Port of Salalah, Oman

Crane Structure Cracks

Repair QA Report

Crane No. QC08

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1. Introduction

Based on below detects finding list which inspection was drafted and performed by APMT CES team in early August, totally 46 cracks were detected for QC08 in Port of Salalah.

As these cracks are quite critical which most of them were remarked as the priority A level, which must to be repaired immediately.

For more details about the inspection guide line and finding list, please refer to the "*Appendix 1 - Deficiency Finding List-QC08*" and "*Appendix 2 – QC08 Structure Inspection official report of Salalah port project*"

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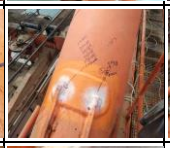
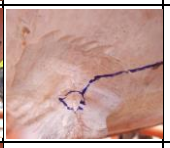
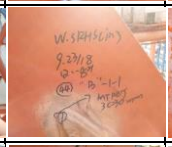
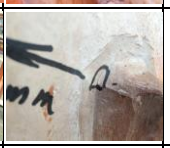
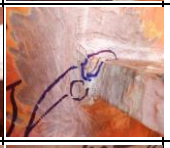
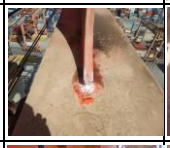
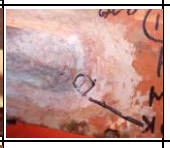
QC08# Inspection Finding List

S/N	Picture 1	Picture 2	Picture 3	Inspections Performed	Location	Description for the Deficiency Findings	Category of the Findings
1				MT	Gantry	3C=35mm were detected from lower equalizer beam in LS	A
2				MT	Gantry	1C=6mm was detected of upper equalizer beam of No.2 in LHS, LS	B
3				MT	Portal beam	1C=10mm was detected from the horizontal portal beam inner side of RHS	A
4				MT	Sill beam	2p=10mm were deteced from the sill beam of RHS, LS	C
5				MT	Sill beam	2C=50mm were deteced from the sill beam of LHS, LS	A
6				MT	Portal bracing	1C=25mm was detected from the diagonal tie links where connected with portal beam and leg in LHS	A
7				MT	Portal bracing	1C=20mm was detected from the diagonal tie links where connected with portal beam and leg in LHS	A
8				MT	Portal bracing	1C=70mm was detected from the diagonal tie links where connected with portal beam and leg in RHS	A

9				MT	Portal bracing	1C=20mm was detected from the diagonal tie links where connected with portal beam and leg in RHS	A
10				MT	Portal bracing	1C=15mm was detected from the diagonal tie links where connected with portal beam and leg in RHS	A
11				MT	Leg	1C=20mm was detected from the leg where connected with the sill beam in WS,LHS	A
12				MT	Leg	1C=10mm was detected from the leg where connected with the sill beam in LS,LHS	A
13				MT	Back stay	3C=20mm were detected from the WS, stay bar of right hand down side	A
14				MT	Back stay	1C=20mm was detected from the WS, stay bar of right hand up side	A
15				MT	Back stay	1C=10mm was detected from the WS, stay bar of right hand up side	A
16				MT	Back stay	1C=5mm was detected from the WS, stay bar of left hand down side	B
17				MT	Back stay	1C=20mm was detected from the WS, stay bar of left hand down side	A
18				MT	Back stay	2C=20mm were detected from the WS, stay bar of left hand UP side	A
19				MT	Back stay	1C=5mm was detected from the WS, stay bar of left hand down side where connected with girder beam	B
20				MT	Back diagonal	1C=10mm was detected from the Fixed tie links -Diagonal to portal beam of up side, (inner side, LS, RHS)	A
21				MT	Back diagonal	2C=15mm were detected from LS, RHS	A

22				MT	Portal bracing	1C=30mm was detected from the wedling of portal bracing which joint TGSB in LS, LHS	A
23				MT	Portal bracing	1C=30mm was detected from the wedling of portal bracing which joint TGSB in LS, LHS	A
24				MT	Portal bracing	3C= 30mm were detected from the wedling of portal bracing which joint TGSB in WS, RHS	A
25				MT	Portal bracing	1C=10mm was detected from the wedling of portal bracing which joint TGSB in WS, LHS	A
26				MT	Portal bracing	1C=15mm was detected from the diagonal support bar welds where connected with leg and grider from WS, RHS	A
27				MT	Portal bracing	3C=160mm were detected from the diagonal support bar welds where connected with leg and grider from LS, RHS	A
28				MT	Portal bracing	2C=30mm were detected from the diagonal support bar welds where connected with leg and grider from LS, LHS	A
29				MT	Back diagonal	1C=15mm was detected from the fixed tie link where connected from A-frame and LS, TGSB in down side	A
30				MT	Back diagonal	1C=20mm was detected from the fixed tie link where connected from A-frame and LS, TGSB in UP side in RHS	A
31				MT	Portal bracing	4C=60mm were detected from the fixed tie link support where connected with LS, TGSB in RHS	A
32				MT	Portal bracing	2C=60mm were detected from the fixed tie link where connected from A-frame and LS, TGSB in left down side in LHS	A
33				MT	Portal bracing	2C=10mm were detected from the fixed tie link where connected from girder beam in LHS	A
34				MT	Boom hinge	2C=30mm were detected from the fixed tie link where connected from girder beam in RHS	A

35				MT	Boom hinge	1C=10mm was detected from hing joints of RHS	A
36				MT	Boom hinge	1P=30mm was detected from hing joints of LHS	A
37				MT	Boom hinge	1C=240mm was detected from hing joints of right hand side	A
38				MT	Boom hinge	1C=200mm was detected from hing joints of left hand side	A
39				MT	Boom hinge	1C=80mm was detected from hing joints of right hand side	A
40				MT	Boom hinge	1C=70mm was detected from hing joints of left hand side	A
41				MT	A-frame	1C=20mm was detected from A-frame support weld of left side where connected with WS, TGSB	A
42				MT	A-frame	1C=15mm was detected from A-frame pulley support weld of right hand side	A
43				MT	Boom hinge	1P=25mm was detected from hing joints of right hand side where connected with the boom portal beam	A
44				MT	TGSB	1C=15mm was detected from the welding in LS, TGSB	A
45				MT	Boom	1C=50mm was detected from the weld between rail support and boom tip in RHS	A
46				MT	Boom	1C=50mm was detected from the weld between rail support and boom tip in LHS	A

Remarks code for further actions

1 **A – Requires immediate attention**
2 **B – Requires urgent attention (within shortest time span)**
3 **C – Requires to be attended at earliest convenience**

2. QA work scope of CES

2.1 Assist review of the welding repair work procedure

- Refer to "*Weld Cracks Repairing Procedures for ZP05-592 Oman Salalah Crane*"
- Refer to "*Structural Parts Weld Cracks Repairing Procedures for ZP08-1146 APMT Salalah STS*"
- Refer to "*Leg Weld & Parent Metal Cracks Repair & Reinforce Procedures for ZP08-1146 APMT Salalah STS*"
- Refer to "*Pipe Seal Plate Weld Cracks Repairing Procedures for ZP08-1146 APMT Salalah STS*"
- Refer to "*WPS-SMAW*"
- Refer to "*Crane structure crack repair Procedure-suggested*"

2.2 Assist to plan the manpower, tools and consumable list based on the work scope.

- Reference to "Crane structure crack repair tool list"

2.3 On site welding repair quality control and NDT double inspection prior and after the repair work

- Crack remove inspection and MT double check after grinding
- Reheating treatment control prior to welding
- Welding quality control (welding rod, welding data monitoring)
- Preheating treatment after welding control
- MT inspection for the final weld
- Painting quality control and inspection during the repair

3. On-site Photos records

		
VT inspection after crack removed by grinding	*MT inspection after crack removed by grinding*	*MT inspection after crack removed by grinding*
		
Welding consumable temperature have been checking	*Welding data of welding machine have been monitoring*	*Crack repaired by welding repairing in progress*

		
Preheating treatment before welding repairing	*Preheating treatment before welding repairing*	*Re-heating treatment after welding repairing*
		
VT inspection after crack repaired by welding repairing	*MT inspection after crack repaired by welding repairing*	*MT inspection after crack repaired by welding repairing*
		
Surface preparation inspection before primer	*Surface preparation inspection before top coating*	*Final inspection after top coating.*

4. Conclusion

By passing above inspection and QA work, here confirm that all these cracks have been repaired properly.

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