

# ZURNPOWER LLC

## GENERAL & GT13E2 - V96 & MXL



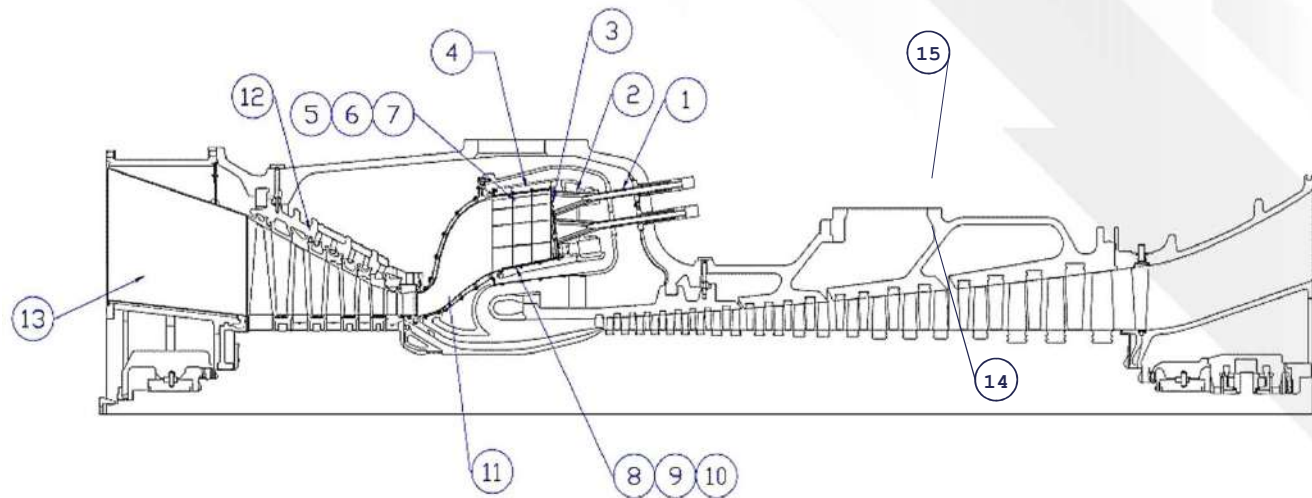
## ZURNPOWER LLC

- Hong Kong based Engineering & Production Company
- Production facility with a workshop area of 2.000 m2
- The company is ISO certified
- Company's main expertise:
  - Proven and detailed knowledge about ex-ABB/Alstom fleet
  - In-House Production of new/repaired components
  - Lifetime evaluation / optimisation of parts based on Customer specific
  - Field Service Support for Scheduled and Unscheduled outages



## GT13E2 PRODUCT PORTFOLIO

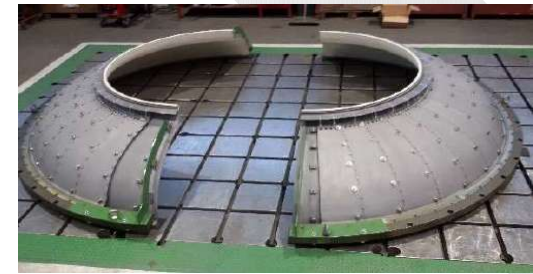
#	COMPONENT DESCRIPTION	NEW	REPAIR
1	EV LANCES	YES	YES
2	EV BURNER	YES	YES
3	FRONT SEGMENTS	YES	YES
4	ZONE 1 – INNER AND OUTER CARRIER	YES	YES
5-7	OUTER SEALING SEGMENT ROW A, B AND C	YES	YES
8-10	INNER SEALING SEGMENT ROW A, B, C	YES	YES
11	ZONE 2 – INNER AND OUTER SHELL	YES	YES
12	TURBINE VANE CARRIER	YES	YES
12	ROTOR AND STATOR HEAT SHIELDS	YES	YES
12	V96 AND MXL BLADES AND VANES	YES	YES
13	EXHAUST GAS CASING	YES	YES
13	EXHAUST DIFFUSER	YES	YES
14	COMPRESSOR BLADES AND VANES	YES	YES
15	COMPRESSOR VANE CARRIER	YES	YES
-	INTERMEDIATE RINGS FOR TVC	YES	YES
-	INSTALLATION HARDWARE, CONSUMABLES	YES	

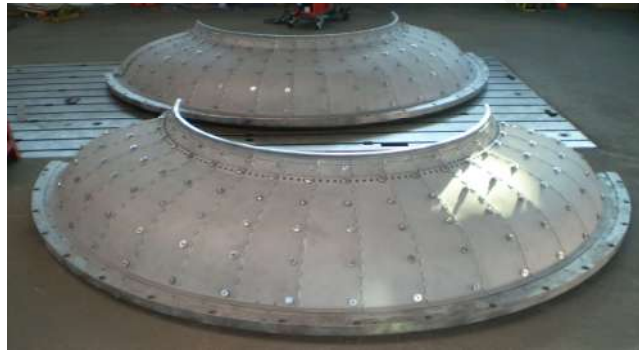
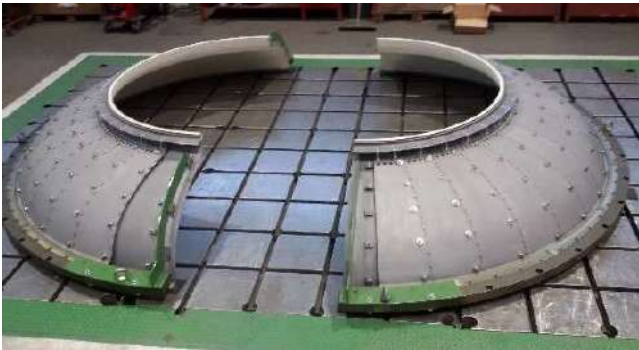


# GT13E2 PRODUCT PORTFOLIO

## PARTS FOR 13E2

- REPAIR OF CAPITAL PARTS – DEPENDING ON REMAINING LIFE BASED ON ASSESSMENT
- MANUFACTURE COMPLETE NEW PARTS





GT13E2 ZONE 2 OUTER SHELL LEFT AND RIGHT



GT13E2 ZONE 2 INNER SHELL FLAPS (CASTED)

GT13E2 ZONE 2 INNER SHELL LEFT AND RIGHT

ZURNPOWER CAN PROVIDE **NEW MANUFACTURING AND REPAIRS OF GT13E2 ZONE 2**



GT13E2 EV BURNER / AEV BURNER and LANCES NEW MANUFACTURING / FLOW TEST AND PACKAGING



ZURNPPOWER CAN PROVIDE **NEW MANUFACTURING AND REPAIRS OF GT13E2 BURNERS AND LANCES**



GT13E2 ROTOR HEAT SHIELDS ALL ROWS



GT13E2 FRONT (BURNER) SEGMENT



GT13E2 STATOR HEAT SHIELDS ALL ROWS

ZURPOWER CAN PROVIDE **NEW MANUFACTURING AND REPAIRS OF GT13E2 STATOR AND ROTOR HEAT SHIELDS**

## INSTALLATION HARDWARE

TURBINE BLADING ASSEMBLY  
COMPRESSOR BLADING ASSEMBLY  
SPLIT LINE BOLTING  
CC ASSEMBLY  
CONSUMABLES



ZURPOWER CAN PROVIDE **NEW INSTALLATION / OVERHAUL MATERIAL FOR GT13E2**



GT13E2 ZONE 1 / ZONE 2 / FRONT SEGMENTS



GT13E2 TURBINE VANE CARRIER REPAIR



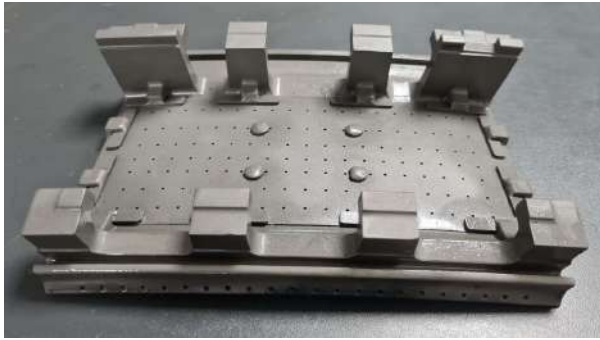
GT13E2 V96 BLADING



GT13E2 MXL VANES AND STATOR HEAT SHIELDS INSTALLED IN TVC



ZURNPPOWER CAN PROVIDE **NEW MANUFACTURING AND REPAIRS OF GT13E2 BLADES / VANES / TVC / ZONE 1 SEGMENT CARRIER**



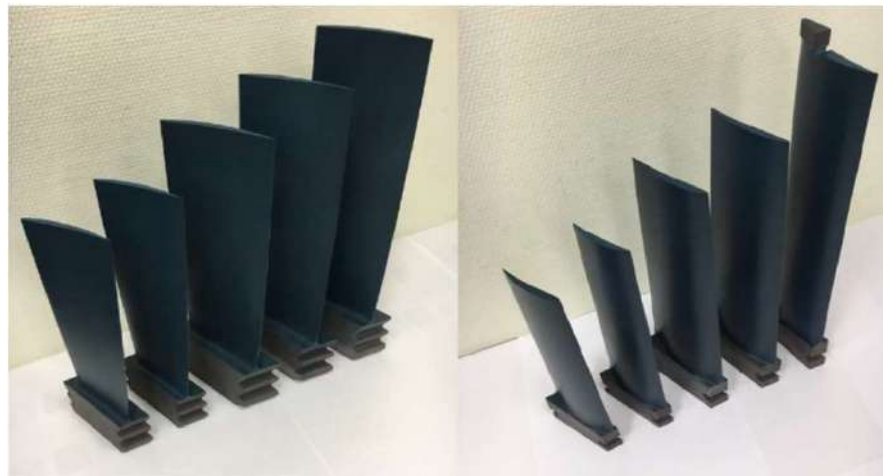
GT13E2 STATOR HEAT SHIELDS



GT13E2 EXHAUST GAS CASING



GT13E2 V96 BLADING



GT13E2 COMPRESSOR BLADING (COATED)  
INTERMEDIATE AND END PIECES AVAILABLE



GT13E2 BLADED ROTOR MXL



GT13E2 MOLDS FOR NEW MANUFACTURING



LIFTING OF GT CASING



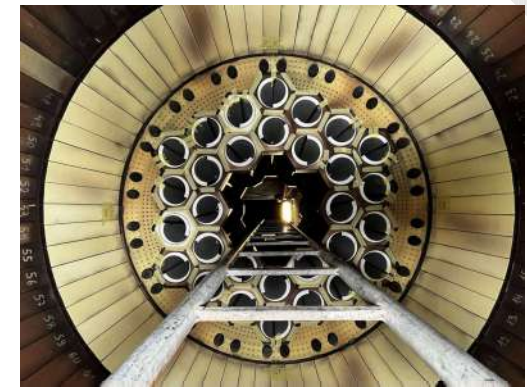
GT13E2 TURBINE VANE CARRIER



GT13E2 SHSS ALL ROWS



COMPRESSOR INTERMEDIATE AND END PIECES



BURNER ASSEMBLY

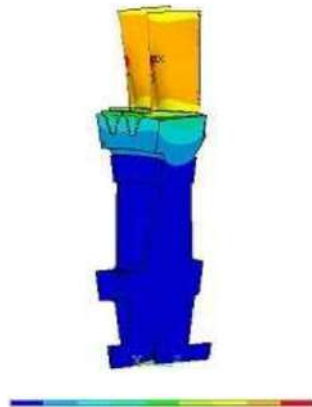
## GT13E2 BLADES & VANES Repair Program

### Turbine Blade Repairs and Upgrades

- Full coating upgrade with modern oxidation & corrosion resistant coatings
- Internal cleaning and coating for hollow blades extends total service life
- Blade tips weld-repaired with advanced technology process and superior filler alloys
- Full Solution Repair & HIP & heat treatment process to fully restore alloy strength

### Turbine Vane Repairs and Upgrades

- Full coating upgrade with modern oxidation & corrosion resistant coatings
- High strength, low distortion LPM crack repair and missing metal replacement technique
- Lean-correction and seal slot repair for aged vane-carrier induced damage
- Anti oxidation tip-seal upgrades for out-of-round vane carriers and casings



# COMPLETE CONFIGURATION MATRIX FOR ALL 13E2 VERSION

## GT13E2 Component Configuration Matrix

Reco or New	Row ID	Part Quantity	Part ID	V96	VA	XL	1/5MXL	3/5MXL	MXL(3.0)	MXL(3.1)	MXL(3.2)	MXL2	U1	Status	Reco Relation	Technical Description	Reason	Special Remark
<b>MBA01HB100 - ROTOR</b>																		
NEW		1	HTCZ700005R0001											Released		FC_GT13E2 WELLE EINBAUFERTIG W/O BLADES		FC Forecast dummy number
<b>MBA30HA100 - TURBINE HOUSING</b>																		
NEW		1	HTCZ700005R0030											Released		FC_GT13E2 TURBINENGEHAEUSE BEARB. NEU		FC Forecast dummy number
<b>MBA30HA200 - COMBUSTOR HOUSING</b>																		
NEW	GMD5143135R0001													Released		Material: CGC-40Mo		
NEW	HTCT323384R0901													Released		GGG40Mo w/c Blading		
NEW	HTCT323384R0902													Released		MXL2 - GGG-40MO CASING w/o vanes		
NEW	HTCT323384R0903													Released		MXL - STG41T CASING w/o vanes		
NEW	HTCT323384R0904													Released		MXL2 - STG41T CASING w/o vanes		
<b>MBA30HA300 - TURBINE VANE CARRIER</b>																		
NEW	HTCT000797R0004													Inactive				Replaced by HTCT022004R0001
NEW	HTCT152807R0002													Released				
RECOND	HTCT152807R0012													Released	incoming HTCT150914R0001 scrap replacement	INTERM RING A RECO ASSY		
NEW	HTCT152992R0002													Inactive				
RECOND	HTCT152992R0012													Released	incoming HTCT152673R0001 scrap replacement	INTERM RING B RECO ASSY		
NEW	HTCT152993R0003													Draft				
RECOND	HTCT152993R0013													Released	incoming HTCT152674R0002 scrap replacement	INTERM RING C RECO ASSY		

ZURNPOWER CAN SUPPLY **ALL PARTS FOR 13E2 MXL VERSION OF ANY TYPE**

## COMPLETE B AND C INSPECTION LIST OF PART REQUIRED

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3											
4	Description:	MXL Blades, Vanes, SHSS, RHS -									
5											
6											
7	<b>Line</b>	<b>Description</b>	<b>Part No</b>	<b>Unit</b>	<b>Qty</b>	<b>B insp</b>	<b>C insp</b>				
8	1	Blade Row 1	HTCT155944P0002	EA	63	0	63				
9	2	Gasket	HTCT250794R0001	EA	63	0	63				
10	3	Gasket	HTCT250794R0002	EA	63	0	63				
11	4	Gasket	HTCT250794R0003	EA	63	0	63				
12	5	Locking Bolt	GMD5448237P0001	EA	63	0	63				
13	6	Blade Row 2	HTCT155750R0002	EA	63	0	63				
14	7	Sealing Plate	GMD5448232R0001	EA	63	0	63				
15	8	Packing Strip	GMD5448345R0001	EA	63	0	63				
16	9	Locking Bolt	GMD5448238P0001	EA	63	0	63				
17	10	Blade Row 3	HTCT155751R0002	EA	63	0	63				
18	11	Sealing Plate	GMD5448234R0001	EA	63	0	63				
19	12	Packing Strip	GMD5448346R0001	EA	63	0	63				
20	13	Locking Bolt	GMD5448239P0001	EA	63	0	63				
21	14	Blade Row 4	HTCT252148R0002	EA	63	0	63				
22	15	Sealing Strip CPL Row 4	HTCT352836R0001	EA	63	0	63				
23	16	Locking Bolt	GMD5448239P0001	EA	63	0	63				
24	17	Blade Row 5	HTCT155699R0002	EA	63	0	63				
25	18	Sealing Strip CPL.Row 5	HTCT456890R0001	EA	63	0	63				
26	19	Locking Bolt	GMD5448240P0001	EA	63	0	63				
27	20	Rotor Heat Shield Segment A	GMD5443010P0001	EA	63	0	63				
28	21	Sealing Plate	GMD5448231P0001	EA	63	0	63				

Blade Vane & Heat shield | Bolting | Combustor parts | C nsp spares | Diffuser | Exhaust casing | comp rotor | comp stator | Blow off vlvs | Nozzle ... (+)

ZURPOWER CAN SUPPLY **COMPLETE HARDWARE FOR INSPECTION**

# COMPLETE GT13E2 FIELD SERVICE MANUAL

Document-No.	Rev	Title	Secti	Sectiontitles	G2	G20 G24	Ab G24
<b>Field Service Manual</b>							
<b>GT13E2</b>							
<b>Standard</b>							
Back    derived from: 1AHX 610 737							
<b>LIST OF DOCUMENTS</b>							
1AHX610737	E	List of Documents	010	List of Documents	x	x	x
<b>ERECTION STANDARDS</b>							
<b>ETS</b>							
1AHX614165	--	Erection Task Sequence C-Inspection	021	Erection Standards - ETS	x	x	x
1AHX614165_enclos.	--	Erection Task Sequence enclosures C-Inspection	021	Erection Standards - ETS	x	x	x
1AHX614168	--	Erection Task Sequence A/B-Inspection	022	Erection Standards - ETS	x	x	x
1AHX614168_enclos.	--	Erection Task Sequence enclosures A/B-Inspection	023	Erection Standards - ETS	x	x	x
<b>SCHEDULES</b>							
1AHX614166	B	Schedule - GT13E2 C-Inspection Standard	022	Erection Standards - Schedules	x	x	x
1AHX614169	A	Schedule - GT13E2 A/B-Inspection Standard	022	Erection Standards - Schedules	x	x	x
<b>TOOLS AND CONUMABLES</b>							
1AHX614167	--	Consumable List C-Inspection	023	Erection Standards - Tools and consumables	x	x	x
1AHX614167	--	Tools List C-Inspection	023	Erection Standards - Tools and consumables	x	x	x
1AHX614170_cons	A	Consumable List A/B-Inspection	023	Erection Standards - Tools and consumables	x	x	x
1AHX614170_tool	A	Tools List A/B-Inspection	023	Erection Standards - Tools and consumables	x	x	x
<b>SPARE PART LIST</b>							
<b>ITPL</b>							
HTCZ646468	--	GT13E2 MXL XL C-Inspection	025	Erection Standards - ITPL	x	x	x
HTCZ646383	--	GT13E2 / E2M STANDARD A/B - INSPECTION	025	Erection Standards - ITPL	x	x	x
<b>EXPECTED C-INSPECTION WORKS</b>							
1AHX612370	A	Expected C-Inspection Works GT Type 13E2	026	Erection Standards - Expected C-Inspection works	x	x	x
<b>TEST CERTIFICATES</b>							
<b>TEST CERTIFICATES MEASUREMENTS</b>							
GMD3998794	--	Measuring Certificate for insp. of GTVC deformation at GT13E1 / 1	031	Test Certificates - Measurements	x	x	x

# ZURNPOWER 13E2 COMPLETE FIELD SERVICE MANUAL

# COMPLETE GT13E2 LIFTING PLAN FOR C INSPECTION

## AGS LISTING PLAN FOR 13E2

### GT 13E2 MAIN EQUIPMENT BLOCK LIFTING/RIGGING SCHEDULE

1.	Insulation removal	22.	Bearings
2.	Silencer and acoustic casing removal	23.	Jack Support for exhaust casing
3.	<b>Acoustic panels and stairs</b>	24.	Hot end bearing disassembly
4.	Lub oil pipe drain	25.	Rotor and lifting assembly
5.	<b>FDS</b>	26.	Rotor slings
6.	FDS continued	27.	Rotor slings lift (contd)
7.	Compressor inlet casing top half	28.	Rotor slings lift (contd)
8.	Compressor inlet casing top half (contd)	29.	Rotor slings lift (contd)
9.	Thrust bearing	30.	Combuster lower part
10.	<b>GT casing exhaust casing</b>	31.	Combuster lower part (contd)
11.	<b>GT casing exhaust casing (contd)</b>	32.	GT vane carrier lower part
12.	<b>GT casing exhaust casing (contd)</b>	33.	GT vane carrier stretching tool
13.	<b>Blow off valves</b>	34.	Compressor diffuser lower half
14.	<b>Compressor casing and diffuser</b>	35.	Vane carrier turning
15.	<b>GT vane carrier upper</b>	36.	vane carrier turning (contd)
16.	<b>Annular combustor upper half</b>	37.	Vane carrier turning (contd)
17.	<b>Annular combustor upper half (contd)</b>	38.	Combuster turning
18.	<b>Annular combustor upper half (contd)</b>	39.	Combuster assembly
19.	Vane vcarrier & top clamp	40.	Combuster welding
20.	Compressor Vane Carrier, Upper	41.	Shaft cleaning and reblading
21.	Compressor Diffuser, Upper	42.	Removing blades and vanes
		43.	Cleaning shaft / vanes / blades

ZURNPOWER COMPLETE **LIFTING PLAN FOR 13E2**

## REFERENCE LIST

GT11D4/D5/DM/N1/N2/NM	GT13D/DM/D3A/DC+/E1/E2	GT8/8C2 / GT8	OTHER
COMBUSTIONS CHAMBER TILES (FINNED SEGMENTS) WITH AND WITHOUT SPRINGS WITH EXHAUST GAS CASING CLIENT USA & KSA	COMPRESSOR DIFFUSER & BURNERS WITH LANCES CLIENT IRAQ	HOT GAS CASING CLIENT AUSTIRA	C INSPECTION TOOLING FOR GT24 & GT26
TILE CARRIERS WITH INSTALLATION HARDWARE & BURNERS AND LANCES CLIENT USA	GT BLADES & VANES 13E2 CLIENT GERMANY	INNER LINER & COMPLETE INSTALLATION HARDWARE FOR MAYOR INSPECTION CLIENT SPAIN	TRANSITION PIECES AND LINERS FOR FR6 6581 CLIENT USA
HOT GAS CASING & LCCI & ENTRY SEGMENTS CLIENT USA	COMPRESSOR BLADES & VANES INCLUDING INTERMEDIATE AND END PIECES CLIENT UAE	EXHASUT GAS CASING CLIENT INDONESIA	INSPECTION TOOLING FOR Fr 9
BELT SEAL SEGMENTS AND ROTOR/STATOR HS CLIENT USA & KSA	ROTOR AND STATOR HEAT SHIELDS CLIENT ITALY	COMPRESSOR VANE CARRIER CLIENT POLAND	EXHASUT DIFFUSER Fr9
U-DUCT COMPLETE AND COMPRESSOR BLADES CLIENT USA & KSA	ZONE 2 COMBUSTION CHAMBER CLIENT ITALY	BURNERS AND LANCES CLIENT POLAND	GT24 COMPRESSOR VANE CARRIER AND EXHAUST GAS CASING CLIENT MEXICO
TURBINE VANE CARRIER AND GT VANES CLIENT KSA	HOT GAS CASING CLIENT HOLLAND	ROTOR J SEALS AND END PIECES FOR ROTOR CLIENT HOLLAND	GT26 INSPECTION TOOLING AND LABYRINTH SEALS CLIENT CHINA
EXHASUT DIFFUSE AND EXHAUST GAS CASING CLIENT USA	INNER/OUTER/FRONT SEGMENTS WITH RHSS AND SHSS CLIENT HOLLAND	INTERMEDIATE LINER CLIENT SPAIN	MS5001 EXHASUT DIFFUSER AND V94.2 BLADES GT CLIENT TAIWAN

## COMPLETE GT13E2 C INSPECTION TEAM AVAILABLE

OEM qualified specialists, who have experience in GT maintenance and overhaul:

- Outage Lead
- GT Mechanical Lead
- Blader Supervisor
- HGP Supervisor
- Generator Supervisor
- Assessment Supervisor
- GT Commissioning
- E&P Specialist
- Balancing Specialist etc.

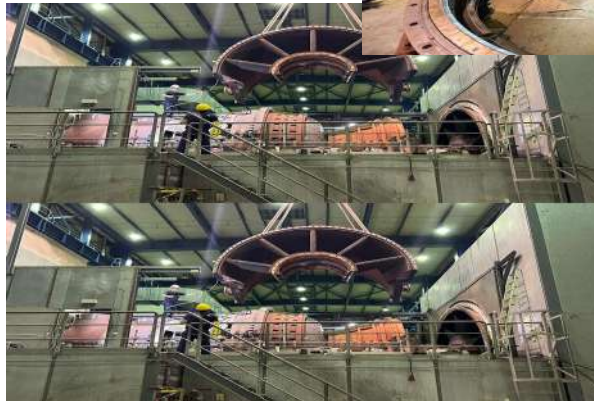
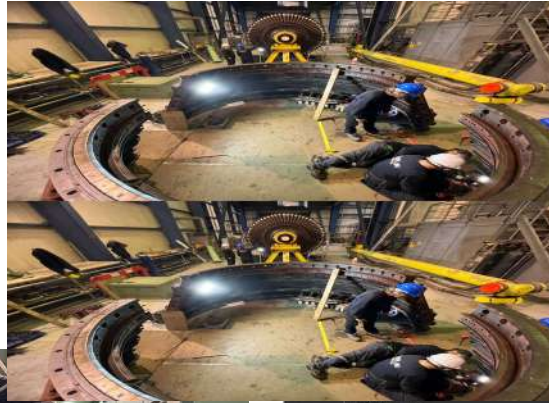


ZURPOWER CAN SUPPORT **WITH COMPLETE C INSPECTION MANPOWER**

## COMPLETE GT13E2 C INSPECTION TEAM AVAILABLE

OEM qualified specialists, who have experience in GT maintenance and overhaul:

- Outage Lead
- GT Mechanical Lead
- Blader Supervisor
- HGP Supervisor
- Generator Supervisor
- Assessment Supervisor
- GT Commissioning
- E&P Specialist
- Balancing Specialist etc.



ZURPOWER CAN SUPPORT **WITH COMPLETE C INSPECTION MANPOWER**

# QUALITY CONTROL

Quality engineers will control the parts during manufacturing processes

- dimensional measurement
- chemical composition analysis
- destructive tests (tensile test, hardness test, Charpy test, creep test)
- non-destructive tests (RT, UT, PT, MT, ET, metallography test)
- finalizing MQCP and ITP with Customer
- control all material before starting manufacturing
- control the parts during manufacturing based on holding points
- reporting Certificate of Conformity and final Quality Control Book to Customer



## COMPONENT ASSESSMENT & REPAIRS

- Performing and supervising periodic maintenance, hot gas path inspection, overhaul, LTE, and RI of various types of Gas Turbines
- Life cycle assessment of capital parts
- Refurbishing, rehabilitation, and renovation of power plants and equipment

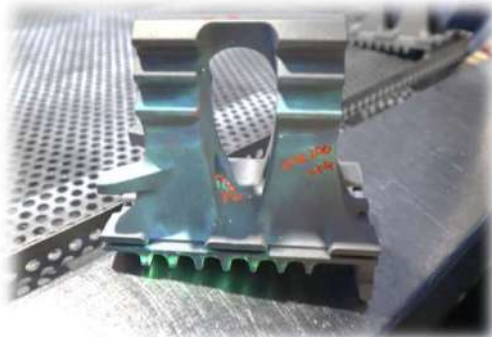
EU qualified experienced on Repair & Refurbishment

This process includes:

- Inspection
- Stripping
- Solution heat-treatment
- Blending
- Welding & Brazing
- Recoating
- Final heat-treatment
- Final inspection
- Reports



## COMPONENT ASSESSMENT & REPAIRS



## C INSPECTION TOOLING

VIGV tool – base load, start position, closed position

Cross arm

Arm brackets

Rotor stands

Calibration fixtures

Lifting out beams

Cable slings

Cross beams

Protective plates

Mounting devices, turbine left and right side



ZURPOWER CAN PROVIDE **C INSPECTION TOOLING**

Thank you.

# ZURNPOWER LLC

GT13E2 Parts, Repair & Field Service

Contact

+86 186 1687 9105

[hanson@robanalloy.com](mailto:hanson@robanalloy.com)

Wuxi, China