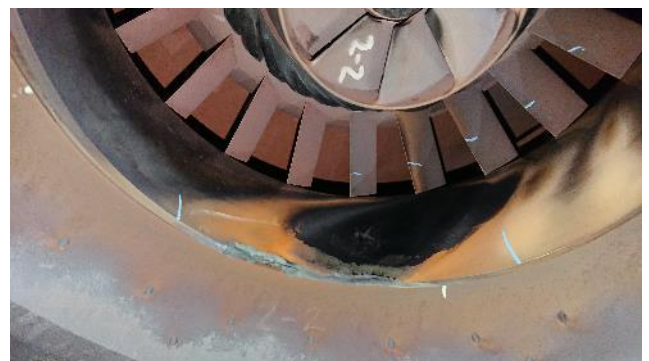


Figure 207: Burner 2-2



Figure 204: Burner 2-2



Figure 208: Burner 2-2

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Figure 209: Burner 2-2



Figure 213: Burner 2-3



Figure 210: Burner 2-3



Figure 214: Burner 2-3



Figure 211: Burner 2-3



Figure 215: Burner 2-3

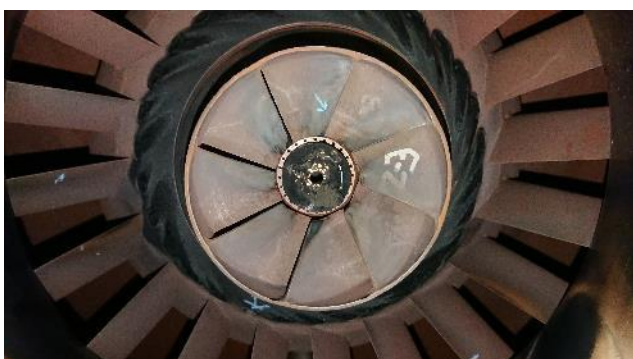


Figure 212: Burner 2-3



Figure 216: Burner 2-3

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**Figure 217: Burner 2-3**



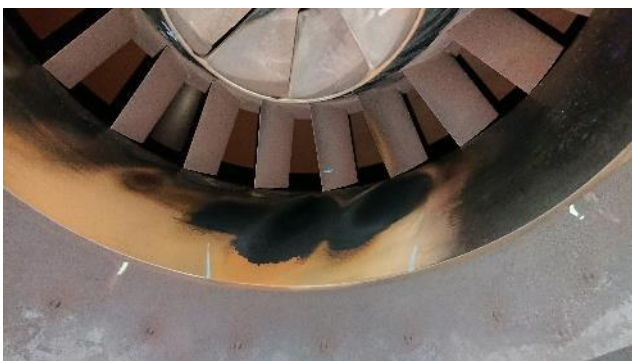
**Figure 221: Burner 2-4**



**Figure 218: Burner 2-3**



**Figure 222: Burner 2-4**



**Figure 219: Burner 2-3**



**Figure 223: Burner 2-4**



**Figure 220: Burner 2-4**



**Figure 224: Burner 2-4**

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**Figure 225: Burner 2-4**



**Figure 229: Burner 2-5**



**Figure 226: Burner 2-4**



**Figure 230: Burner 2-5**



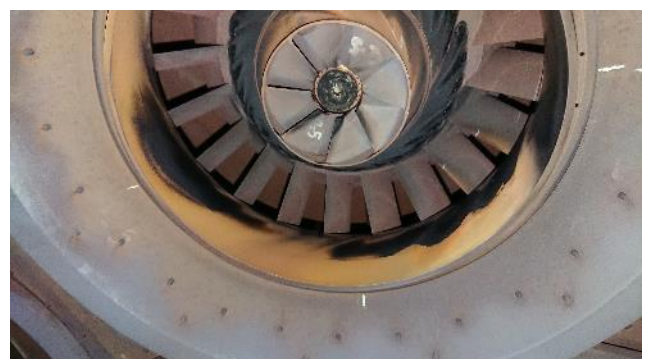
**Figure 227: Burner 2-4**



**Figure 231: Burner 2-5**



**Figure 228: Burner 2-4**



**Figure 232: Burner 2-5**

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Figure 233: Burner 2-6



Figure 237: Burner 2-6



Figure 234: Burner 2-6



Figure 238: Burner 2-6



Figure 235: Burner 2-6



Figure 239: Burner 2-7



Figure 236: Burner 2-6



Figure 240: Burner 2-7

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Figure 241: Burner 2-7



Figure 245: Burner 2-7

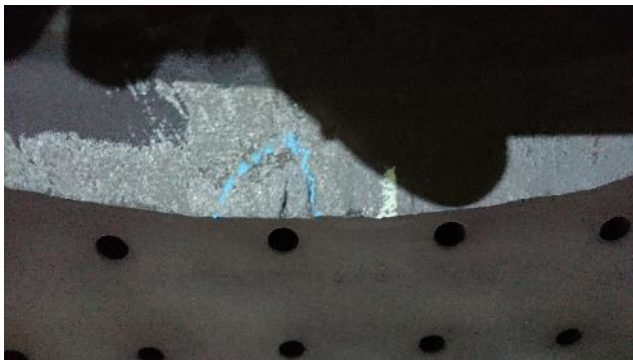


Figure 242: Burner 2-7



Figure 246: Burner 2-8



Figure 243: Burner 2-7



Figure 247: Burner 2-8



Figure 244: Burner 2-7



Figure 248: Burner 2-8

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Figure 249: CC1 FT to MC



Figure 253: CC1 FT to MC



Figure 250: CC1 FT to MC



Figure 254: CC1 MC



Figure 251: CC1 FT to MC



Figure 255: CC1 MC



Figure 252: CC1 FT to MC

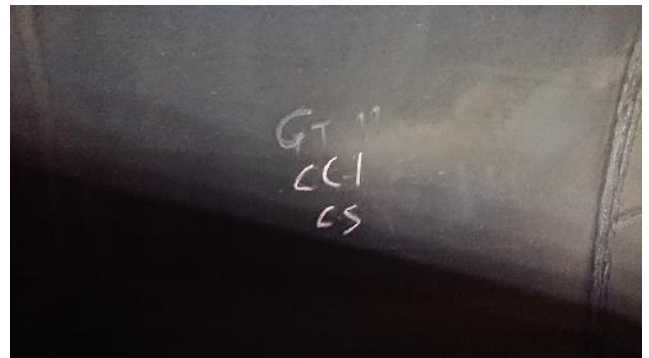


Figure 256: CC1 MC

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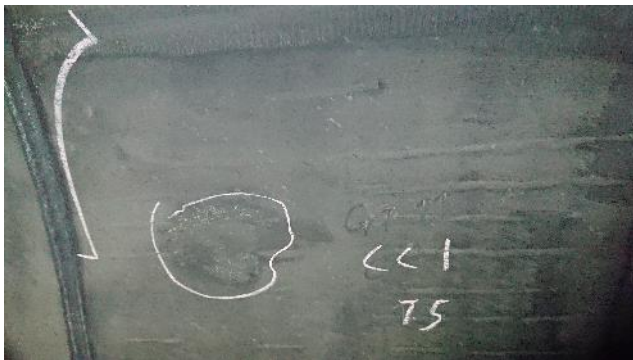


Figure 257: CC1 MC



Figure 261: CC1 MC to IC



Figure 258: CC1 MC



Figure 262: CC1 MC to IC



Figure 259: CC1 MC to IC



Figure 263: CC2 FT to MC



Figure 260: CC1 MC to IC



Figure 264: CC2 FT to MC

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**Figure 265: CC2 FT to MC**



**Figure 269: CC2 FT to MC**



**Figure 266: CC2 FT to MC**



**Figure 270: CC2 FT to MC**



**Figure 267: CC2 FT to MC**



**Figure 271: CC2 FT to MC**



**Figure 268: CC2 FT to MC**



**Figure 272: CC2 MC**

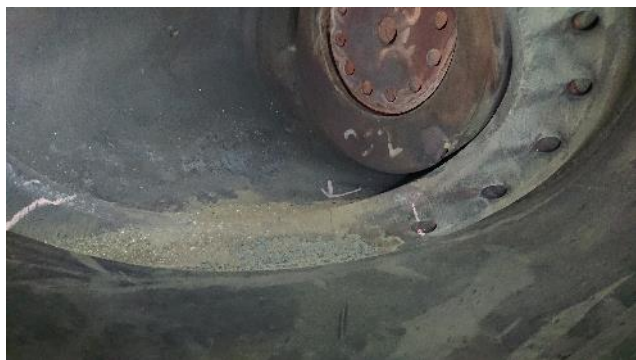
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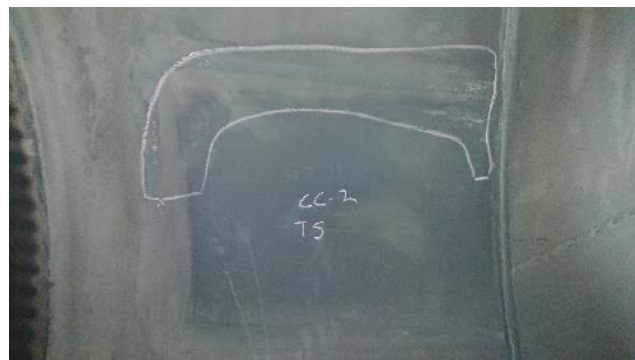
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**Figure 273: CC2 MC**



**Figure 277: CC2 MC**



**Figure 274: CC2 MC**



**Figure 278: CC2 MC**



**Figure 275: CC2 MC**



**Figure 279: CC2 MC to IC**



**Figure 276: CC2 MC**



**Figure 280: CC2 MC to IC**

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**Figure 281: CC2 MC to IC**



**Figure 285: IC hub**



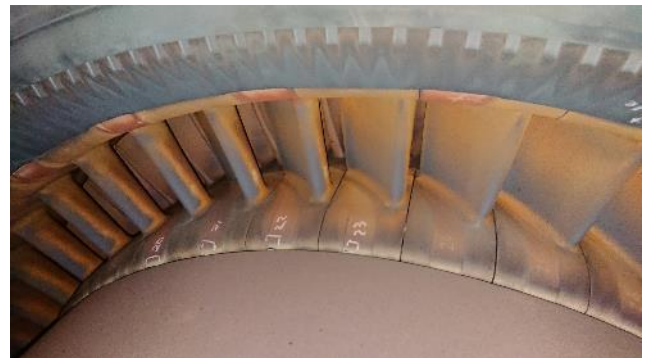
**Figure 282: CC2 MC to IC**



**Figure 286: TLe1**



**Figure 283: CC2 MC to IC**



**Figure 287: TLe1**



**Figure 284: IC**



**Figure 288: TLe1 & TLal**

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Figure 289: TLa1



Figure 293: IC



Figure 290: TLe1



Figure 294: TLe1



Figure 291: TLe1

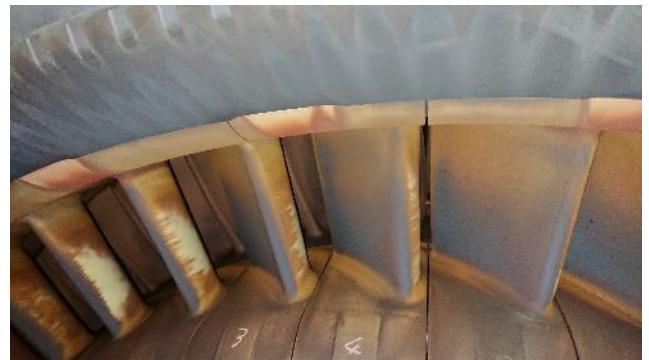


Figure 295: TLe1 & TLa1



Figure 292: TLe1



Figure 296: TLe1 & TLa1

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**Figure 297: TLe1 & TLa1**



**Figure 301: TLe1**



**Figure 298: TLa1**



**Figure 302: TLa4**



**Figure 299: TLa1**



**Figure 303: TLa4**



**Figure 300: TLe1**



**Figure 304: TLa4**

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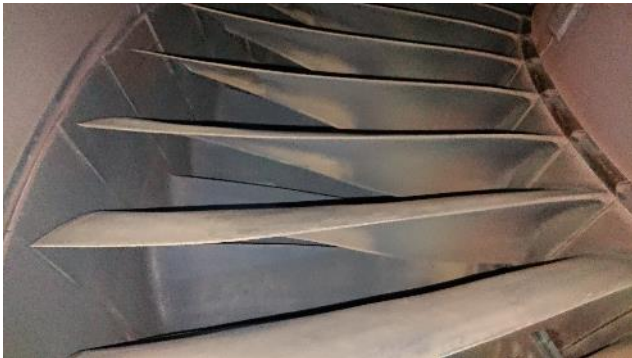




**Figure 305: TLa4 & TLe4**



**Figure 309: TLa4**



**Figure 306: TLa4 & TLe4**



**Figure 310: Exhaust external**



**Figure 307: TLa4 tip**



**Figure 311: Exhaust cushion**



**Figure 308: TLa4 & TLe4**



**Figure 312: Exhaust**

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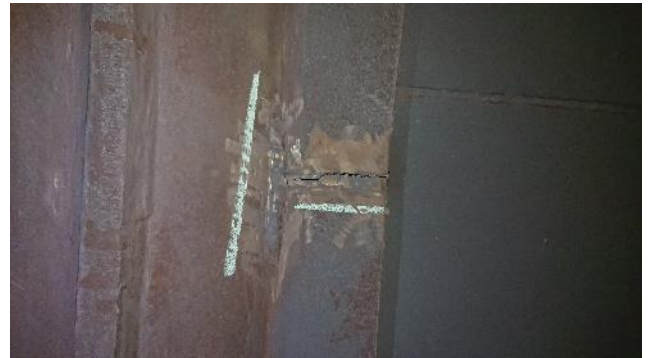
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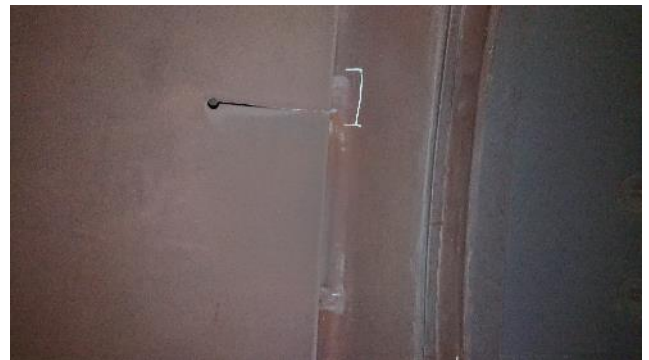
**Figure 313: Exhaust**



**Figure 317: Exhaust – example of crack**



**Figure 314: Exhaust**



**Figure 318: Exhaust – example of rubbing**



**Figure 315: Exhaust – example of crack**



**Figure 319: Exhaust – example of rubbing**



**Figure 316: Exhaust – example of rubbing**



**Figure 320: Exhaust – example of rubbing**





Figure 321: Exhaust – example of rubbing



Figure 325: Exhaust – example of hammering



Figure 322: Exhaust – example of crack



Figure 326: Exhaust – example of hammering



Figure 323: Exhaust – example of hammering



Figure 327: Exhaust – example of crack



Figure 324: Exhaust – example of crack




Figure 328: Exhaust – example of crack

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	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	64 of 113		



**Figure 329: Exhaust – example of crack**



**Figure 330: Exhaust – example of crack**



**Figure 331: Exhaust – example of crack**


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		<b>Date</b>	30/01/2023		
		<b>Page</b>	65 of 113		

## APPENDIX B

	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #: GT11
	Leak Check Visual Inspection	Checksheet Reference #: 9002
	Decommissioning	Page #: 3 of 5
	Siemens SGT5-2000E Gas Turbine	Project #: GOU.M13
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.

**Lube oil and Jacking oil skid including pipework to all bearings**

Dirty below mist separator

Oil seepage at cooler

Oil seepage from 11MBV23BP521

Drip tray below filters


Oil near jacking oil pumps

Drip tray below jacking oil filters

Significant oil in general - may require intervention before MO; site to clean skid so that leaks can be reported & monitored

**Control oil skid including pipework to Control valves**

Skid filthy - site to clean

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Johan Otto		2022/08/31	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:		
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		

## Check Sheet 1: Leak check - VI

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Document Identifier	194/1353	Rev	0
Date	30/01/2023		
Page	66 of 113		

	ESKOM GOURIKWA POWER STATION	Unit #:	GT11
	Leak Check Visual Inspection	Checksheet Reference #:	9002
		Page #:	2 of 5
Decommissioning	Siemens SGT5-2000E 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**

Missing plugs on 11MBN13CT401 & 11MBN17CT401

Some oil on skid

**Ignition Gas skid including pipework to Combustion chambers**

No findings

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/08/31	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/08/31

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


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		<b>Page</b>	67 of 113		



	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	Insulation	<b>Checksheet Reference #:</b>	V94-2-6004
		<b>Page #:</b>	1 of 4
		<b>Project #:</b>	GOU.MB
<b>Inspection</b>	<b>Siemens SGT5-2000E</b> Centreline	<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
Corrosion and some white deposits
Rubber around dome pulling off

Centre Casing
Corrosion
Some loose screws noted

Exhaust Casing
Corrosion and white deposits noted

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
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ERI ENGINEER	Johan Otto		2022/08/31	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/08/31

### Check Sheet 3: Insulation - VI

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**Gourikwa – GT11 Minor**  
**Inspection**

**Document Identifier**

194/1353

**Rev**

0

**Date**

30/01/2023

**Page**

68 of 113



**ESKOM GOURIKWA POWER STATION**

Combustion Chamber Outer Pipework  
Visual Inspections - LHS

Unit #:

GT11

Checksheet Reference #:

V94-2-2016

Page #:

1 of 2

Project #:

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

Relevant Procedures:

240-136723367

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	

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PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
APPROVED BY - ENGINEER	Johan Otto		2022/08/31	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:		DATE:		DATE: 2022/08/31

**Check Sheet 4: CC1 - VI**

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**Gourikwa – GT11 Minor**  
**Inspection**

**Document Identifier**

194/1353

**Rev**

0

**Date**

30/01/2023

**Page**

69 of 113



**ESKOM GOURIKWA POWER STATION**

Combustion Chamber Outer Pipework  
Visual Inspections - RHS

Unit #:

GT11

Checksheet Reference #:

V94-2-2016

Page #:

2 of 2

Project #:

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

Relevant Procedures:

240-136723367

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:
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ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
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**Check Sheet 5: CC2 - VI**

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**Gourikwa – GT11 Minor**  
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194/1353

**Rev**

0

**Date**

30/01/2023

**Page**

70 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

**Leak Check Visual Inspection**

**Checksheet Reference #:**

9002

**Page #:**

1 of 5

**Project #:**

GOU.MI3

**Decommissioning**

**Siemens SGT5-2000E**

**Relevant Procedures:**

240-136723367

**Gas Turbine**

**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**

Seepage from premix bellow on burner 1-2

**RHS Combustion chamber**

Seepage from premix bellow on burner 2-8

General corrosion

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**Check Sheet 6: Leak check - VI**


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		<b>Date</b>	30/01/2023		
		<b>Page</b>	71 of 113		

	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	Insulation	<b>Checksheet Reference #:</b>	V94-2-6004
		<b>Page #:</b>	2 of 4
		<b>Project #:</b>	GOU.MB
<b>Inspection</b>	<b>Siemens SGT5-2000E</b> Centreline	<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

Exhaust Diffusor
Some corrosion and white deposits noted

Blow-off Pipes
Some corrosion and white deposits noted

Fuel Oil Lines
No findings

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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CHECKED BY - QC				TECHNICAL NOTIFICATION:
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ERI ENGINEER	Johan Otto		2022/08/31	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: 2022/08/31

## Check Sheet 7: Insulation - VI

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Document Identifier	194/1353	Rev	0
Date	30/01/2023		
Page	72 of 113		

	ESKOM GOURIKWA POWER STATION	Unit #:	GT11
	Leak Check Visual Inspection	Checksheet Reference #:	9002
Decommissioning	Siemens SGT5-2000E	Page #:	4 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.

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

No findings

Generator (including bearings and oil seals)

Oil at EE bearing

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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/08/31	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/08/31

**Check Sheet 8: Leak check - VI**


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	<b>Business Management System</b> Inspection Report Gourikwa – GT11 Minor Inspection	Document Identifier	194/1353	Rev	0
		Date	30/01/2023		
		Page	73 of 113		



	ESKOM GOURIKWA POWER STATION	Unit #:	GT11
	Insulation	Checksheet Reference #:	V94-2-6004
		Page #:	4 of 4
	Inspection	Siemens SGT5-2000E	Project #:
Centreline		Relevant Procedures:	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

Turbine Bearing Hub Cover Plate
No findings

Generator
No findings

Intermediate shaft
Jacking oil pipe in cone unsupported

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CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
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ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/08/31

## Check Sheet 9: Insulation - VI

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194/1353

**Rev**

0

**Date**

30/01/2023

**Page**

74 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

**Checksheet Reference #:**

V94-2-1901

**Page #:**

1 of 6

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Compressor**

**Relevant Procedures:**

240-136723367

Area	Inspection Type	Findings	Remarks
Dirty Side	Deposits	Yes	Corrosion noted
	Damage	Yes	Coalescing filters out of position
	Filter Completeness	No	
	Detached parts / Loose Filters	Yes	Drain pipe supports are extremely corroded & compromised
	Soiling of Filters	Yes	
	Non-Uniform alignment of Filters	No	
	Unexpected Modifications	No	
	Missing Filters	No	
	Foreign Objects	Yes	
Clean Side	Deposits	Yes	Black particles similar to what was found in the compressor inlet
	Damage	No	
	Detached parts / Loose Filters	No	
	Formation of Gaps (Light Test)	Yes	1 off filter identified to be removed and reinstalled
	Flaking of paint / Corrosion	Yes	Moderate - intervention required
	Locking	No	
	Foreign Objects	Yes	Liquid
Structure	Damage to Door Seals	No	
	Damage to Door Locks	No	
	Damage to seals in the Wall region	No	
	Holes in the Wall	No	
Silencer	Detached Parts / Loose Elements	No	
	Deposits, Corrosion	Yes	
	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
SIGNATURE:		SIGNATURE:		SIGNATURE:
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**Check Sheet 10: Filter house - VI**

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194/1353

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**Date**

30/01/2023

**Page**

75 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

Compressor Inlet Systems  
Visual Inspection

**Checksheet Reference #:**

V94-2-1901

**Page #:**

2 of 6

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Compressor**

**Relevant Procedures:**

240-136723367

Area	Inspection Type	Findings	Remarks
Air Intake Flap	Proper Operation	No	
	Loose Parts	No	
	Forgein Objects	No	
	Corrosion	Yes	
	Damage	No	
Air Intake	Loose Parts	No	
	Forgein Objects	Yes	Black particles noted
	Deposits	Yes	
	Oil	Yes	Moderate
	Proper installation of intake Gaskets	No	
Gasket between Cone and Inlet Structure	Damage	No	
	Oil Saturation	Yes	
Intake Cone Half-Joint Flat Gasket	Damage	No	
Air Intake Structure	Damage to Door Seals	No	
	Damage to Door Locks	No	
	Damage to seals in the Wall region	No	
	Hones in the Wall	No	
	Oil through the Wall	No	
	Flaking of Paint / Corrosion	Yes	Moderate
Intake Cone	Deposits / Oil Traces	No	
	Forgein Objects	No	
	Incomplete Painting	Yes	Bubbling of paint
	Corrosion	No	
Support Struts	Cracks	No	

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NAME:		NAME:	NAME: P.L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:		DATE:	DATE: 2022/08/31	

**Check Sheet 11: Compressor inlet systems - VI**

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194/1353

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**Date**

30/01/2023

**Page**

76 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

Compressor Inlet Systems  
Visual Inspection

**Checksheets Reference #:**

V94-2-1901

**Page #:**

3 of 6

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Compressor**

**Relevant Procedures:**

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	
	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	

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
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NAME:		NAME:		NAME: P.L. Calana
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**Check Sheet 12: Compressor inlet systems - VI**


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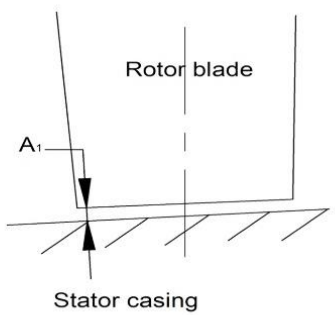
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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT11
	Compressor Stage 1 Radial Blades Tip Clearances (VLA1)	Checksheet Reference #:	V94-2-6102
		Page #:	1 of 2
		Project #:	GOU.MB
<b>Disassembly</b>	<b>Siemens SGT5-2000E</b> Centreline	Relevant Procedures:	240-136723367



Rotor blade

Stator casing

A<sub>1</sub>

Remarks:

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

1.8

Um

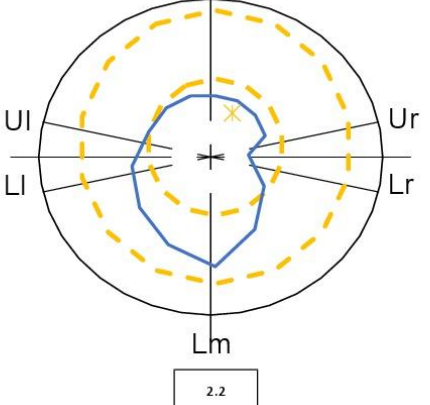
Theoretical Centre	
Top	Right
0.20	0.10

ΔS

0.1

1.9

2.0



1.8



1.7

ΔS

0.1

Specifications	Min	Max
Blade clearance	1.9	2.3
ΔS		0.1

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NAME:		NAME:		NAME: P.L. Calana
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### Check Sheet 13: VLA1 radial blade tip clearances

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78 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

**Diffuser**

**Checksheet Reference #:**

V94-2-1604

**Inspection**

**Page #:**

1 of 1

**Siemens SGT5-2000E**

**Project #:**

GOU.MB

**Compressor**

**Relevant Procedures:**

240-136723367

**Inspection**

**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 14: Compressor diffuser - VI**

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<b>Page</b>	80 of 113		

	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	LHS Flame Tube - Ceramic Tile Inspection	<b>Checksheet Reference #:</b>	V94-2-2006-1
<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:** B8 does not require replacement at this time - missing material does not appear to be a risk to tile integrity

Row	K	J	I	H	G	F	E	D	C	B	A1	A2	A3
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
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21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													

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

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

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**Check Sheet 16: CC1 ceramic tile inspection**


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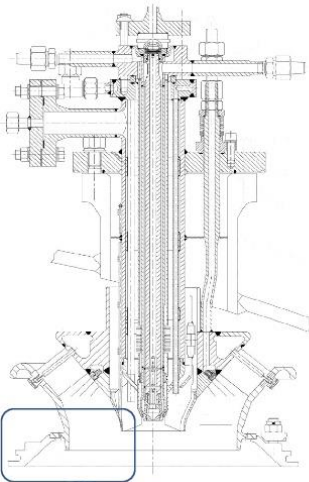
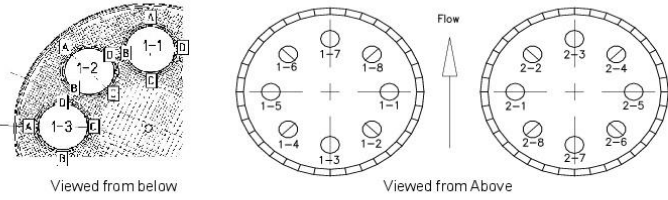
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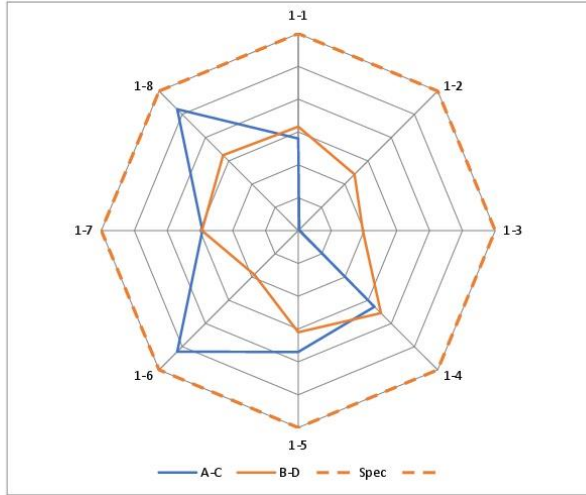


	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	LHS CC Burner Alignment	<b>Checksheet Reference #:</b>	V94-2-2010-1
		<b>Page #:</b>	1 of 2
		<b>Project #:</b>	GOU.MB
<b>Disassembly</b>	<b>Siemens SGT5-2000E Combustion</b>	<b>Relevant Procedures:</b>	240-136723367

Viewed from below      Viewed from Above



  

  

Location	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8
A	5.5	5.4	5.8	6.5	6.1	6.1	5.4	5.7
B	5.3	5.9	6.1	6.1	5.5	4.9	5.0	5.0
C	5.6	6.9	7.2	6.4	5.7	5.0	5.4	4.5
D	5.2	6.2	6.6	5.8	5.5	5.4	5.0	4.8
A-C	0.1	1.5	1.5	0.1	0.4	1.1	0.0	1.1
B-D	0.1	0.3	0.5	0.3	0.0	0.6	0.0	0.1

Spec	Max
Mis-alignment	1.5

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### Check Sheet 17: CC1 burner alignment

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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT11
	Hot Side Dome Plate LHS CC	Checksheet Reference #:	V94-2-2009-1
Disassembly	Siemens SGT5-2000E Combustion	Page #:	1 of 2
		Project #:	GOU.MB
		Relevant Procedures:	240-136723367

**Bottom plate Left**  
 View in opposite flow direction

Rotor Shaft →

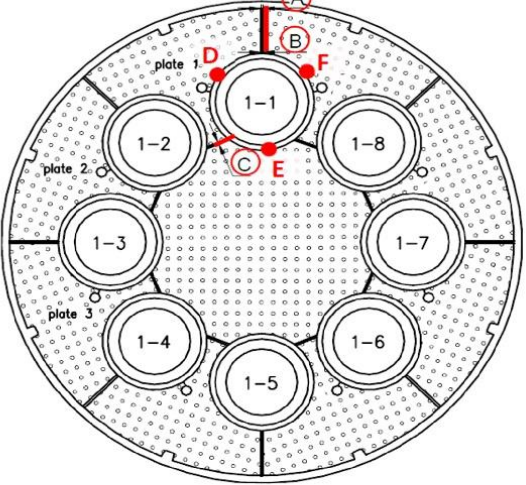




Plate	A	B	C	D	E	F
1	11.9	11.9	12.9	19.3	12.4	17.2
2	10.5	10.3	13.4	19.5	12.0	19.1
3	10.9	10.5	11.8	12.5	12.4	17.9
4	9.7	11.2	10.9	18.7	13.9	13.6
5	13.2	11.9	9.0	13.8	13.1	19.9
6	9.1	9.3	10.6	19.7	13.7	13.4
7	13.6	11.2	11.2	21.1	12.7	20.4
8	10.3	10.3	11.9	17.9	12.1	17.6

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

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


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SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/09/01

**Check Sheet 18: CC1 dome plate clearances**

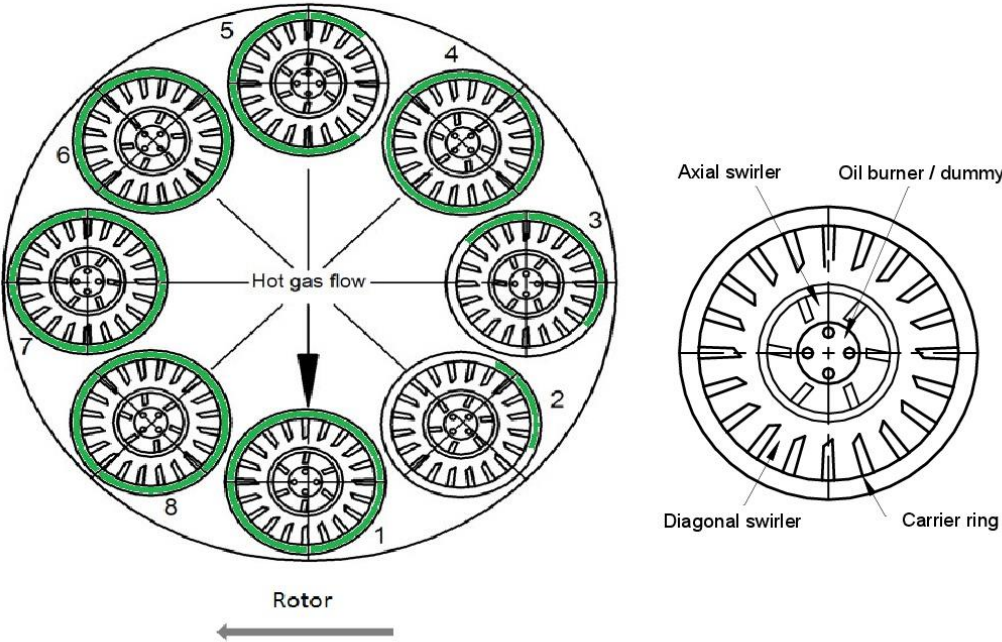
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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	LHS CC Burner Assembly Visual Inspection	<b>Checks Reference #:</b>	V94-2-2012-1
	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 1
	<b>Combustion</b>	<b>Project #:</b>	GOU.MI3
<b>Inspection</b>		<b>Relevant Procedures:</b>	240-136723367





**Remarks:** BIR cracks: 1-1, 1-4, 1-6, 1-7, 1-8

1-6 cracks seem deep -replace at next MO

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	Johan Otto		2022/09/01	NCR OR WORK ORDER NUMBER:
<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: 2022/09/01

**Check Sheet 19: CC1 burner assembly - VI**

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**Inspection Report**  
**Gourikwa – GT11 Minor**  
**Inspection**

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<b>Date</b>	30/01/2023		
<b>Page</b>	84 of 113		

	<b>ESKOM GOURIKWA POWER STATION</b>				Unit #:	GT11
	Diffusion Burners LHS Visual Inspections				Checksheet Reference #:	V94-2-2023-1
<b>Inspection</b>	Siemens SGT5-2000E Combustion				Page #:	1 of 1
					Project #:	GOU.MB
					Relevant Procedures:	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	No	No	No	No	No	No	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	Yes	Yes	Yes	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	Yes	No	No	No	No	No	No	Yes
	Cracks	No	No	No	No	No	No	No	No
	Discoloration	No	No	No	No	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	Johan Otto		2022/09/01	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	P.L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:	2022/09/01	

**Check Sheet 20: CC1 diffusion burners - VI**

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**Gourikwa – GT11 Minor**  
**Inspection**

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30/01/2023

**Page**

85 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

**Checksheet Reference #:**

V94-2-2028

**Page #:**

1 of 3

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

**Relevant Procedures:**

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

**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	Johan Otto		2022/09/01	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: 2022/09/01


**Check Sheet 21: CC1 premix burners - VI**

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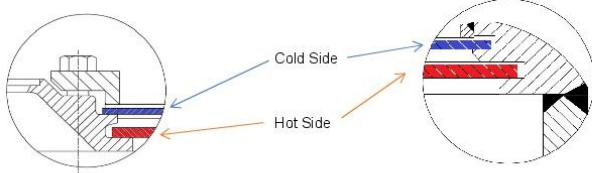
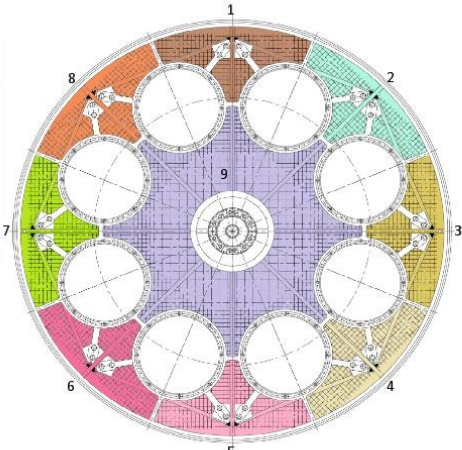
	<b>ESKOM GOURIKWA POWER STATION</b>						Unit #:		GT11		
	Dome Plates Visual Inspection						Checksheet Reference #:		V94-2-2020		
	Siemens SGT5-2000E Combustion						Page #:		1 of 2		
<b>Inspection</b>								Project #:		GOU.MB	
								Relevant Procedures:		240-136723367	



  

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	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Scaling	No	No	No	No	No	No	No	No	No
		Cracks	No	No	No	No	No	No	No	No	No
		Deformation	Yes	No	No	Yes	No	Yes	Yes	No	No
RHS CC	Hammering Marks	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Scaling	No	Yes	No	No	No	Yes	No	No	No	
	Cracks	No	No	No	No	No	No	No	No	No	
	Deformation	Yes	Yes	No	Yes	No	No	No	Yes	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	Johan Otto		2022/09/01	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/09/01

### Check Sheet 22: Hot side dome plates - VI

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<b>Page</b>	87 of 113		

	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT11	
	Flame Tube Inspection - RHS	Checksheet Reference #:	V94-2-2026-2	
		Page #:	1 of 1	
	<b>Inspection</b>	Project #:	GOU.MB	
		<b>Siemens SGT5-2000E</b>	Relevant Procedures:	240-136723367
		<b>Combustion</b>		

Visual Inspections

Area	Inspection	Findings	Remarks	
Sight Glass	Soiling	No		
	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		

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				M & TE NUMBER:
CHECKED BY - SUPERVISOR				TECHNICAL NOTIFICATION:
CHECKED BY - QC				NCR OR WORK ORDER NUMBER:
VERIFIED BY - TECHNICIAN	Johan Otto		2022/09/01	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN	ESKOM ENGINEER	
NAME:		NAME:	P.L. Calana	
SIGNATURE:		SIGNATURE:		
DATE:		DATE:	2022/09/01	


## Check Sheet 23: CC2 FT - VI

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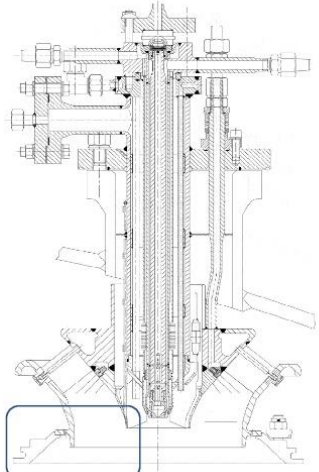
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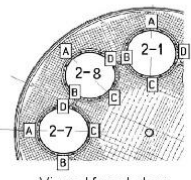
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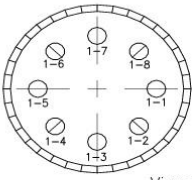
	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	RHS CC Burner Alignment	<b>Checksheet Reference #:</b>	V94-2-2010-2
	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 2
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
<b>Disassembly</b>		<b>Relevant Procedures:</b>	240-136723367

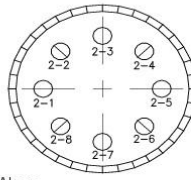




Viewed from below

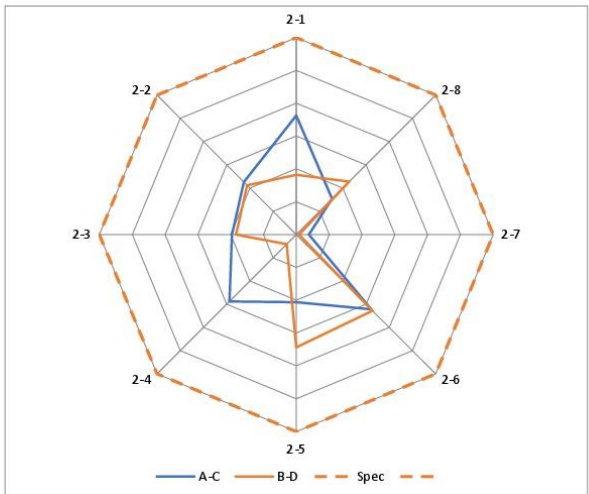


Flow



Viewed from Above





  

Location	2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8
A	5.7	5.5	5.2	5.8	5.6	6.1	5.4	5.4
B	5.5	5.4	4.9	4.8	5.6	5.6	5.1	5.1
C	5.4	5.9	5.7	5.9	6.1	6.0	6.7	6.2
D	6.1	5.8	5.5	6.1	5.4	5.5	6.6	5.4
A-C	0.3	0.4	0.5	0.1	0.5	0.1	1.3	0.7
B-D	0.6	0.4	0.6	1.3	0.2	0.1	1.5	0.4

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				
ERI ENGINEER	Johan Otto		2022/09/01	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: 2022/09/01

### Check Sheet 24: CC2 burner alignment


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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	Hot Side Dome Plate RHS CC	<b>Checksheet Reference #:</b>	V94-2-2009-2
	<b>Siemens SGT5-2000E</b>	<b>Page #:</b>	1 of 2
	<b>Combustion</b>	<b>Project #:</b>	GOU.MB
<b>Disassembly</b>		<b>Relevant Procedures:</b>	240-136723367

**Bottom plate Right**  
**View in opposite flow direction**

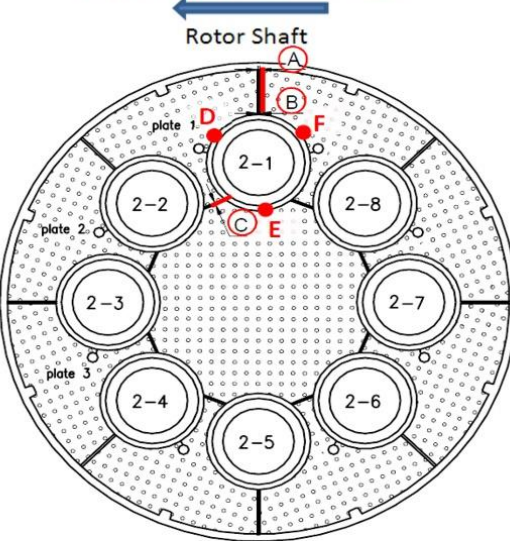

  

Plate	A	B	C	D	E	F
1	10.2	11.5	19.3	19.4	12.2	19.7
2	9.7	9.7	20.4	19.9	11.5	20.3
3	10.6	11.3	14.3	19.6	12.4	19.1
4	10.6	10.2	9.0	18.9	12.8	20.5
5	13.2	12.4	4.6	14.2	13.6	20.3
6	9.2	9.7	4.1	19.6	13.0	13.9
7	11.7	13.1	6.8	15.4	14.7	19.4
8	9.7	9.5	14.4	19.1	12.7	13.0



  

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

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


  

<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					
ERI ENGINEER	Johan Otto		2022/09/01	<b>NCR OR WORK ORDER NUMBER:</b>	
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>	
<b>NAME:</b>		<b>NAME:</b>		<b>NAME:</b>	P.L. Calana
<b>SIGNATURE:</b>		<b>SIGNATURE:</b>		<b>SIGNATURE:</b>	
<b>DATE:</b>		<b>DATE:</b>		<b>DATE:</b>	2022/09/01

**Check Sheet 25: CC2 dome plate alignment**

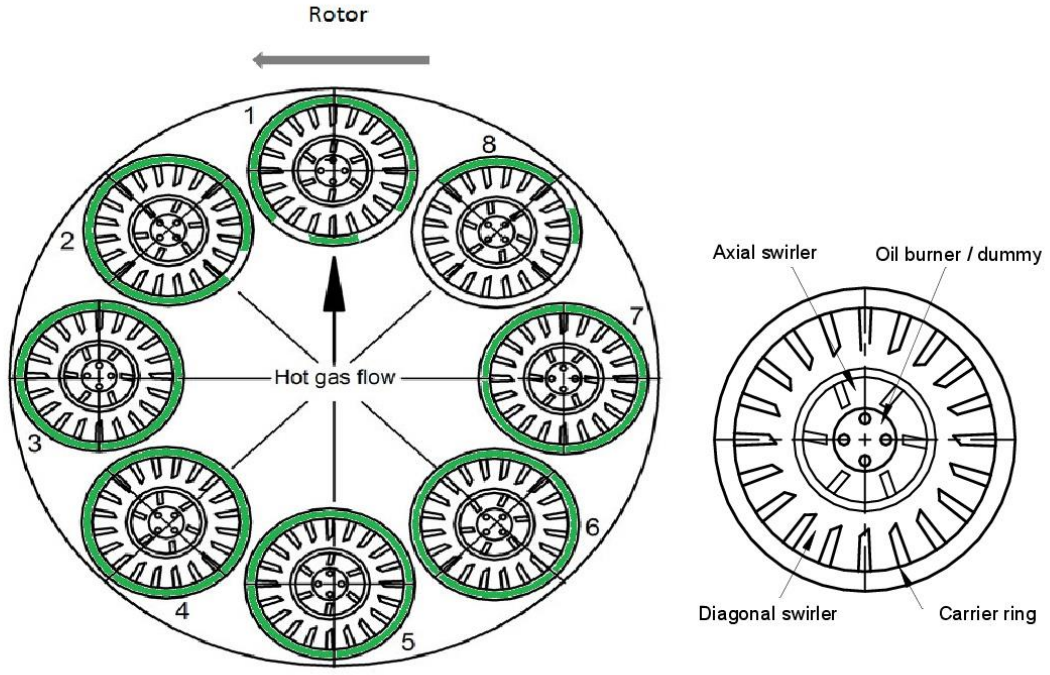
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	<b>ESKOM GOURIKWA POWER STATION</b> RHS CC Burner Assembly Visual Inspection	Unit #: GT11 Checksheet Reference #: V94-2-2012-2 Page #: 1 of 1 Project #: GOU.MB
	<b>Siemens SGT5-2000E</b> Combustion	Relevant Procedures: 240-136723367




**Rotor**





Remarks: BIR cracks: 2-3, 2-4, 2-7

2-4 will require replacement in the next MO

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				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Johan Otto		2022/09/01	
<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: 2022/09/01

**Check Sheet 26: CC2 burner assembly - VI**

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**Date**

30/01/2023

**Page**

91 of 113



**ESKOM GOURIKWA POWER STATION**

Diffusion Burners  
RHS Visual Inspections

Unit #:

GT11

Checksheet Reference #:

V94-2-2023-2

Page #:

1 of 1

Project #:

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

Relevant Procedures:

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

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

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
PERFORMED BY - ARTISAN				
CHECKED BY - SUPERVISOR				M & TE NUMBER:
CHECKED BY - QC				
VERIFIED BY - TECHNICIAN				TECHNICAL NOTIFICATION:
APPROVED BY - ENGINEER	Johan Otto		2022/09/01	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: 2022/09/01

**Check Sheet 27: CC2 diffusion burners - VI**

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30/01/2023

**Page**

92 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

Premix Burner  
RHS Visual Inspections

**Checksheet Reference #:**

V94-2-2028

**Page #:**

2 of 3

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

**Relevant Procedures:**

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

**Remarks:** Blocked nozzles; 2-3:1, 2-4:1

DS OH; 2-1:6, 2-2:7, 2-3:3, 2-4:5, 2-5:2, 2-6:3, 2-7:4, 2-8:3

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	Johan Otto		2022/09/01	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: 2022/09/01

**Check Sheet 28: CC2 premix burners - VI**

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Gourikwa – GT11 Minor  
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194/1353

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0

Date

30/01/2023

Page

93 of 113



ESKOM GOURIKWA POWER STATION

Unit #:

GT11

LHS Mixing Chamber  
Visual Inspection

Checksheet Reference #:

V94-2-2011-1

Page #:

1 of 3

Project #:

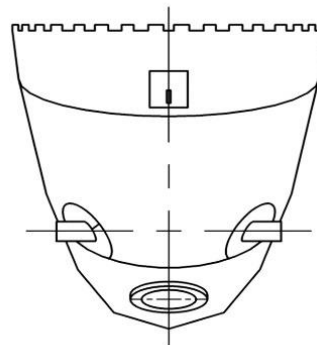
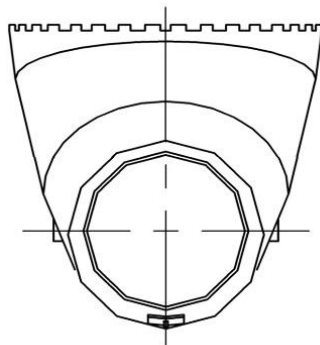
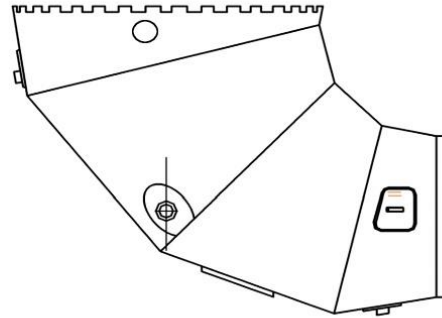
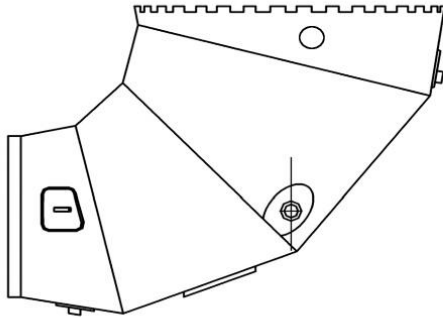
GOU.MI3

Inspection

Siemens SGT5-2000E  
Combustion

Relevant Procedures:

240-136723367



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				
ERI ENGINEER	Johan Otto		2022/09/01	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: 2022/09/01

**Check Sheet 29: CC1 MC - VI**

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194/1353

**Rev**

0

**Date**

30/01/2023

**Page**

94 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

LHS Mixing Chamber  
Visual Inspection

**Checksheet Reference #:**

V94-2-2011-1

**Page #:**

2 of 3

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

**Relevant Procedures:**

240-136723367

Area	Inspection	Findings	Remarks
Complete Surface	Corrosion	Yes	Minor
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	No	
	Deformation	No	
Reinforcement and Guide Plate Regions	Corrosion	Yes	TS
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	Yes	TS
Castellations	Scoring Marks / Wear	Yes	3, 4-5, 7, 8-9, 15-18, 19-20, 21, 27, 28, 29, 30-31, 32-33
	Deformation	No	
Guides	LHS - Wear		
	Bottom - Wear		
	RHS - Wear		
Bushing Supports	LHS - Wear		
	RHS - Wear		
Cooling Air Ring	Wear / Hammering Marks	Yes	15, 16-14
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	Johan Otto		2022/09/01	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:	Log #:	DATE:		DATE: 2022/09/01

**Check Sheet 30: CC1 MC - VI**


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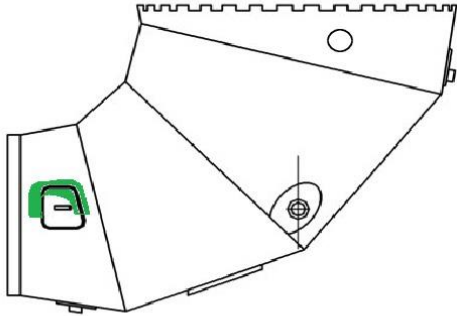
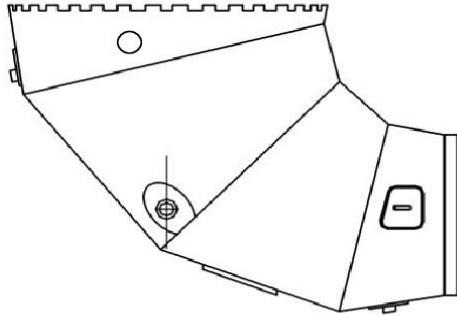
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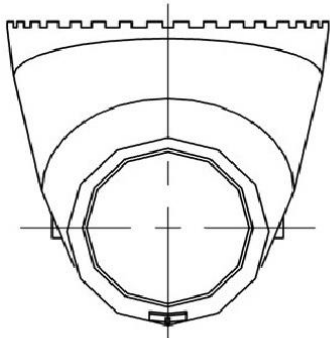
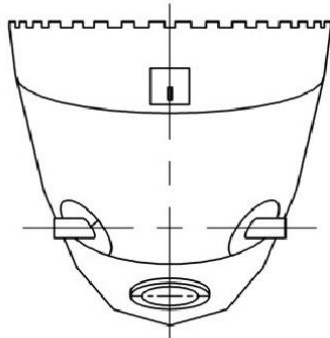


	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT11
	RHS Mixing Chamber Inspection	Checksheet Reference #:	V94-2-2011-2
		Page #:	1 of 3
		Project #:	GOU.MB
<b>Inspection</b>	<b>Siemens SGT5-2000E</b> <b>Combustion</b>	Relevant Procedures:	240-136723367

Remarks: Very good condition

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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				
ERI ENGINEER	Johan Otto		2022/09/01	<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: 2022/09/01

**Check Sheet 31: CC2 MC - VI**

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**Date**

30/01/2023

**Page**

96 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

**RHS Mixing Chamber Inspection**

**Checksheet Reference #:**

V94-2-2011-2

**Page #:**

2 of 3

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Combustion**

**Relevant Procedures:**

240-136723367

Area	Inspection	Findings	Remarks
Complete Surface	Corrosion	Yes	Minimal
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	Yes	CS eccentric key
	Deformation	No	
Reinforcement and Guide Plate Regions	Corrosion	Yes	TS minimal
	Scaling	No	
	Mechanical Material Thinning	No	
	Cracks	No	
Castellations	Scoring Marks / Wear	Yes	7-11, 15, 17-20, 23, 25-27, 28-30, 31, 33
	Deformation	No	
Guides	LHS - Wear		
	Bottom - Wear		
	RHS - Wear		
Bushing Supports	LHS - Wear		
	RHS - Wear		
Cooling Air Ring	Wear / Hammering Marks	Yes	12-13, 25-16, 19-11
Manhole Insert	Mechanical Material thinning	No	
	Scaling	No	
Manhole Collar	Scaling	No	
	Cracks	Yes	

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	Johan Otto		2022/09/01	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:	2022/09/01

**Check Sheet 32: CC2 MC - VI**


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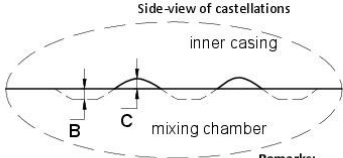
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	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Mixing Chamber to Inner Casing Clearances		Checksheet Reference #:	V94-2-2005
	Siemens SGT5-2000E		Page #:	1 of 2
	Combustion		Project #:	GOU.MI3
<b>Disassembly</b>			Relevant Procedures:	240-136723367

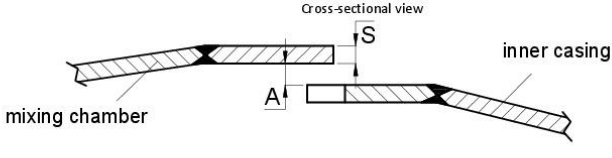
Side-view of castellations



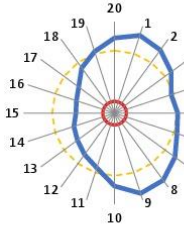
Remarks: \_\_\_\_\_

"A"="A"+"S"

Cross-sectional view



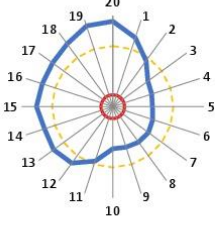
  



View in flow direction

LHS CC				
Location	A	B	C	S
1	22.4	11		
2	21.4	12		
3	19.2	12		
4	16.3	11		
5	17.3	14		
6	18.0	11		
7	20.5	12		
8	22.7	16		
9	23.1	12		
10	20.0	11		
11	15.8	11		
12	14.0	11		
13	12.6	11		
14	11.8	10		
15	10.6	10		
16	11.0	10		
17	12.2	6		
18	15.3	8		
19	17.7	11		
20	20.6	11		
Average	17.1	11.0		



Specification	Min	Max
Average A	3	3.5
B	16	19



View in flow direction

RHS CC				
Location	A	B	C	S
1	19.9	12		
2	15.5	11		
3	11.9	10		
4	11.2	10		
5	10.9	12		
6	11.5	12		
7	12.1	11		
8	12.0	12		
9	11.7	11		
10	11.5	13		
11	15.7	10		
12	19.1	10		
13	20.1	11		
14	19.7	10		
15	20.9	16		
16	20.3	18		
17	20.4	14		
18	21.3	14		
19	23.3	10		
20	23.4	10		
Average	16.6	11.8		

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	Johan Otto		2022/09/01	NCR OR WORK ORDER NUMBER:
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		
DATE:		DATE:		DATE: 2022/09/01


### Check Sheet 33: MC to IC clearances

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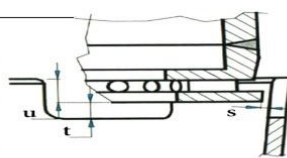
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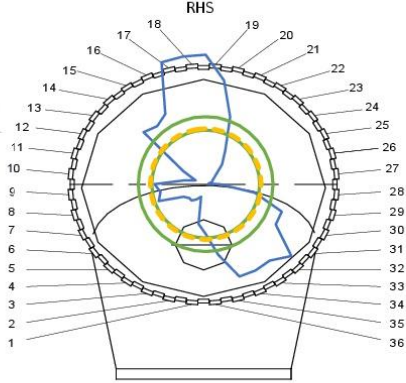
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 <b>Disassembly</b>	<b>ESKOM GOURIKWA POWER STATION</b>				Unit #:	GT11
	Flame Tube Clearances				Checksheet Reference #:	V94-2-2008
	Siemens SGT5-2000E				Page #:	1 of 2
	Combustion				Project #:	GOU.MI3
					Relevant Procedures:	240-136723367

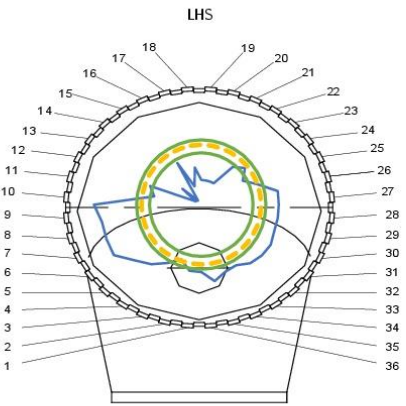
Remarks: \_\_\_\_\_







LHS			
Point	s	t	u
1	5.2	5	
2	5.2	5	
3	4.5	7	
4	5.2	7	
5	6.0	7	
6	6.7	7	
7	7.8	9	
8	7.8	8	
9	7.8	9	
10	8.3	8	
11	3.7	9	
12	4.2	8	
13	0.5	7	
14	1.9	7	
15	0.4	8	
16	3.7	8	
17	1.5	6	
18	2.9	5	
19	1.9	4	
20	1.9	4	
21	1.9	3	
22	1.9	4	
23	3.8	5	
24	4.4	5	
25	3.7	7	
26	4.6	7	
27	6.0	7	
28	6.0	7	
29	6.0	7	
30	6.0	7	
31	6.2	8	
32	6.1	8	
33	5.9	5	
34	5.4	5	
35	5.5	5	
36	6.0	5	
Ave	4.6	6.5	

RHS			
Point	s	t	u
1	3.7	6	
2	3.0	6	
3	1.0	6	
4	1.3	7	
5	1.6	7	
6	1.6	6	
7	1.9	7	
8	3.7	7	
9	3.4	7	
10	3.8	8	
11	1.6	9	
12	0.8	8	
13	1.9	7	
14	6.0	8	
15	5.6	10	
16	6.0	9	
17	9.6	8	
18	9.6	6	
19	9.6	7	
20	7.8	5	
21	5.3	5	
22	2.9	5	
23	1.9	5	
24	0.9	5	
25	0.6	7	
26	0.5	7	
27	0.2	7	
28	1.0	6	
29	3.7	8	
30	6.0	7	
31	6.0	8	
32	8.3	8	
33	7.4	7	
34	7.4	8	
35	7.3	8	
36	5.3	7	
Ave	4.1	7.0	



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

<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		2022/09/01		
<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:	2022/09/01

### Check Sheet 34: FT to MC clearances

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**Inspection**

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<b>Date</b>	30/01/2023		
<b>Page</b>	99 of 113		

	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Inner Casing Visual Inspection		Checksheet Reference #:	V94-2-2805
<b>Inspection</b>	Siemens SGT5-2000E Combustion		Page #:	1 of 3
			Project #:	GOU.MB
		Relevant Procedures:	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-fir 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	Refer to MC check sheets
	Cracks	No	
Clamping Bolt for Protective Liner and Flow Baffle	Wear		
	Thermal Stress Cracks On Transision 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>
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		2022/09/01	<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: 2022/09/01	

**Check Sheet 35: IC - VI**

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<b>Document Identifier</b>	194/1353	<b>Rev</b>	0
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<b>Page</b>	100 of 113		

	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	Stage 1 Vanes Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-3005-1
		<b>Page #:</b>	2 of 6
		<b>Project #:</b>	GOU.M13
<b>Inspection</b>	<b>Siemens SGT5-2000E Turbine</b>	<b>Relevant Procedures:</b>	240-136723367

			<table><tr><th>Damage Type</th><th>Counts</th></tr><tr><td>Wear or Cracks on Groove for Anti-rotation Pin</td><td></td></tr><tr><td>Wear or Cracks on Fitting Surface</td><td></td></tr><tr><td>Wear or Cracks on Groove for Seals</td><td></td></tr><tr><td>Overheating</td><td></td></tr><tr><td>Rubbing Marks</td><td></td></tr><tr><td>Cracks</td><td></td></tr><tr><td>Deformation</td><td></td></tr><tr><td>Coating Abrasion / Thinning</td><td></td></tr><tr><td>Mechanical Material Thinning</td><td></td></tr></table>	Damage Type	Counts	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	
Damage Type	Counts																						
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																							
<b>Remarks:</b>	TBC scuffing on hub 20, 21, 222, 23 slightly 3, 4																						
	Standard deposits																						

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

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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ERI ENGINEER	Johan Otto		2022/09/01	<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: 2022/09/01

**Check Sheet 36: TLe1 - VI**


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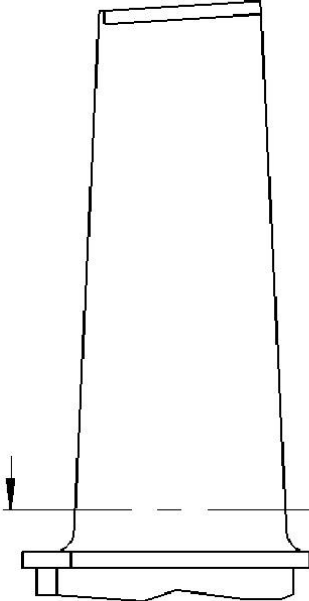
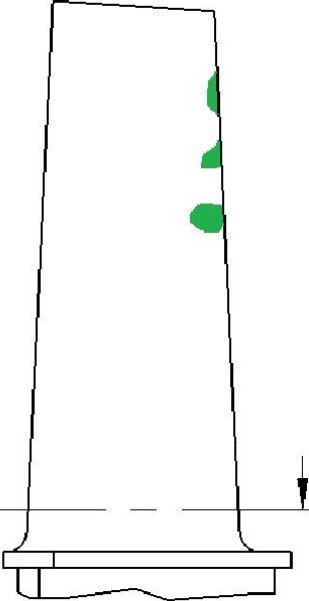
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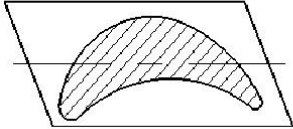
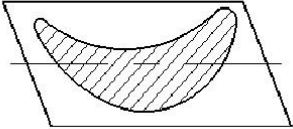
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	<b>ESKOM GOURIKWA POWER STATION</b>	<b>Unit #:</b>	GT11
	Stage 1 Blades Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-3802-1
<b>Inspection</b>	Siemens SGT5-2000E Turbine	<b>Page #:</b>	2 of 7
		<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

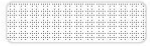





  

Damage Type		Counts
Blade Tip	Cracks	
	Rubbing	
	Oxidation	
	Deformation	
	Break-out	
Airfoil and Platform	Deposits	
	Cracks	
	Coating Thinning	
	Overheating	
	FOD	
	Break-out	
Root	Corrosion / Erosion	
	Wear	
	Damage	

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

**Remarks:** General flaking of TBC on LE tip

**Standard deposits**



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VERIFIED BY - TECHNICIAN				
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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: 
DATE:		DATE:		DATE: 2022/09/01

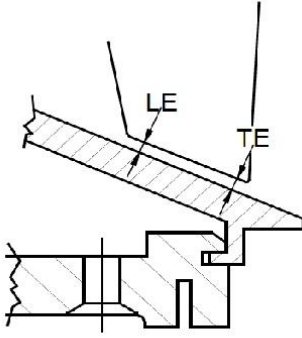
**Check Sheet 37: TL1 - VI**

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 <b>Disassembly</b>	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Turbine Radial Blade Tip Clearances		Checksheet Reference #:	V94-2-6301
	Siemens SGT5-2000E Centreline		Page #:	1 of 2
			Project #:	GOU.MI3
		Relevant Procedures:	240-136723367	





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

Stage 1				Stage 4			
3.8	3.5			6.6	6.6		
4.6		4.6	0.1	7.2		6.7	0.0
4.4		4.6	0.0	7.2		6.7	0.0
Δs		4.7	0.3	7.5		6.7	
0.0	4.6	4.6	0.1	7.3		6.7	
0.0	4.4						
		4.5	4.2			6.0	6.4
		Theo- Centre	Top Right			Theo- Centre	Top Right
		LE	0.35 -0.03			LE	-0.3 0.33
		TE	0.35 -0.1			TE	-0.1 0.28

**Remarks:** Stage 1 - no signs of rubbing noted - values similar to previous outage

unit hot when stage 4 was measured - no signs of rubbing noted

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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ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:		DATE:		DATE: 2022/09/01

### Check Sheet 38: TLa1 & TLa4 radial blade tip clearances

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**Business Management System**  
**Inspection Report**  
**Gourikwa – GT11 Minor**  
**Inspection**

**Document Identifier**

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**Rev**

0

**Date**

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**Page**

103 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

Exhaust Casing  
Inspections

**Checksheet Reference #:**

V94-2-5002

**Page #:**

1 of 1

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Exhaust**

**Relevant Procedures:**

240-136723367

Area	Sub-Area	Inspection	Findings	Remarks
Casing Lining	Inside Wall Surface	Deposits	No	Very clean
		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	Deformation		
		Scuffing Marks	Yes	
		Lack of Overlap	No	
		Cracks	Yes	
		Deformation / Dents	No	
		Weld Bead - Cracks	Yes	
Exhaust Casing	Expansion Joint	Cracks		Boroscopic Inspection
	Horizontal Joint Faces	Scoring Marks		
		Marks indicating that Hot Air has Escaped		
		Gapping (Horizontal / Vertical)		
	Partition Plate to TVC	Mechanical Material Thinning		
	Vertical Flange	Scoring Marks		
Hub Cover Plate	Sheet Metal Jacketing	Galling Marks		
	Weld Beads	Scuffing Marks / Wear	Yes	
		Cracks	Yes	

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ERI ENGINEER	Johan Otto		2022/08/31	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: 2022/09/01


**Check Sheet 39: Exhaust casing - VI**

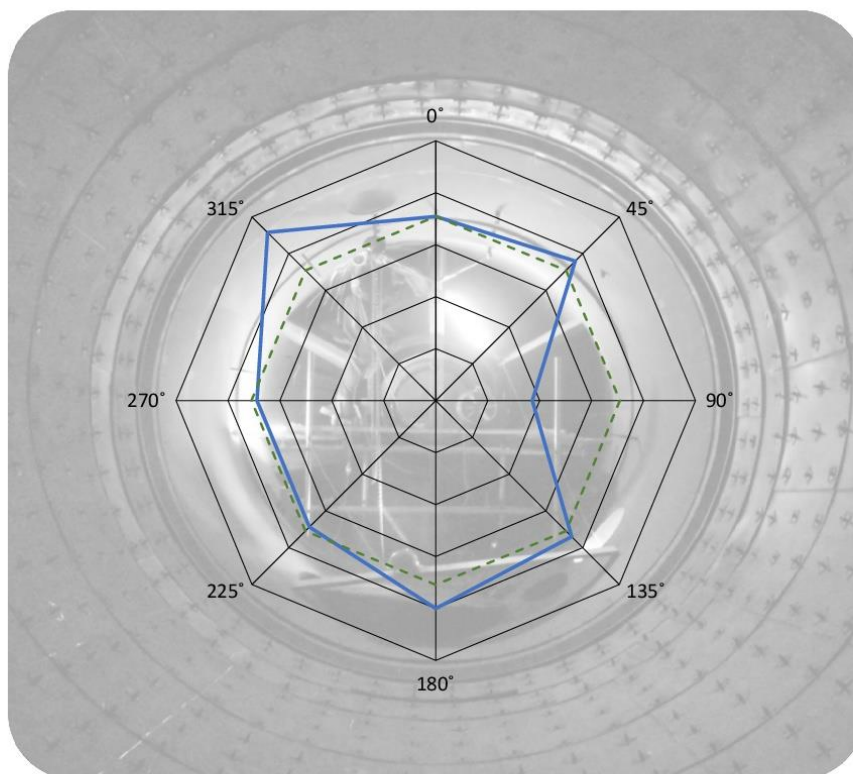
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	<b>ESKOM GOURIKWA POWER STATION</b>	Unit #:	GT11
	Casing to Cover Plate Measurements	Checksheet Reference #:	V94-2-5003
		Page #:	1 of 1
		Project #:	GOU.MB
<b>Inspection</b>	<b>Siemens SGT5-2000E Exhaust</b>	Relevant Procedures:	240-136723367



Gap between Exhaust Casing and Cover Plate for Expansion Joint								
0°	45°	90°	135°	180°	225°	270°	315°	Average
17.7	19	9.3	18.5	20	17.2	17.2	22.9	17.7

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CHECKED BY - QC				<b>TECHNICAL NOTIFICATION:</b>	
VERIFIED BY - TECHNICIAN					
ERI ENGINEER	Johan Otto		2022/08/31	<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:	2022/09/01

### Check Sheet 40: Exhaust casing to cover plate clearances

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**Inspection Report**  
**Gourikwa – GT11 Minor**  
**Inspection**

**Document Identifier**

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**Page**

105 of 113



**ESKOM GOURIKWA POWER STATION**

**Unit #:**

GT11

Downstream of Exhaust Casing  
Inspections

**Checksheet Reference #:**

V94-2-5004

**Page #:**

1 of 1

**Project #:**

GOU.MB

**Inspection**

**Siemens SGT5-2000E**  
**Exhaust**

**Relevant Procedures:**

240-136723367

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

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CHECKED BY - QC				TECHNICAL NOTIFICATION:
VERIFIED BY - TECHNICIAN				
ERI ENGINEER	Johan Otto		2022/08/31	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:	2022/09/01


**Check Sheet 41: Downstream of exhaust - VI**

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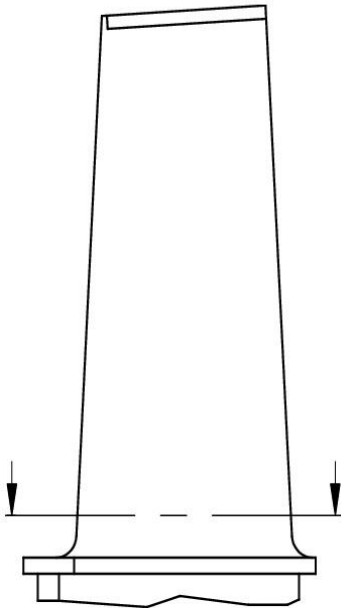
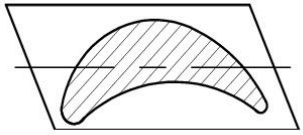
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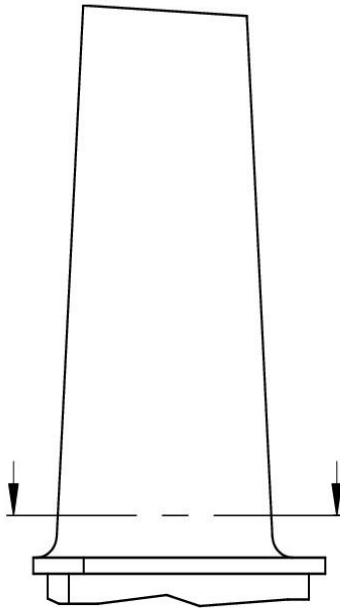
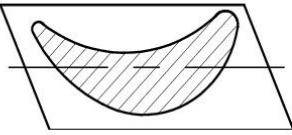
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	Stage 4 Blades Visual Inspection	<b>Checksheet Reference #:</b>	V94-2-3802-4
<b>Inspection</b>	Siemens SGT5-2000E Turbine	<b>Page #:</b>	2 of 6
		<b>Project #:</b>	GOU.MI3
		<b>Relevant Procedures:</b>	240-136723367

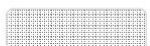





  



Damage Type		Counts
Blade Tip	Cracks	
	Rubbing	
	Oxidation	
	Deformation	
	Break-out	
Airfoil and Platform	Deposits	
	Cracks	
	Coating Thinning	
	Overheating	
	FOD	
	Break-out	
	Corrosion / Erosion	
Root	Wear	
	Damage	

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

**Remarks:** Standard deposits

RESPONSIBLE PERSON	NAME (BLOCK LETTERS)	SIGNATURE	DATE	SERIAL NUMBERS:
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ERI ENGINEER	Johan Otto		2022/08/31	<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: 
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**Check Sheet 42: TL4 - VI**


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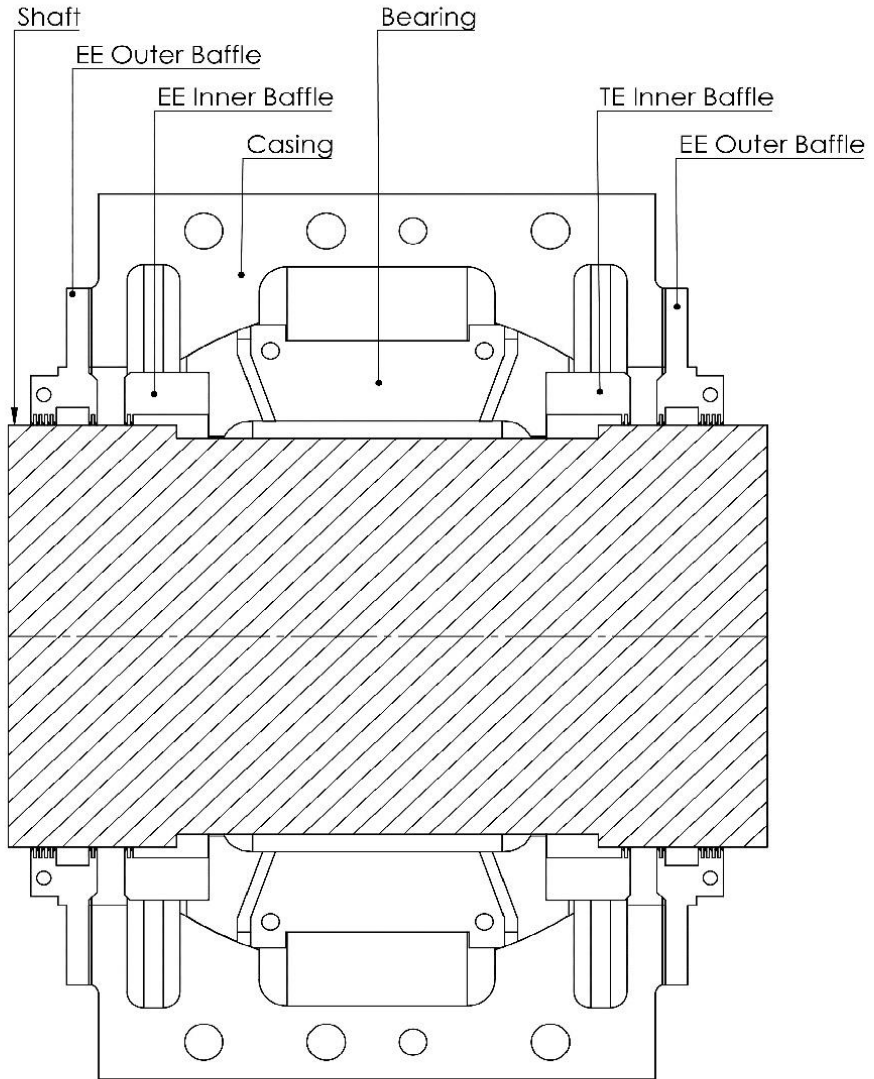
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	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Generator Bearing Overview		Checksheet Reference #:	V94-2-4A00
	Siemens SGT5-2000E		Page #:	1 of 1
	Centerline		Project #:	GOU.MI3
<b>Information</b>			Relevant Procedures:	##


  


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ERI ENGINEER				<b>NCR OR WORK ORDER NUMBER:</b>
<b>ESKOM QUALITY CONTROL</b>		<b>ESKOM TECHNICIAN</b>		<b>ESKOM ENGINEER</b>
NAME:		NAME:		NAME:
SIGNATURE:		SIGNATURE:		SIGNATURE:
DATE:	Log #:	DATE:		DATE:

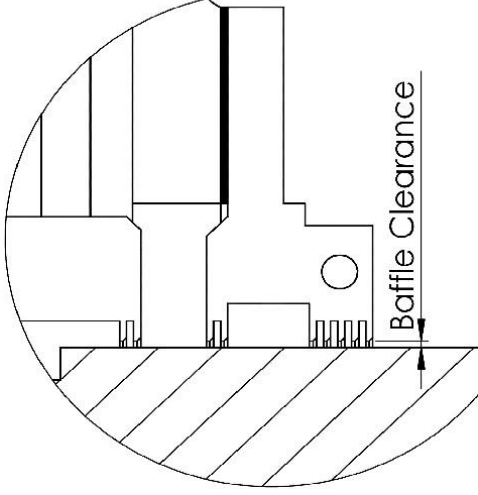
**Check Sheet 43: Generator bearing overview**

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	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Generator EE Bearing Outer Oil Baffle radial clearances		Checksheet Reference #:	V94-2-4A02
	Siemens SGT5-2000E		Page #:	1 of 2
	Centerline		Project #:	GOU.MI3
Disassembly			Relevant Procedures:	##



Remarks:

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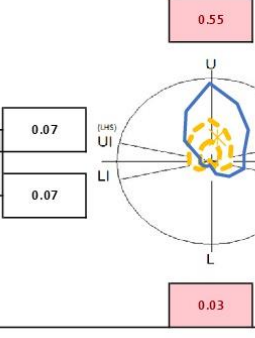
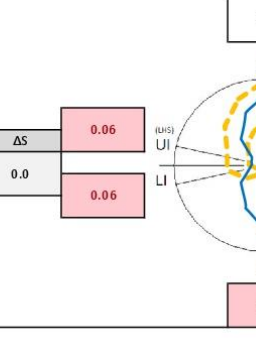
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

Note: Values determined at minimum clearance for each measuring point using a feeler gauge  
 Note: LHS and RHS are based on standing on the Generator EE and facing towards the Turbine

TE				EE			
							
ΔS	0.07	(LHS) UI	0.25	ΔS	0.06	(LHS) UI	0.20
0.00	0.07	LI	0.25	0.00	0.0	LI	0.20
		Theoretical Centre Top: 0.28    Right: 0.09				Theoretical Centre Top: 0.13    Right: 0.07	
		0.03				0.25	

Specifications	LHS / RHS		Top		Bottom	
	Min	Max	Min	Max	Min	Max
Blade clearance	0.07	0.15	0.14	0.29	0.00	0.00

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VERIFIED BY - TECHNICIAN				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Johan Otto		2022/09/27	
<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: 2022/09/27

### Check Sheet 44: Generator EE outer oil baffle clearances


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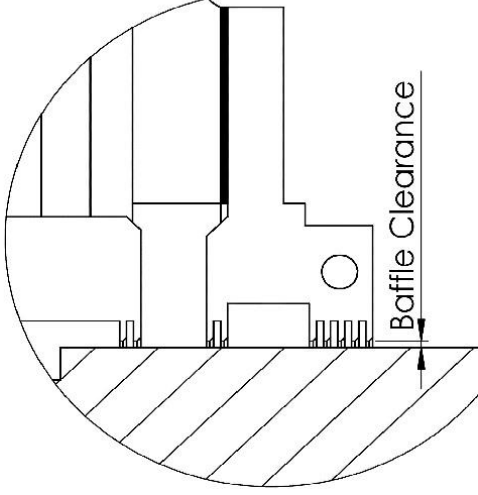
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	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Generator EE Bearing Outer Oil Baffle radial clearances		Checksheet Reference #:	V94-2-4A02
	Siemens SGT5-2000E		Page #:	2 of 2
	Centerline		Project #:	GOU.MI3
Reassembly			Relevant Procedures:	##



Remarks: Reassembled as-is

Clearances above specification - site to plan replacement of baffles

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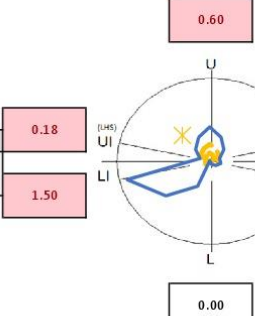
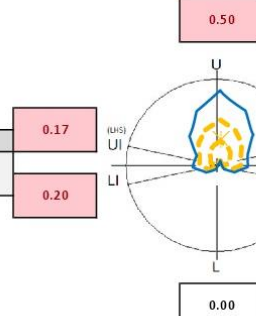
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Note: Values determined at minimum clearance for each measuring point using a feeler gauge  
Note: LHS and RHS are based on standing on the Generator EE and facing towards the Turbine

TE				EE			
							
Theoretical Centre				Theoretical Centre			
Top	Right	Top	Right	Top	Right	Top	Right
0.00	0.30	-0.33		0.00	0.25	0.01	

Specifications	LHS / RHS		Top		Bottom	
	Min	Max	Min	Max	Min	Max
Baffle <del>Clearance</del>	0.07	0.15	0.14	0.29	0.00	0.00

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		2022/09/28	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/09/28


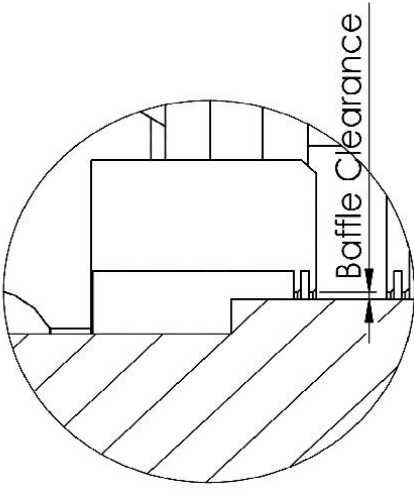
**Check Sheet 45: Generator EE outer oil baffle clearances**

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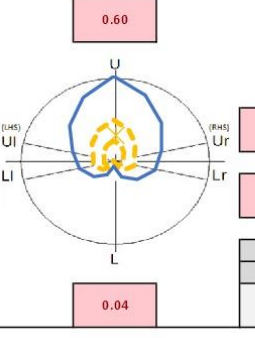
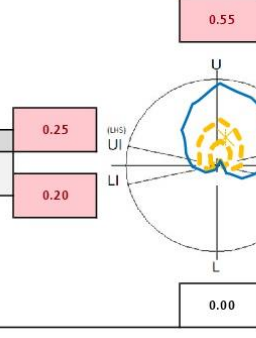
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

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 <b>Reassembly</b>	<b>ESKOM GOURIKWA POWER STATION</b> Generator EE Bearing Inner Oil Baffle radial clearances		Unit #: GT11 Checksheet Reference #: V94-2-4A04 Page #: 2 of 2 Project #: GOU.MI3
	Siemens SGT5-2000E Centerline		Relevant Procedures: ##
			
	Remarks: Reassembled as-is. Clearances above specification - site to plan replacement of baffles		

Note: Values determined at minimum clearance for each measuring point using a feeler gauge  
 Note: LHS and RHS are based on standing on the Generator EE and facing towards the Turbine

TE				EE			
							
ΔS	0.30	(LHS) UI	(RHS) Ur	ΔS	0.25	(LHS) UI	(RHS) Ur
0.05	0.25	LI	Lr	0.05	0.1	LI	Lr
Theoretical Centre Top: 0.30 Right: 0.03				Theoretical Centre Top: 0.28 Right: 0.06			

Specifications	LHS / RHS		Top		Bottom	
	Min	Max	Min	Max	Min	Max
Baffle Blade clearance	0.07	0.15	0.14	0.29	0.00	0.00

<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		2022/09/27	
<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: 2022/09/27

**Check Sheet 46: Generator EE inner oil baffle clearances**


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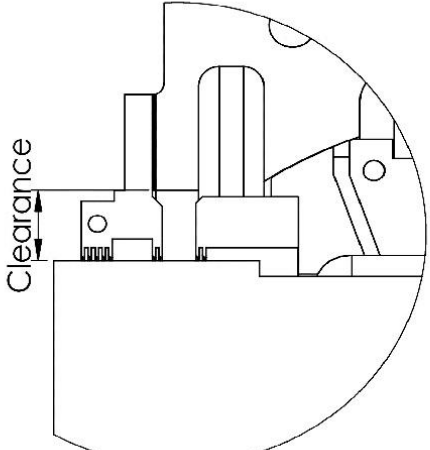
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	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Generator EE Bearing Casing to Shaft Clearance		Checksheet Reference #:	V94-2-4A06
	Siemens SGT5-2000E		Page #:	2 of 2
	Centerline		Project #:	GOU.MI3
Reassembly			Relevant Procedures:	##



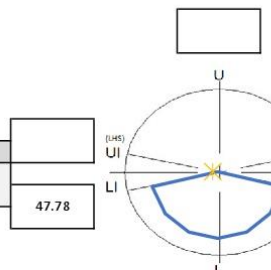
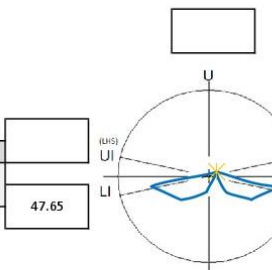
Clearance

Remarks:



Top clearances could not be measured - casing was already removed

Bottom clearance on EE could not be measured - lifting block was in the w

Note: Values determined at minimum clearance for each measuring point using a feeler gauge  
Note: LHS and RHS are based on standing on the Generator EE and facing towards the Turbine

TE				EE			
							
ΔS	47.78	47.66		ΔS	47.65	47.65	
Theoretical Centre Top: 0.00, Right: -0.06				Theoretical Centre Top: 0.00, Right: 0.00			

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				NCR OR WORK ORDER NUMBER:
ERI ENGINEER	Johan Otto		2022/09/27	
ESKOM QUALITY CONTROL		ESKOM TECHNICIAN		ESKOM ENGINEER
NAME:		NAME:		NAME: P.L. Calana
SIGNATURE:		SIGNATURE:		SIGNATURE: 
DATE:	Log #:	DATE:		DATE: 2022/09/27


### Check Sheet 47: Generator EE shaft to casing clearances

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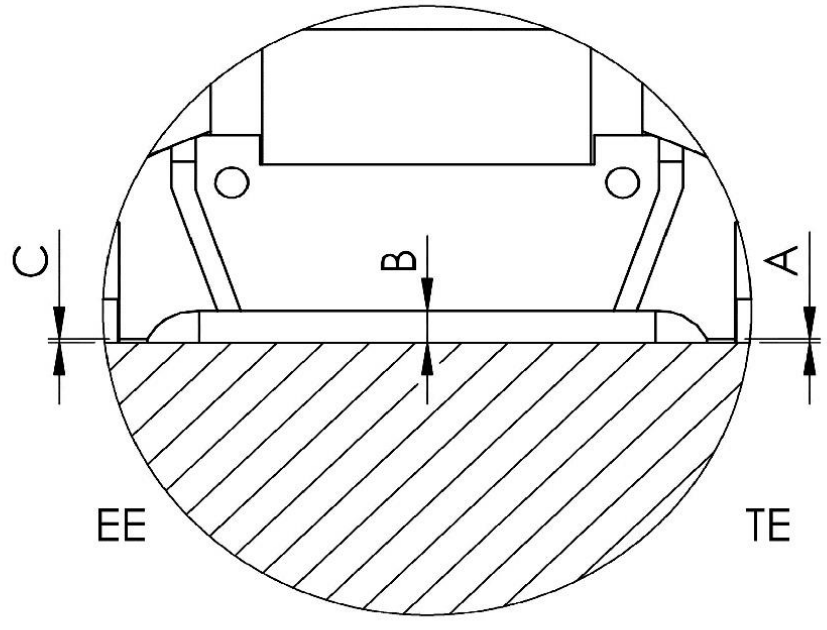
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 <b>Disassembly</b>	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Generator EE Bearing White Metal to Shaft Clearance		Checksheet Reference #:	V94-2-4A10
	Siemens SGT5-2000E		Page #:	1 of 2
	Centerline		Project #:	GOU.MI3
			Relevant Procedures:	##



Clearance	A	B	C
LHS	0.6	-	0.6
Top	-	-	-
RHS	0.6	-	0.6

Specifications	Min	Max
B LHS	0.68	0.71
B Top	0.56	0.62
B RHS	0.68	0.71



  

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

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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	Johan Otto		2022/09/25	
<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: 2022/09/27

**Check Sheet 48: Generator EE Bearing to shaft clearances**


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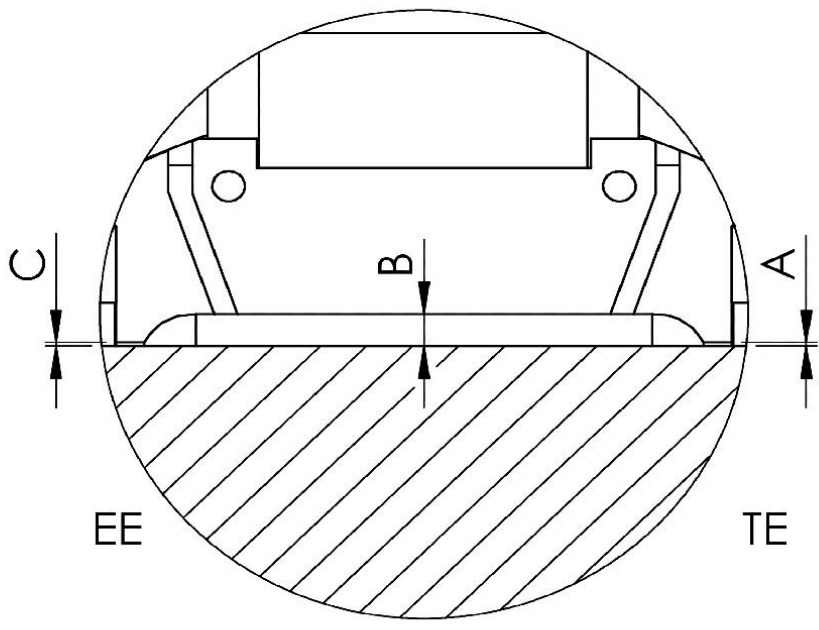
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 <b>Reassembly</b>	<b>ESKOM GOURIKWA POWER STATION</b>		Unit #:	GT11
	Generator EE Bearing White Metal to Shaft Clearance		Checksheet Reference #:	V94-2-4A10
	Siemens SGT5-2000E		Page #:	2 of 2
	Centerline		Project #:	GOU.MI3
			Relevant Procedures:	##



Clearance	A	B	C
LHS	0.6	-	0.6
Top	-	-	-
RHS	0.6	-	0.6

Specifications	Min	Max
B LHS	0.68	0.71
B Top	0.56	0.62
B RHS	0.68	0.71



  

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

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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	Johan Otto		2022/09/27	NCR OR WORK ORDER NUMBER:
<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: 2022/09/27

**Check Sheet 49: Generator EE bearing to shaft clearances**

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