



*New Vision for Technical Services
New Engineering Vision for Contracting
NDT Services – Heat Treatment- Training*

AES (Amman East Power Plant)

Gas Turbine No. 1

**Maintenance & Inspection of Rotor & Combustion
Chamber Lifting Beams**

■ **With ANSALDO**

Performed

ON

Between

18/10/2021 & 23/10/2021

By

ASNT level III

Eng. Ahmad Abu Doush

ASNT ID: 229992

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الرؤيا الهندسية الحديثة للمقاولات
فحوصات لا اتلافية، معالجة حرارية ، تدريب
شارع الحرية - عمان
هاتف 4200220 - فاكس 4200221

Ref: 50/reports/2021
Date: 23/10/2021

To: Dears ANSALDO ENERGIA
AES Site/ Jordan

Subject: Painting and NDT for Lifting Beams and their components.

Please find below NDT report for GT rotor lifting devices and its components and combustion chamber lifting device inspection , painting and reservation.

The procedure as below:

- Sand blasting for beams and components.
- Visual testing for beams welding joints and components
- PT Visible, solvent removable for lifting devices and their components
- PT Visible , water washable for bolts and nuts
- Painting of the beams and components /many layers (Primer- undercoat final layers
- Painting the unpainted components (bolts, nuts) by corrosion prevention layer and plastic cover (Reservation).

Regards

Eng. Ahmed Abu Doush
ASNT level III (UT, PT, MT and VT)
ASNT ID: 229992

New Engineering Vision contracting Company

الرؤيا الهندسية الحديثة للمقاولات
New Engineering Vision for Contracting



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1- Abbreviations Used In NDT

Ultrasonic test	(UT)
Magnetic particle inspection	(MT)
Penetrant test	(PT)
Visual test	(VT)
Eddy current test	(ET)
Radiographic testing	(RT)
Leak Test	(LT)
Acoustic emission	(AE)

1- Rotor & Combustion Chamber Lifting Beams before maintenance

Layout

Combustion Chamber lifting beam before maintenance



Rotor lifting beam Components
before maintenance



2- Sand Blasting for lifting beams and their components

Sand Blasting was performed for the beams and components

Combustion Chamber lifting beam after sand blasting



Rotor lifting beam after sand blasting



3- VT for Beams welding Joints after Sand Blasting

Rotor Lifting Beam

No indications in welding joints



No indications



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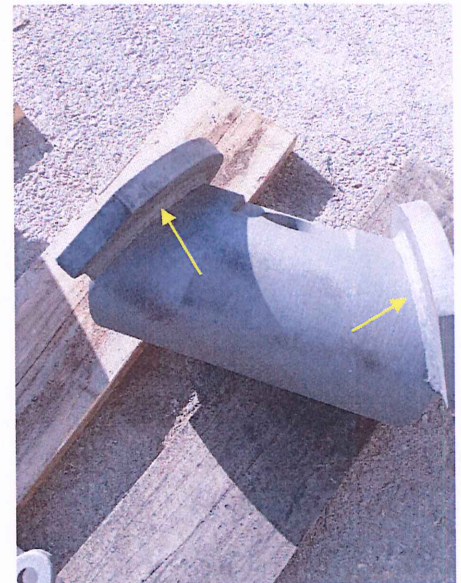


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Component
VT
Good
No Indications



Component
No Indications



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No indication in the components



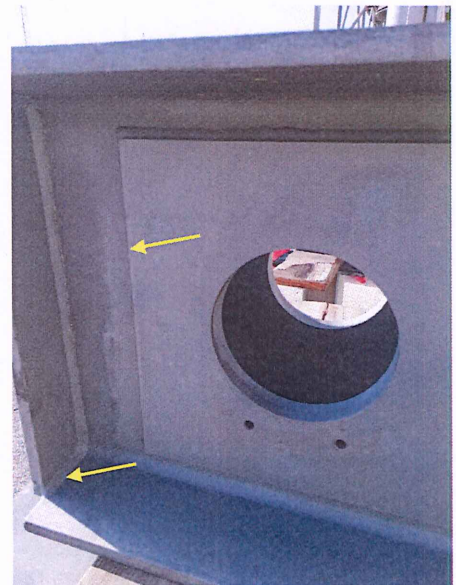
Combustion Chamber lifting beam

Combustion Chamber
Lifting Beam
VT Inspection

No indications in the welding



No indications in the welding



No indications



4- PT test for welding joints:

PT tests were performed for combustion chambers lifting beam and rotor lifting beam using the following Types & methods.

Type II method C (Visible, Solvent removable) red dye penetrant test was performed for all welding Joints for right part pipes welding Joints

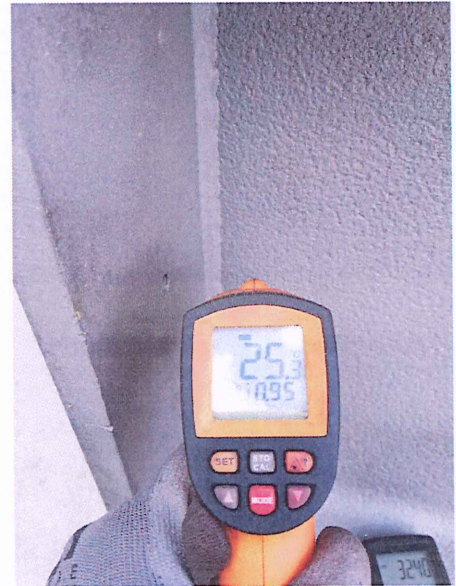
Consumable materials used:

Cleaner	Magnaflux- Cleaner/remover SKC-S
Penetrant	Magnaflux SKL-SP2
Developer	Magnaflux SKD-S2

Rotor lifting beam PT test:

Test Conditions;

Temperature of the parts to be inspected
 $25\text{ }^{\circ}\text{C} < 52\text{ }^{\circ}\text{C}$ - accepted



White light intensity
2390 Lux > 1000 Lux - Accepted

Test conditions meet the standards





Penetrant application

Application was in all welding joints



Penetrant application for all components



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Developer application



Developer



PT Test Results:

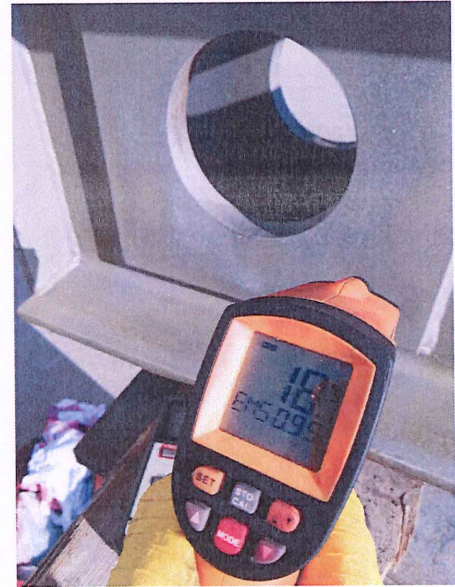
No Indications in the welding joints of the beam and components

Combustion Chamber lifting beam PT test:

Same method and materials were used

Test conditions

Temperature
18 °C accepted



Penetrant application



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Developer application



Developer



5- Bolts and nuts inspection

Layout



The following tests were done for Bolts and nuts

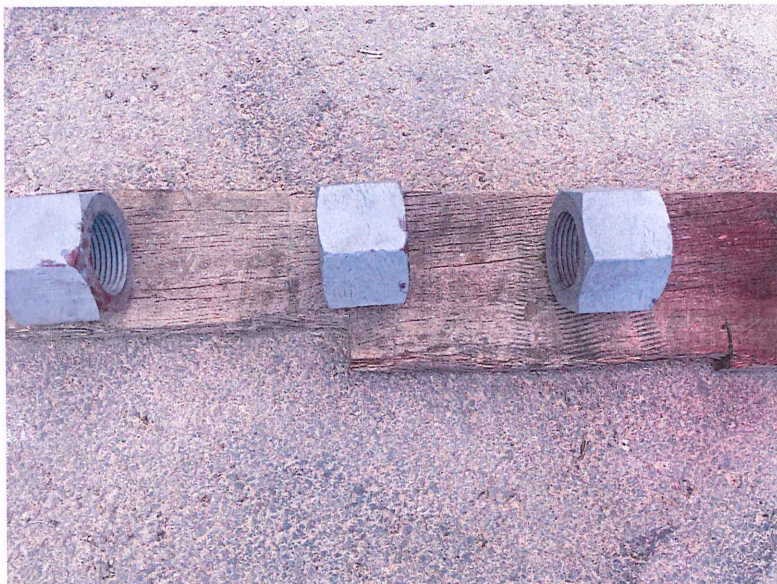
- VT
- PT

VT test for bolts:

No indications



Nuts
No Indications



PT test for Bolts and Nuts

Type II method A (Visible, water washable red dye penetrant test) was performed for all for bolts and nuts

Consumable materials used:

Cleaner	Magnaflux- Cleaner/remover SKC-S
Penetrant	Magnaflux SKL-WP2
Developer	Magnaflux SKD-S2

Test conditions same the above conditions, meet the Standards

Penetrant application

Bolts



Penetrant application

Nuts



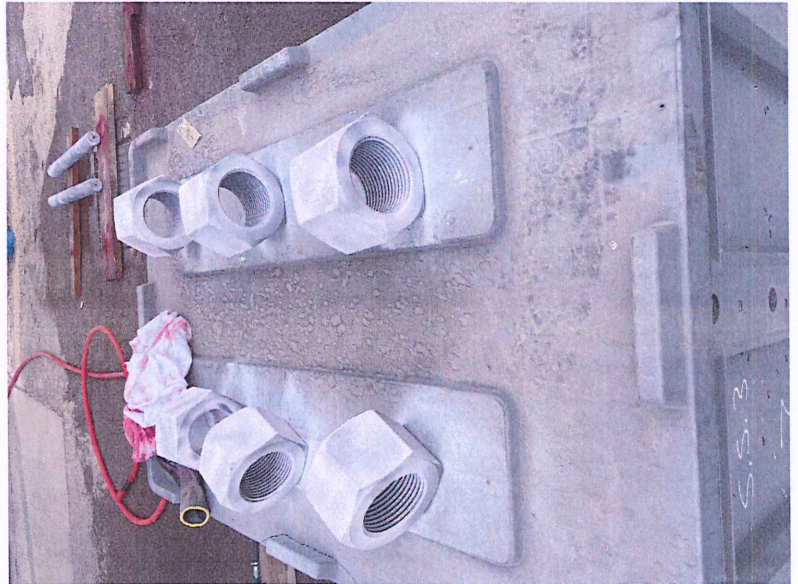
Penetrant application
Bolts & Nuts



Developer application



Developer application



Developer

No Indications –
In Bolts and nuts

Accepted





6- Inspection Forms LIQUID PENETRANT TEST REPORT

JOB DETAILS

Client : AES		Rotor lifting beam	
Component:		Test Report No.:- ANS PT -	
Location of Work Site :- AES		Test Date:- 20/10/2021-21/10/2021	
Procedure Number :- NVTF PT-1		Acceptance Standard :- ASME Section VIII	
Job Description: Form	GT rotor lifting beam and its components		
Job Temperature :-25 °C	Surface Condition :- as welded		
Material :- Steel	Stage of Inspection	/ In-service	
Pre cleaning Technique:-	Cleaned and prepared by solvents		

WORK DETAILS

	Penetrant		Developer/ Non aqueous	Cleaner	
	Visible	Fluorescent		Type	Water / Solvent
Penetrant System	Visible	Fluorescent		Water / Solvent	
Brand	Magnaflux- SKL- SP2		Magnaflux – SKD-S2	Solvent- SKC-S	
Method of Application	Spraying		Spraying		
Time (minutes)			Dwell Time: 10 minutes	Dev. Time: 10 minutes	
UV light intensity	μw/cm2		White light intensity	2390 Lux	

OBSERVATIONS:

SR NO	JOB IDENTIFICATION	OBSERVATION*	RESULT
			Accept / Reject
	GT rotor Lifting beam welding Joints	No Indications	Accepted
	GT Rotor Lifting beam components welding Joints	No Indications	Accepted

Use: Legend - RI: Relevant Indications, NRI: Non Relevant Indications, L: Linear, R: Rounded

INTERPRETATION AND EVALUATION DONE BY

		Name	Sign	Date
Tested by	NDT level II	Mahmoud Abu Hashem Abdallah Alqtaishat		21/10/2021
Approved By	ASNT Level III ID:229992	Eng. Ahmed Abu Doush		21/10/2021





LIQUID PENETRANT TEST REPORT

JOB DETAILS

Client : AES		GT Combustion Chamber Lifting Beam	
Component:		Test Report No.:- ANS PT -	
Location of Work Site :- AES		Test Date:- 20/10/2021-21/10/2021	
Procedure Number :- NVTF PT-1		Acceptance Standard :-	
Job Description: Form		Combustion Chamber lifting Beam	
Job Temperature :-25 °C		Surface Condition :- as welded	
Material :- Steel		Stage of Inspection / In-service	
Pre cleaning Technique:-		Cleaned and prepared by solvents	

WORK DETAILS

Penetrant System	Penetrant		Developer/ Non aqueous	Cleaner	
	Visible	Fluorescent		Type	Water / Solvent
Brand	Magnaflux- SKL- SP2		Magnaflux – SKD-S2	Solvent- SKC-S	
Method of Application	Spraying		Spraying		
Time (minutes)			Dwell Time: 10 minutes	Dev. Time: 10 minutes	
UV light intensity	µw/cm2		White Light intensity	2390 Lux	

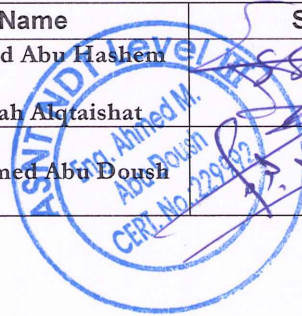
OBSERVATIONS:

SR. NO	JOB IDENTIFICATION	OBSERVATION*	RESULT
			Accept / Reject
	Combustion Chamber Lifting beam welding Joints	No Indications	Accepted

Use: Legend - RI: Relevant Indications, NRI: Non Relevant Indications, L: Linear, R: Rounded

INTERPRETATION AND EVALUATION DONE BY

		Name	Sign	Date
Tested by	NDT level II	Mahmoud Abu Hashem Abdallah Alqtaishat		21/10/2021
Approved By	ASNT Level III ID:229992	Eng. Ahmed Abu Doush		21/10/2021





LIQUID PENETRANT TEST REPORT

JOB DETAILS

Client : ANSALDO/AES		GT rotor lifting beam bolts and nuts	
Component: Mixing Chamber		Test Report No.:- ANSALDO PT-	
Location of Work Site :- AES		Test Date:- 20-21/10/2021	
Procedure Number :- NVTF PT-1		Acceptance Standard :- ASME Section VIII	
Job Description: Form		GT rotor lifting beam inspection bolts and nuts.	
Job Temperature :-25.0 C		Surface Condition :- as welded	
Material :-Steel		Stage of Inspection / In-service	
Pre cleaning Technique:-		Cleaned and prepared by solvents	

WORK DETAILS

	Penetrant		Developer/ Non aqueous	Cleaner	
Penetrant System	Visible	Fluorescent		Type:	Water / Solvent
Brand	Magnaflux- SKL- WP2 WW		Magnaflux – SKD-S2	Solvent- SKC-S	
Method of Application	Spraying		Spraying		
Time (minutes)			Dwell Time: 10 minutes	Dev. Time: 10 minutes	
UV light intensity	$\mu\text{w}/\text{cm}^2$			Light intensity: 2390 Lux	

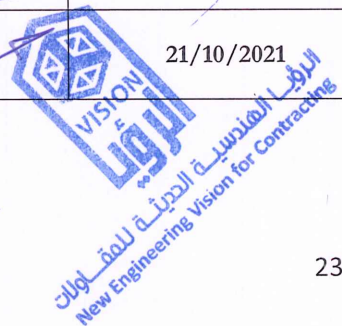
OBSERVATIONS:

SR NO	JOB IDENTIFICATION	OBSERVATION*	RESULT
			Accept / Reject
	GT Rotor Lifting Beam Bolts	No indications	Accepted
	GT Rotor Lifting Beam Nuts	No Indications	Accepted

Use: Legend - RI: Relevant Indications, NRI: Non Relevant Indications, L: Linear, R: Rounded

INTERPRETATION AND EVALUATION DONE BY

		Name	Sign	Date
Tested by	NDT level II	Eng. Abdallah Alqtaishat		21/10/2021
	NDT level II	Mahmoud Abu Hashem		21/10/2021
Approved By	ASNT Level III ID:229992	Eng. Ahmed Abu Doush		21/10/2021



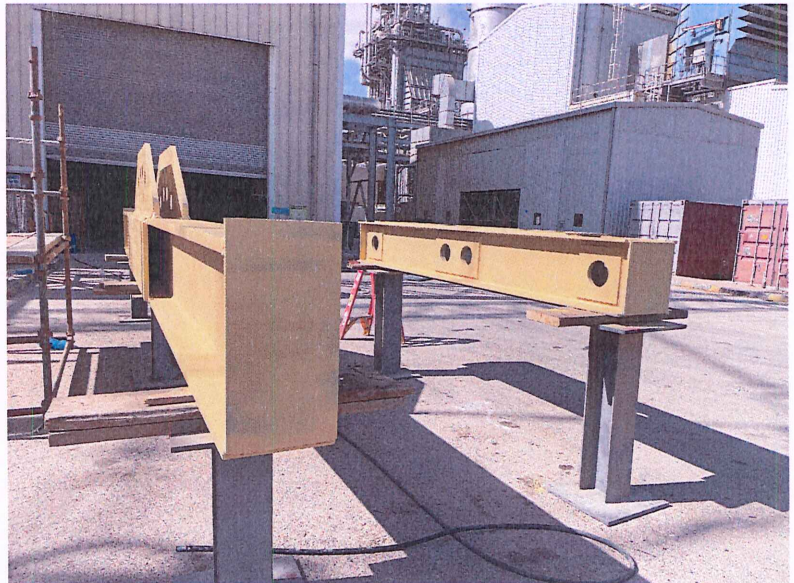
7- Painting of lifting Beams and components

Many layers according to painted beams and their components requested by ANSALDO

After beams and their components sand blasted, were cleaned and prepared for painting.

Paint was applied by Spraying
The coating structure consists of several layers, there is drying time between layers.
First layer: primer layer /Gray color

Then Undercoat (under coat layer) (base coat) with Hardener



Undercoat (over primer layer)
for components



Tope coat

There are Filler layers to
reach final layer

Filler layer



A Filler layer for components

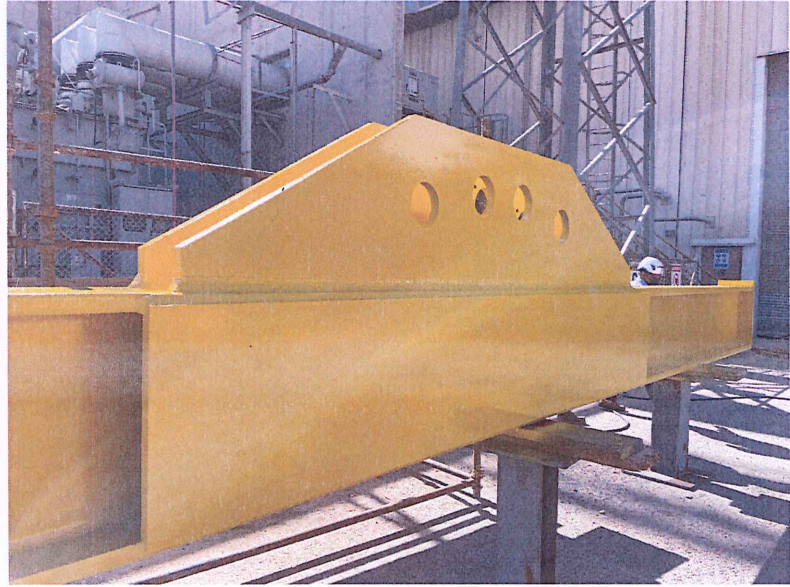


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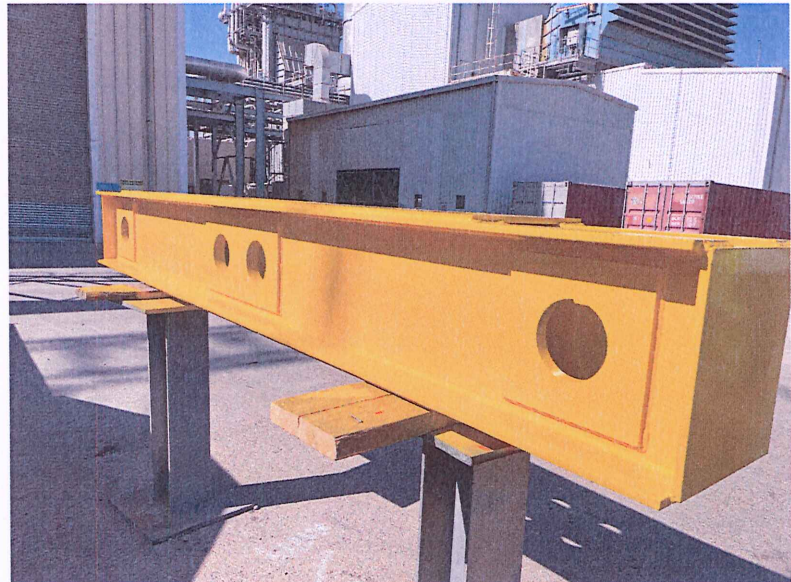


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Another layer



New layer



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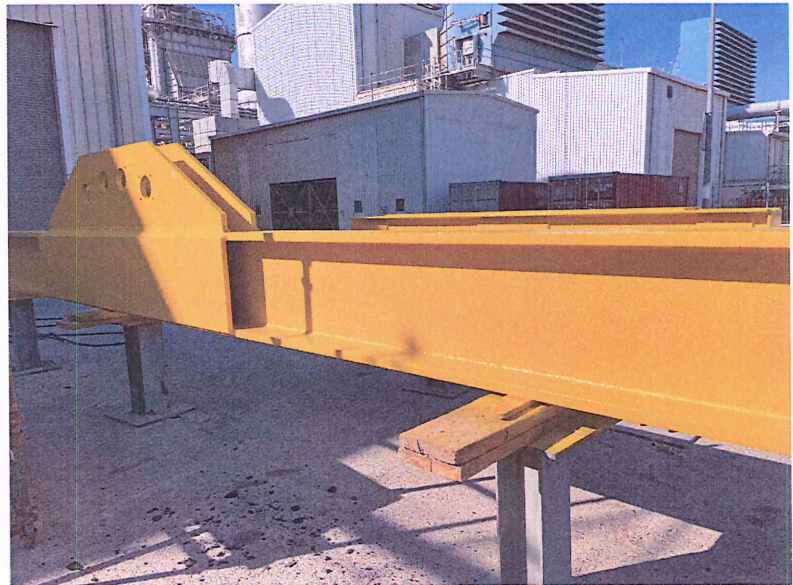


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Final paint layer
combustion Chamber lifting
Device



Lifting device for Rotor



Rotor lifting device
components final layer



Remaining Components



8-Reservation of lifting Beams and components

All parts are reserved

Bolts and Nuts were painted by (long lasting corrosion prevention)



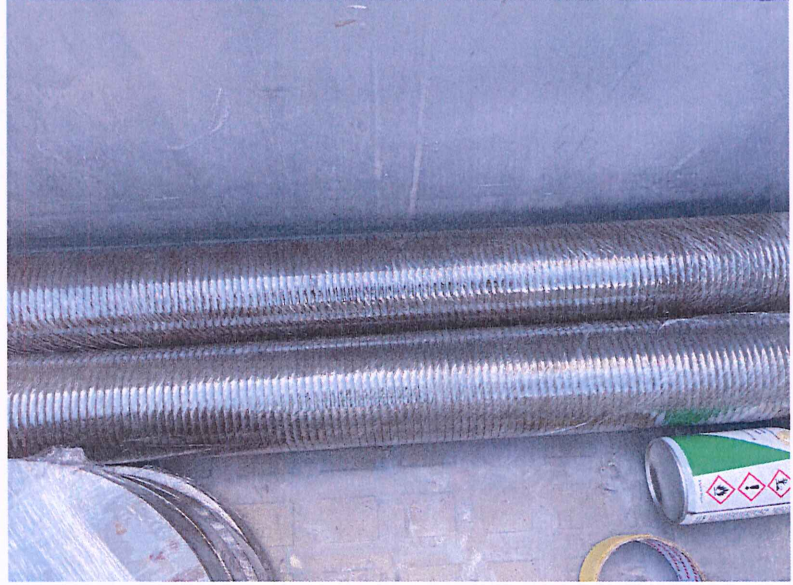
Accessory parts were painted by corrosion prevention and covered by a plastic layer for more protection



Bolts

Protection

By corrosion prevention
layer and plastic cover



Pines

Protection

Corrosion prevention and
plastic cover

