

## Fact Finding Report

Subject / Title:

**Special Inspection**

**CT-2022-0571**

Reference

Project: **POLO ENERGETICO ZARATE 23**

Shop Order No: **MB000169**

Event ID: **NA**

Period of Time: **2022-05-02 to 2022-05-04**

**Berlin**

**2022-05-05**

Place

Date

**Chengcheng Schleussner**

Author(s)

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Content Approved

Released

Protection Class: **Restricted**

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Brief Summary:

**The gas turbine MB000169 was conserved and stored in Hamburg harbour since 2016. Prior the delivery the conservation was renewed. During this procedure a boroscope inspection was performed to document the condition of the unit. This inspection was carried out on 03.05.2022. In general the unit was found in good condition.**

Distribution:

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## 1. Summary / Introduction

The gas turbine MB000169 was conserved and stored in Hamburg harbour since 2016. Prior the delivery the conservation was renewed. During this procedure a boroscope inspection was performed to document the condition of the unit. This inspection was carried out on 03.05.2022. In general the unit was found in good condition.

### Major Findings:

1. The outer surface of compressor vane carriers (CVCI and CVCII) was found with signs of surface corrosion.
2. The outer ring of VLe5 and the inner ring of VLe13 show spots with signs of corrosion.
3. The combustion chamber lower outer manhole cover and the lower inner manhole connecting elements were found with corrosion.
4. The burner supports were found with local areas of corrosion on the surface and at the contact surface to casing 2.
5. The gas passage of premix burners #10 and #14 were found with deposits, signs of oxidation and loose particles.
6. The seal strip 1 between TVC and casing 3 was found with signs of corrosion.

### Measures:

- 1.-4. The findings can be left as found.
5. After consulting with Siemens Energy Service Engineering, the findings can be tolerated for operation. To remove the particle in burner #10, the burner should be disassembled and a rinsing should be performed. The other option is to carry out a reverse blow out during commissioning.
6. The finding can be left as found.

## 2. Personnel

### 2.1. Siemens Energy Personnel

Name	Job Description	Shift	Date In	Date Out
Chengcheng Schleussner	CT Fact Finder_GFS_FC_NA-LA&APAC-EMEA	Day Shift	2022-05-02	2022-05-04

## 3. Unit Information

### 3.1. Unit Data

Turbine S.O. No	MB000169	Generator S.O. No	EG000228
Turbine Frame	SGT5-4000F(8)	Generator Frame	SGEN5-1200A 118/55
Rated Speed		Unit Configuration	
Fuel(s)		I&C-System	
Turboset was shut down at		Turboset was shut down on	

## 4. Findings / Recommendations

### Insp. Item 1 - Outer Overall Condition

#### Insp. Item 1.1 - Compressor Section

##### Finding

The compressor casing surface were found in good condition.

##### Photo Attachments



LHS compressor (1)



LHS compressor (2)



RHS compressor side (1)



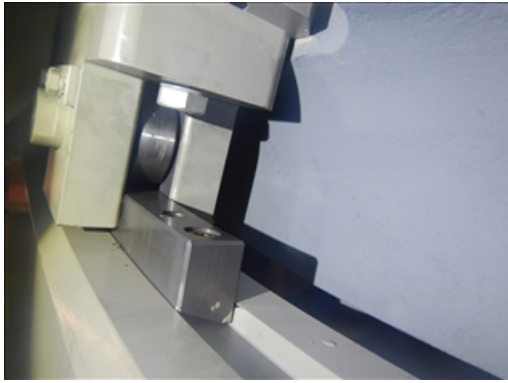
RHS compressor side (2)



IGV levers



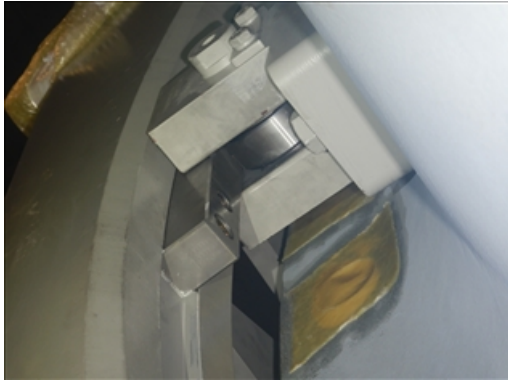
IGV bushing



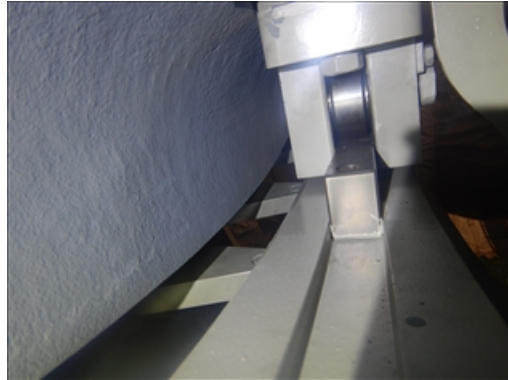
support roller (1)



support roller (2)



support roller (3)



support roller (4)

## Insp. Item 1.2 - Turbine Section

### Finding

1. The turbine exit casing (TEC) was found with signs of surface corrosion on several spots.
2. One half joint bolt was found with painting loss and corrosion.

### Recommendations

The findings can be left as found.

### Photo Attachments



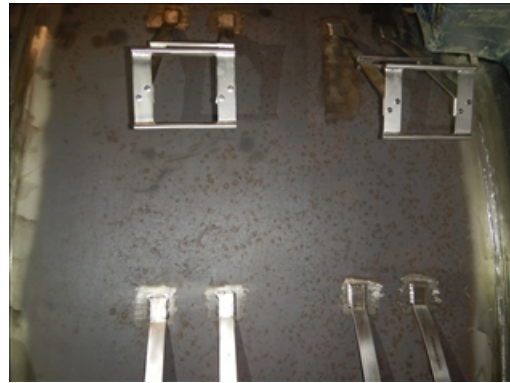
LHS turbine side



RHS turbine side



TEC (1)



TEC (2)



TEC (3)



turbine side half joint bolt (1)



turbine side half joint bolt (2)

## Insp. Item 2 - Inner Inspection

### Insp. Item 2.1 - Accessibilities

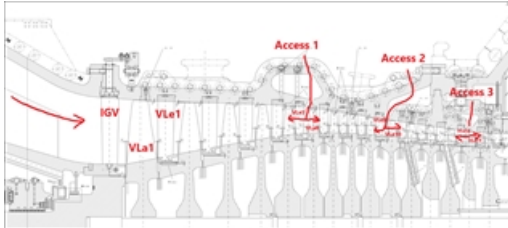
#### Finding

For the compressor inspection the openings were used as shown in pictures "Accessibilities" and "Accessibilities (1)".

For the premix burner gas passage inspection the gas pipe connection was used as shown in picture "premix burner gas passage".

The turbine was inspected from the turbine exit casing as shown in picture "turbine".

### Photo Attachments



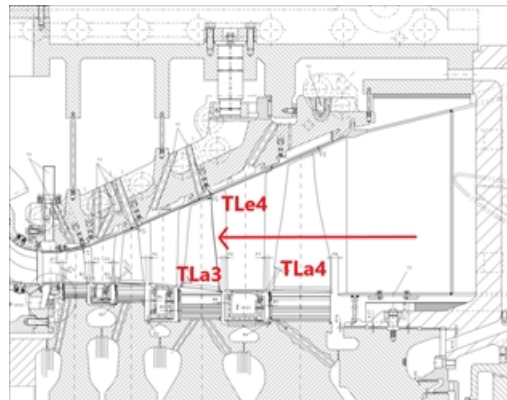
Accessibilities



Accessibilities (1)



premix burner gas passage



turbine

## Insp. Item 2.2 - Compressor

### Insp. Item 2.2.1 - Compressor Vane Carriers

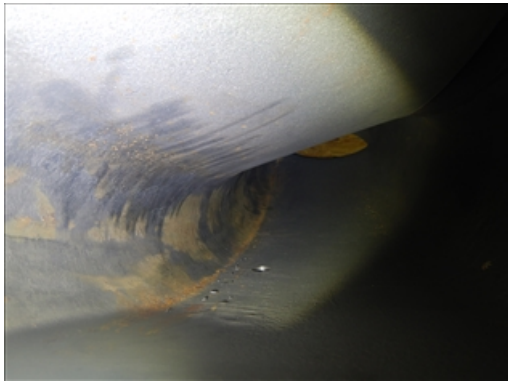
#### Finding

The outer surface of compressor vane carriers (CVCI and CVCII) was found with signs of corrosion.

#### Recommendations

The finding can be left as found.

## Photo Attachments



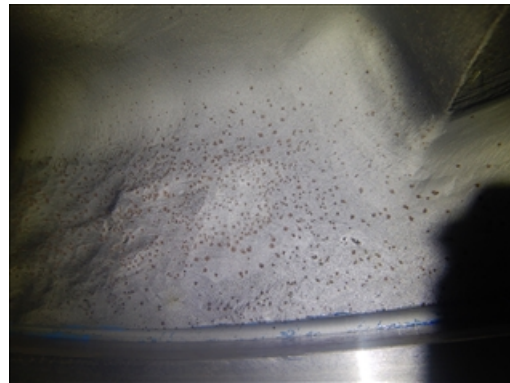
CVCII outer surface (1)



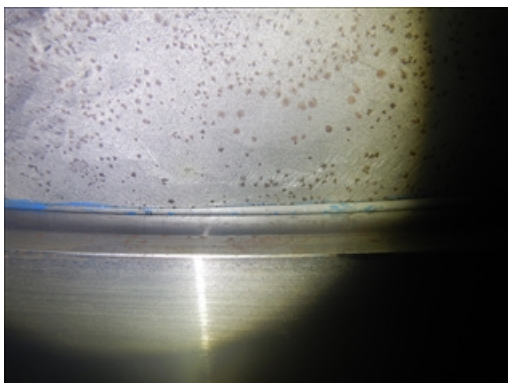
CVCII outer surface (2)



CVCII outer surface (1)



CVCII outer surface (2)



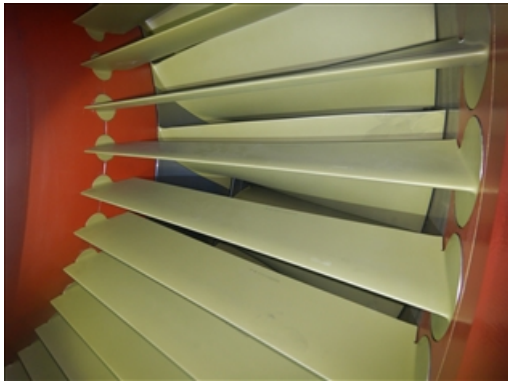
CVCII outer surface (3)

## Insp. Item 2.2.2 - IGV

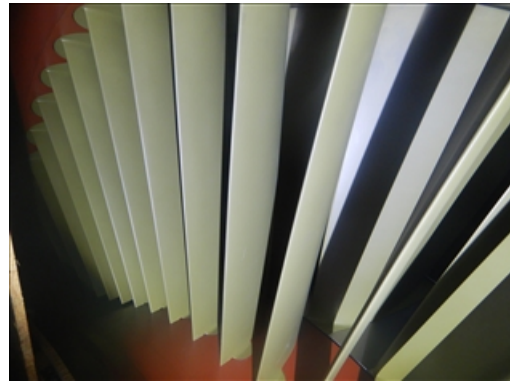
### Finding

The compressor inlet area/IGV area were found in good condition - No signs of corrosion were detected.

## Photo Attachments



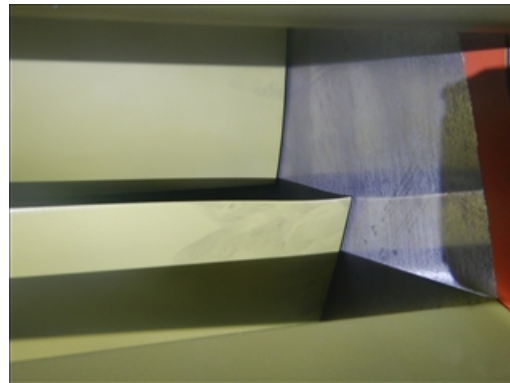
DSCN3208



DSCN3209



DSCN3210



DSCN3211

## Insp. Item 2.2.3 - Compressor Vanes

### Finding

The outer ring of VLe5 and the inner ring of VLe13 show spots with signs of corrosion.

### Recommendations

The finding can be left as found.

## Photo Attachments



VLe5\_outer ring



VLe13\_inner ring (1)



VLe13\_inner ring (2)

## Insp. Item 2.3 - Combustion System

### Insp. Item 2.3.1 - Manhole

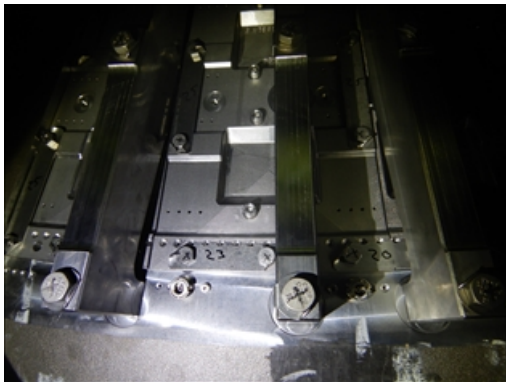
#### Finding

The lower outer manhole cover and the lower inner manhole connecting elements were found with corrosion.

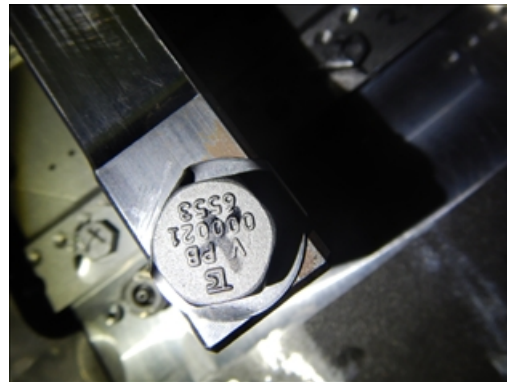
#### Recommendations

The findings can be left as found.

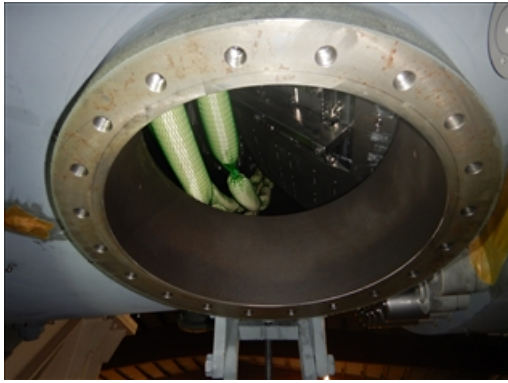
#### Photo Attachments



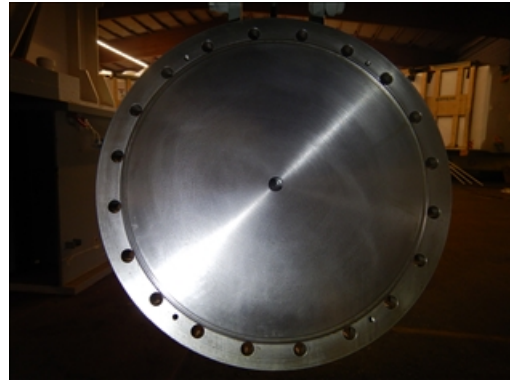
inner manhole (1)



inner manhole (2)



outer manhole (1)



outer manhole (2)



outer manhole (3)

### Insp. Item 2.3.2 - Burner Supports

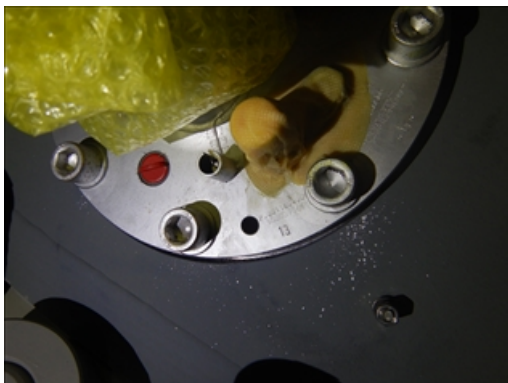
#### Finding

The burner supports were found with spots of corrosion on the surface and at the contact surface to casing 2.

#### Recommendations

The finding can be left as found.

#### Photo Attachments



Burner support (1)



Burner support (2)



Burner support (3)

### Insp. Item 2.3.3 - Premix Burners

#### Finding

The gas passages of two premix burners (position #10 and #14) were inspected. Following findings could be observed:

1. Both burners show brownish/reddish deposits in the vane holes. According to similar findings of MB000121, it could be assumed that the deposit here is oil either.
2. Slight corrosion in the ring channel could be observed.
3. Some loose particles (fuzz or metal chips) could be found. Burner at position #10 shows the the larger particle.

#### Recommendations

After consulting with Engineering, the findings can be tolerated for the operation. To remove the particle in burner #10, the burner should be disassembled and a rinsing should be performed. The other option is to carry out a reverse blow out during commissioning.

#### Photo Attachments



Burner #10\_inner channel (1)



Burner #10\_inner channel (2)



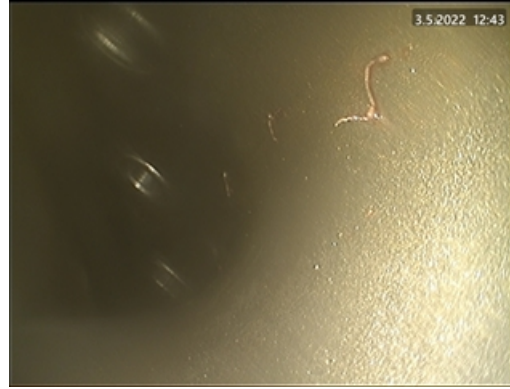
Burner #10\_inner channel (3)



Burner #10\_vane hole (1)



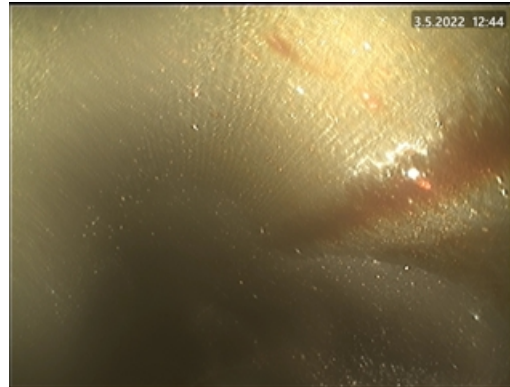
Burner #14\_ring channel (1)



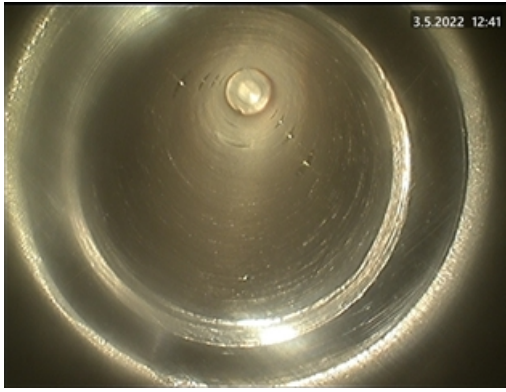
Burner #14\_ring channel (2)



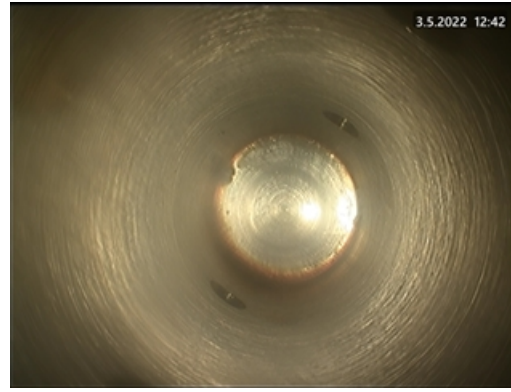
Burner #14\_ring channel (3)



Burner #14\_ring channel (4)



Burner #14\_vane hole (1)



Burner #14\_vane hole (2)



Burner #14\_vane hole

## Insp. Item 2.4 - Turbine Side

### Insp. Item 2.4.1 - Seal Strip 1

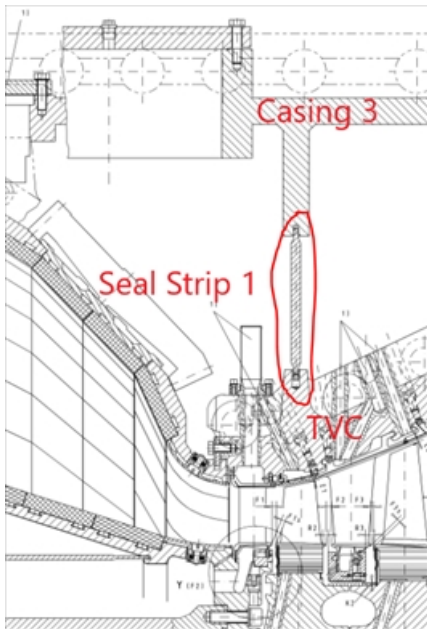
#### Finding

The seal strip 1 between TVC and casing 3 was found with signs of oxidation.

#### Recommendations

The finding can be left as found.

**Photo Attachments**



Seal strip 1



seal strip 1 (1)



seal strip 1 (2)

**Insp. Item 2.4.2 - Turbine Blading**

**Photo Attachments**



TLa4 (1)



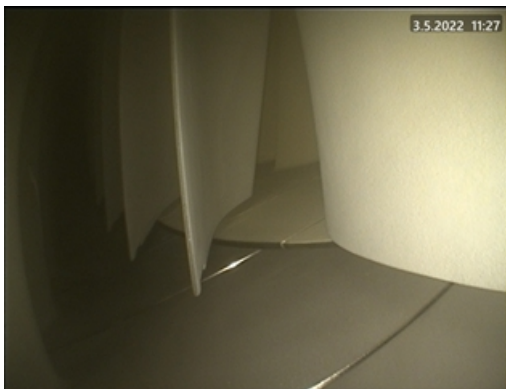
TLa4 (2)



2205030007



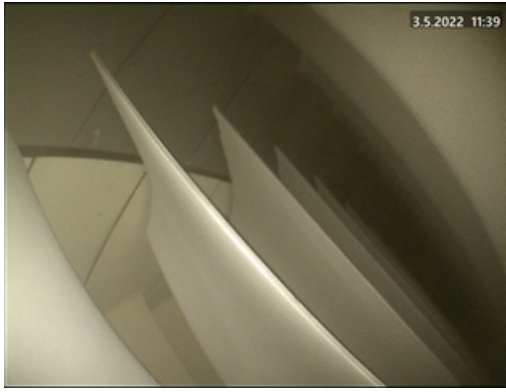
2205030008



2205030010



2205030012



2205030016



2205030017

## 5. Issues and Products

### 5.1. PCM Issues

PCM Issue	Description	Insp. Item	Status	Status Date
3-22-005911	Premix burner gas passage - deposits	2.3.3	Open	2022-05-05