Fact Finding Report

Subject / Title:

Special Inspection

CT-2024-1425
Reference

Berlin **2024-09-02**
Place Date

Project: **POLO ENERGETICO ZARATE 23**

Shop Order No: **MB000169**

Event ID: **NA**

Period of Time: **2024-09-02 to 2024-09-05**

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Author(s)

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Content Approved Released

Protection Class: **Restricted** AL: **N** ECCN: **N** Total Pages of Report: **19**

Brief Summary:

The gas turbine MB000169 has been preserved and kept in storage at Hamburg Harbour since 2016. Before its delivery, the conservation procedures were refreshed to guarantee optimal preservation. As part of this process, a boroscope inspection was performed on September 3rd, 2024, to evaluate and document the unit's condition. The inspection concluded that the turbine remains in good condition.

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1. Summary / Introduction

The gas turbine MB000169 has been preserved and kept in storage at Hamburg Harbour since 2016. Before its delivery, the conservation procedures were refreshed to guarantee optimal preservation.

As part of this process, a boroscope inspection was performed on September 3rd, 2024, to evaluate and document the unit's condition. The inspection concluded that the turbine remains in good condition.

Findings:

1. The turbine exit casing (TEC) exhibited signs of surface corrosion in several areas.

2. Two of the half joint bolts showed signs of paint loss and corrosion.

3. The outer surface of the compressor vane carriers showed signs of corrosion. The pictures were taken from the access points to compressor stages #5, #9, and #13.

4. The outer ring of VLe5 and the inner ring of VLe13 show signs of corrosion.
5. The lower outer manhole cover and the lower inner manhole connecting elements were found with signs of corrosion.
6. The burner supports were observed to have corrosion spots on their surfaces, particularly at the contact points with the casing and on the connecting elements.
7. The gas passages of three premix burners (burners #10, #12, and #14) were examined, leading to the following observations:

- The burners displayed brownish/reddish deposits in the vane holes.
- Slight corrosion was noted in the ring channel.
- Very small droplets of water were found in the inner channel of the burner #10.

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

Recommendation:

1.-8. The findings can be left as found.

2. Personnel

2.1. Siemens Energy Personnel

Name	Job Description	Shift	Date In	Date Out
Mehdi Taghrar	CT Fact Finder	Day Shift	2024-09-03	2024-09-06

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)	Dual Fuel	**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

Design group inspection according to Siemens Energy OEM guidelines indicates no findings.

Finding

The Compressor casing Surface, the IGV and the IGV support roller were found in good condition, no sign of corrosion.

Photo Attachments

RHS overview

RHS Compressor

RHS compressor (1)

LHS compressor side

RHS turbine side

RHS turbine side

LHS turbine side

RHS Burner part

IGV support roller

IGV support roller (1)

IGV ring

IGV levers

Insp. Item 1.2 - Turbine section

Design group inspection according to Siemens Energy OEM guidelines indicates following findings:

Finding

1. The turbine exit casing (TEC) exhibited signs of surface corrosion in several areas.

2. Two of the half joint bolts showed signs of paint loss and corrosion.

Recommendations

The findings can be left as found.

Photo Attachments

The turbine exit casing (TEC)

The turbine exit casing (TEC) (1)

The half joint bolt

The half joint bolt (1)

The half joint bolt (2)

Insp. Item 2 - Inner inspection

Insp. Item 2.1 - Accessbilities

Design group inspection according to Siemens Energy OEM guidelines indicates following findings:

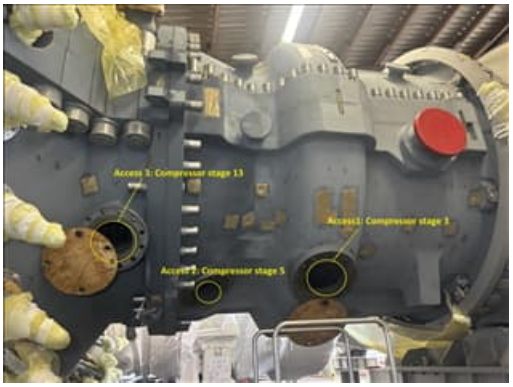
Finding

The compressor inspection was carried out through the openings at the compressor extraction points, as depicted in the images labeled "Accessibilities." These openings allowed for the examination of compressor stages #5, #9, and #13.

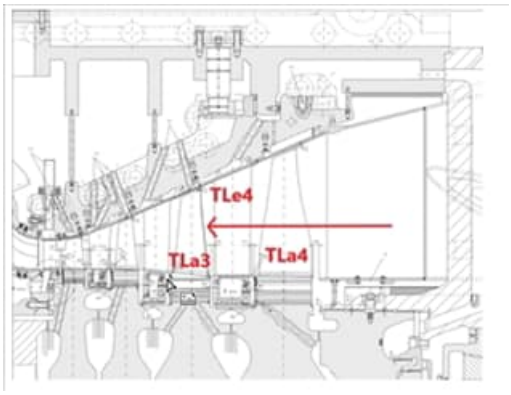
To inspect the gas passage of the premix burner, we accessed the gas pipe connection, as shown in the image titled "Premix Burner Gas Passage." A boroscope was used to inspect three premix burners: #10, #12, and #14.

Additionally, the turbine inspection was performed through the turbine exit casing, illustrated in the image labeled "Turbine Accessibilities."

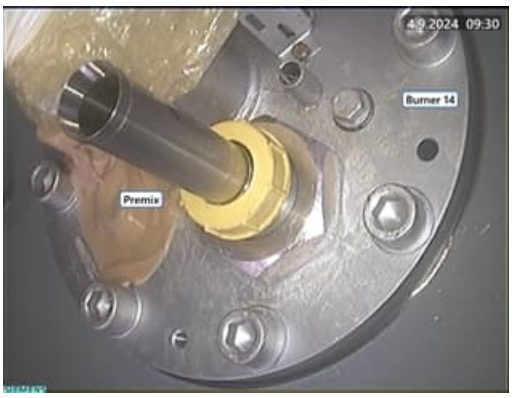
Photo Attachments



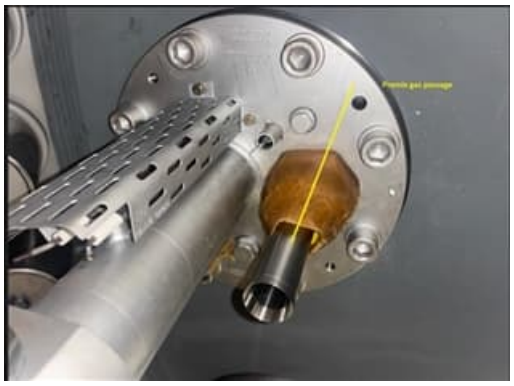
Accessibilities



Turbine accessibilities



Burner #14 overview



Premix gas passage burner #12

Insp. Item 2.2 - Compressor

Design group inspection according to Siemens Energy OEM guidelines indicates following findings:

Insp. Item 2.2.1 - Compressor vane carriers

Finding

The outer surface of the compressor vane carriers showed signs of corrosion. The pictures were taken from the access points to compressor stages #5, #9, and #13.

Recommendations

The finding can be left as found.

Photo Attachments

2409040054

2409040056

IMG_4927

IMG_4935

IMG_4959

IMG_4966

Insp. Item 2.2.2 - IGV and compressor inlet

Finding

The compressor inlet area and the IGV region were assessed to be in good condition, with no indications of corrosion observed.

Recommendations

The findings can be left as they are, with ongoing monitoring to be conducted during future inspection.

Photo Attachments

IMG_4812

IMG_4814

IMG_4816

IMG_4829

IMG_4835

IMG_4845

Insp. Item 2.2.3 - Compressor vanes

Finding

The compressor inlet area and the IGV region were assessed to be in good condition, with no indications of corrosion observed.

Recommendations

The findings can be left as they are, with ongoing monitoring to be conducted during future inspection.

Photo Attachments

Compressor stage #9 (1)

Compressor stage #9 (2)

Compressor stage #9 (3)

Compressor stage #5

Compressor stage #5 (1)

Compressor stage #5 (2)

Compressor stage #5 (3)

Compressor stage #13.

Insp. Item 2.3 - Combustion system

Design group inspection according to Siemens Energy OEM guidelines indicates following findings:

Insp. Item 2.3.1 - The lower inner and outer manhole

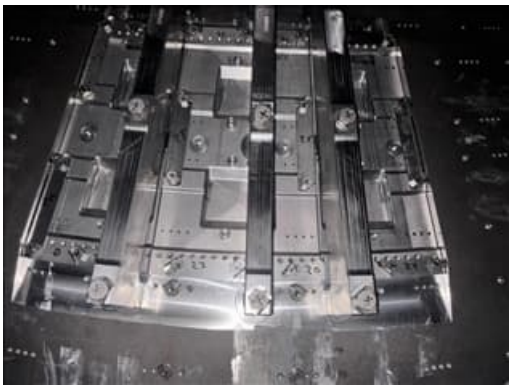
Finding

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

Recommendations

The finding can be left as found.

Photo Attachments

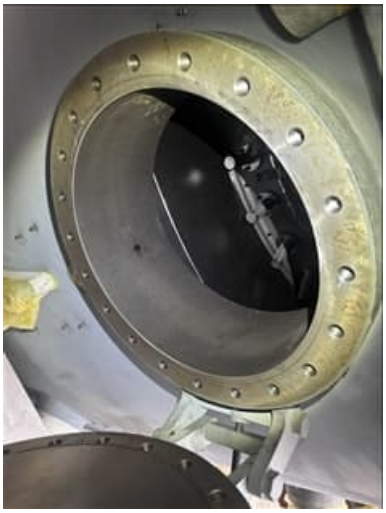


The lower inner manhole

The lower inner manhole (1)

The lower outer manhole

The lower outer manhole (1)



The lower outer manhole (2)

The lower outer manhole (3)

Insp. Item 2.3.2 - Burner supports

Finding

The burner supports were observed to have corrosion spots on their surfaces, particularly at the contact points with the casing and on the connecting elements.

Recommendations

The finding can be left as found.

Photo Attachments

Burner overview

Burner support

Burner support (1)

Burner support (2)

Burner support (3)

Insp. Item 2.3.3 - Premix burners gas passage and inner channel

Finding

The gas passages of three premix burners (positions #10, #12 and #14) were examined, leading to the following observations:

1. The burners displayed brownish/reddish deposits in the vane holes.

2. Slight corrosion was noted in the ring channel.

3. Very small droplets of water were found in inner chanel of the burner #10.

Recommendations

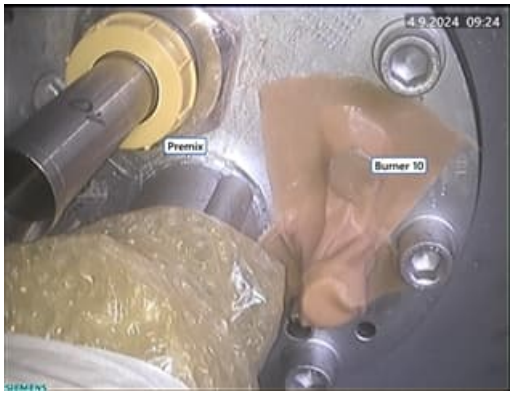
The finding can be left as found.

Photo Attachments

Burner #12 Premix gas passage

Burner #12 inner Chanel

Burner #12 inner Chanel (1)



Burner #10

Burner #10 Premix gas passage

Burner #10 inner Chanel

Burner #10 inner Chanel (1)

Burner #10 inner chanel with droplets of water

Burner #14 Premix gas passage

Burner #14 inner Chanel

Burner #14 inner Chanel (1)

Burner #14 inner Chanel (2)

Insp. Item 2.4 - Turbine side

Design group inspection according to Siemens Energy OEM guidelines indicates no findings.

Insp. Item 2.4.1 - Turbine blading

Photo Attachments

Tla4 overview

TLa 4

TLa4 (1)

TLa4 (2)

2409040209

2409040214

2409040218

2409040219