

PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed	CONTRACT REF. NO.:	LC241047A0
SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

PROVISION OF CORROSION MONITORING SERVICES

REPORT AT OFFSHORE LOCATION

Halul Island 1st Campaign

Contract No.: LC241047A0
Report Title: Corrosion Monitoring Report
Client: QatarEnergy
Facility: Halul Island
Service No./Date: Halul Island 1st campaign / 22nd June :
 3rd July 2025

APPROVED BY:

IBRAHIM MUZGHI
 BUSINESS DEV. MANAGER – INTEGRITY SOLUTIONS
 DATE APPROVE:

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1. EXECUTIVE SUMMARY

This report presents the results of the corrosion monitoring campaign conducted at Halul Island facilities under the current contract between Petromech and QatarEnergy. The work scope included retrieval, inspection, and replacement of corrosion monitoring coupons and probes, followed by comprehensive laboratory analysis and interpretation of results.

The campaign was carried out from 22nd June to 3rd July 2025 and covered a total of 19 corrosion monitoring locations across multiple operating units including MOL, NPG Unit, Tank Header Central Manifold, North and South Tank Farms, Old Metering Area, and API Pit.

Key observations and findings include:

- Details of access fitting locations and locations serviced as follows

Total Access Fitting Locations	Total Location Serviced		Total Location not Serviced
	Location fitted with Corrosion Coupon	Location fitted with Solid plug	
20	18	2	0

- All 18 coupons were successfully retrieved and replaced; access fittings were found in generally good condition.
- Two locations were found with solid plugs instead of coupons and were replaced with new ER probes and ladder coupons.
- General corrosion rates were mostly below 1 mpy, indicating satisfactory corrosion control performance.
- Moderate pitting (>5 mpy) was observed on coupon 50-XCC-1013 mounted on south Tank shell.
- The ER probe (XE-5003) on the 16" crude oil line remained in good condition and recorded a 0 mpy corrosion rate.
- Retrieval tools and access fittings were in fair condition considering their age (manufactured between 1991–1995), though some localized pitting was observed on tool barrels.

Overall, the corrosion condition at Halul Island remains within acceptable limits, and the monitoring system is functioning effectively. However, improvements in retrieval tool maintenance, bacterial testing, and optimized survey scheduling are recommended to further strengthen data reliability and system integrity.

2. INTRODUCTION

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This report represents the first corrosion monitoring service deliverable under the current contract and provides a comprehensive summary of corrosion monitoring activities conducted during the period 22nd June to 3rd July 2025. The work involved retrieval of corrosion monitoring coupons, detailed laboratory analysis, and interpretation of corrosion data in accordance with industry best practices and NACE standards (SP0775 and SP0103).

The retrieved coupons had been in continuous service since July 2023, exceeding the typical exposure duration recommended for weight-loss coupon monitoring (90–180 days). Such extended exposure may impact the representativeness of corrosion data due to surface scaling or film formation and could potentially affect the mechanical integrity of the corrosion access system.

3. SCOPE OF WORK

- Retrieve and replace, in a safe manner, 19 corrosion coupons from access fittings installed at Halul Island facilities.
- Service and clean access fittings using appropriate tools as recommended by RCS.
- Clean, preserve, and prepare retrieved coupons for laboratory analysis (pre-cleaning, post-cleaning, and weighing).
- Ensure work compliance with NACE SP0775 and NACE SP0103 standards.
- Provide QatarEnergy with technical evaluation of corrosion rates and recommendations for further investigation or system improvements.
- Maintain and pressure test all retrieval tools and valves post-service for quality assurance and safety

4. FIELD ACTIVITIES

4.1 Halul Island Corrosion Coupons Service Status

The details of corrosion coupons locations and the one serviced and not serviced provided in table (1) below

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Table (1)
Halul Island Corrosion Coupons Service Locations

Locations	No. Of Access Fitting Identified on Site	No. of Corrosion coupon Retrieved	No. of Solid Plug Retrieved with no Corrosion coupon installed	No. of New Corrosion Coupons Installed	No. of Locations Not Serviced
Halul MOL	1	1	0	1	0
Halul NPG Unit	2	2	0	2	0
Halul Tank Header Central Manifold	4	4	0	4	0
Halul North Tank Farms	5	4	1 ⁽¹⁾	5	0
Halul South Tank Farms	1	1	0	1	0
Halul Old Metering Area	2	1	1 ⁽²⁾	1	0
Halul API Pit	5	5	0	5	0
Total	20	18	2	19	0

- (1) 50-XCC-13001 18" Line to PS-1 Location was found fitted with solid plug only
- (2) 50-XCC-1017. Location was found fitted with solid plug only

Appendix - A provide comprehensive details of the services corrosion coupon locations in Halul Islands

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4.2 ER Probes

The details of Halul Island ER probes locations as shown in table 2 below.

Table (2) ER probe locations

No. of ER probe fitting	No. of ER probes Serviced	Remark
1	2	50-XCC-13001. Solid Plug removed, new 17.75" T10 Cylindrical ER Probe installed. Manual reading obtained to confirm operation

5. GENERAL OBSERVATIONS

- Retrieval tools were found in fair conditions. Retrieval Tool: S/N 10791 (18" 6000psi RBS) manufacturer in 1991 have a notable pitting on the inner barrel directly under the hammer
- Halul Island has only two active ER probe locations.
- External condition of access fittings and protective covers were generally satisfactory.

6. SURVEY FINDINGS AND ANALYSIS

- The ER probe (XE-5003) on the 16" crude oil line was in good condition; corrosion rate = 0 mpy.
- 50-XCC-13001 and 50-XCC-1017 were upgraded with new ER probe and ladder coupon holder respectively.
- General corrosion rates: <1 mpy for most locations (indicating good inhibitor performance).
- Moderate pitting (>5 mpy): observed on coupon 50-XCC-1013 (South Tank Shell).
- Coupon MP993 (50-XCC-1054) recorded negative corrosion rate — attributed to baseline weight deviation.
- Disc coupons (XR912–XR914) at the Tank Header Central Manifold and the pair of coupons MP997 and MQ 998 installed in location 50-XCC-1001 in Halul MOL showed minimal weight loss ($\sim 10^{-3}$ g) and negligible influence of coupon ultrasound and chemical cleaning.
- Comparison with 2023 survey data indicates similar corrosion behavior (low to moderate) except corrosion coupons installed at bottom of the Tank where 2023 data revealed higher corrosion rate. This could be attributed to settlement of the sludge , infrequent drainage of Tank or in effective inhibition at that time .
- Detailed results, photographs, and data tables are presented in Appendices B–J.

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7. COMPARISON OF CORROSION COUPON AND ER PROBE CORROSION RATE DATA

Corrosion monitoring data obtained from both corrosion coupons and Electrical Resistance (ER) probes installed on the 16" Crude Oil Line from PS-3 to Halul MOL indicate very low corrosion rates from both techniques.

The results in table (3) suggest that the internal corrosion activity within the line is minimal, confirming that the current corrosion control measures (e.g., chemical inhibition, flow management, and material selection) are effective under the present operating conditions.

Table (3) ER probe VS Corrosion Coupons Corrosion rate Comparison

Location	Line Description	Tag number	Type	Corrosion Rate mpy	Remark
Halul MOL	16" Crude Oil Line from PS-3	50-XCC-1001	Corrosion coupon	0.00	
		XE-5003	ER probe	0.003	

8. RECOMMENDATIONS

No.	Recommendation	Action Party
01	To consider replacing Retrieval Tool: S/N 10791 (18" 6000psi RBS) manufacturer in 1991 have a notable pitting on the inner barrel directly under the hammer	Offshore Corrosion
02	To clean access fitting covers biannually to avoid thread seizure from external corrosion.	Halul Maintenance
03	To Perform sessile bacterial testing for corrosion coupon 50XCC-1013 mounted on south Tank shell.	Offshore Corrosion
04	To retain coupon envelopes until final weighing to verify anomalies in baseline data.	Petromech
05	To plan quarterly retrieval surveys to improve data frequency and operational safety.	Offshore Corrosion

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9. CONCLUSION

The corrosion monitoring program at Halul Island was completed safely and successfully, achieving all planned objectives.

- The overall corrosion condition is satisfactory, with most corrosion rates below 1 mpy.
- Localized corrosion remains limited, and no severe pitting or MIC was identified.
- New ER probe and coupon were installed in a safely manner.
- Retrieval tools integrity and safety were maintained throughout the campaign.

These findings confirm that the corrosion control program and chemical treatment strategies in Halul facilities remain effective and stable. Continued routine monitoring and proactive maintenance will ensure the long-term integrity of these assets.

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APPENDIX – A

CORROSION COUPON LOCATIONS IN HALUL ISLAND

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Locations Details			Coupon Installation Details				Duration
S.N.	A/F Tag No.	Access fitting orientation	Coupon Type	Coupon Position	Coupon Install Date	Retrieval data	
Location: Halul MOL							
1	50-XCC-1001	Top Mounted 12-O Clock	3" Strip	BTM	14/07/2023	29/06/2025	716
Location: Halul NPG Unit							
2	50-XCC-1019	Top Mounted 12 O' Clock Flanged access fitting	3" Strip	BTM	11/07/2023	29/06/2025	719
3	50-XCC-1021	Top Mounted 12 O' Clock Flanged access fitting	3" Strip	BTM	11/07/2023	29/06/2025	719
Location: Halul Tank Header Central Manifold							
4	50-XCC-1000	Bottom Mounted 6 O' Clock	Disc Coupon	BTM	10/07/2023	27/06/2025	718
5	50-XCC-1003	Bottom Mounted 6 O' Clock	Disc Coupon	BTM	10/07/2023	27/06/2025	718
6	50-XCC-1006	Bottom Mounted 6 O' Clock	Disc Coupon	BTM	10/07/2023	27/06/2025	718
7	50-XCC-1009	Bottom Mounted 6 O' Clock	Disc Coupon	BTM	10/07/2023	27/06/2025	718

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Location: Halul North Tank Farms							
8	50-XCC-1018	Mounted in Tank Shell	Solid plug	Inward	n/a	30/06/2025	Install new coupon
			Solid plug	Mid	n/a	30/06/2025	Install new coupon
			Solid plug	Outward	n/a	30/06/2025	install new coupon
9	50-XCC-1018	Mounted in Tank Shell	2" Ladder	Inward	11/07/2023	30/06/2025	720
				Mid	11/07/2023	30/06/2025	720
				Outward	11/07/2023	30/06/2025	720
10	50-XCC-1020	Mounted in Tank Shell	2" Ladder	Inward	11/07/2023	30/06/2025	720
				Mid	11/07/2023	30/06/2025	720
				Outward	11/07/2023	30/06/2025	720
11	50-XCC-1022	Mounted in Tank Shell	2" Ladder	Inward	12/07/2023	01/07/2025	720
				Mid	12/07/2023	01/07/2025	720
				Outward	12/07/2023	01/07/2025	720
12	50-XCC-1023	Mounted in Tank Shell	2" Ladder	Inward	12/07/2023	01/07/2025	720
				Mid	12/07/2023	01/07/2025	720
				Outward	12/07/2023	01/07/2025	720

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Location: Halul South Tank Farms							
13	50-XCC-1013	Mounted in Tank Shell	2" Ladder	Inward	12/07/2023	29/06/2025	718
				Mid	12/07/2023	29/06/2025	718
				Outward	12/07/2023	29/06/2025	718
Location: Old Metering Area							
14	50-XCC-1049	Top Mounted 12-O Clock	3" Strip	BTM	14/07/2023	28/06/2025	715
Location: Halul API Pit							
15	50-XCC-1052	Top Mounted 12-O Clock	3" Strip	BTM	13/07/2023	07/07/2025	725
16	50-XCC-1053	Top Mounted 12-O Clock	3" Strip	BTM	13/07/2023	06/07/2025	724
17	50-XCC-1054	Top Mounted 12-O Clock	3" Strip	BTM	13/07/2023	07/07/2025	725
18	50-XCC-1055	Top Mounted 12-O Clock	3" Strip	BTM	13/07/2023	07/07/2025	725
19	50-XCC-1056	Top Mounted 12-O Clock	3" Strip	BTM	13/07/2023	06/07/2025	724

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APPENDIX – B

CORROSION COUPON ANALYSIS DATASHEET IN HALUL ISLAND

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RESULTS LISTING OF PROCESSED COUPONS												WCI Results								
Locations Details			Coupon Installation Details									Pre-Cleaning Weight (G)	Post-Cleaning Weight (G)	Coupon Extraction Date (Packet Date)	Duration	Weight Loss (g)	Corrected Weight Loss (g)	Corrosion Rate (mpy)	Pitting depth Mils	Pitting Rate (mpy)
SN	A/F Tag No.	Access fitting orientation	Coupon Type	Coupon material	Surface area of the coupon (in ²)	Density of the coupon (gm/cm ³)	Coupon Holder Model / Length	Coupon Position	Coupon Install Date	Coupon Serial No	Coupon Original weight (gm)									
1	blank	N/A	Disc Coupon	C 1018	2.5	7.86	N/A	N/A	N/A	N/A	17.384	17.3700	N/A	N/A	0.01		N/A	N/A	N/A	
2	Blank	N/A	3" Strip	C 1018	5.2	7.86	N/A	N/A	N/A	N/A	36.787	36.7770	N/A	N/A	0.01		N/A	N/A	N/A	
3	Blank	N/A	2" Ladder	C 1018	3.4	7.86	N/A	N/A	N/A	N/A	24.775	24.7640	N/A	N/A	0.01		N/A	N/A	N/A	

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HALUL ISLAND LOCATIONS																				
Location: Halul MOL																				
SN	A/F Tag No.	Access fitting orientation	Coupon Type	Coupon material	Surface area of the coupon (in ²)	Density of the coupon (gm/cm ³)	Coupon Holder Mode / Length	Coupon Position	Coupon Install Date	Coupon Serial No	Coupon Original weight (gm)	Pre-Cleaning Weight (g)	Post-Cleaning Weight (g)	Coupon Extraction Date (Packet Date)	Duration	Weight Loss (g)	Corrected Weight Loss (g)	Corrosion Rate (mpy)	Pitting depth Mils	Pitting Rate (mpy)
1	50-XCC-1001	Top Mounted 12-O'Clock	3" Strip	C 1018	5.2	7.86	6200 - 14.75"	BTM	14/07/2023	MP997	36.6825	36.693	36.6760	29/06/2025	716	0.0065	0.0035	0.002663	0.004	0.00214
					5.2	7.86			14/07/2023	MQ998	36.9544	36.966	36.9470	29/06/2025	716	0.0074	0.0026	0.001979	0.042	0.0215
Location: Halul NPG Unit																				
2	50-XCC-1019	Top Mounted 12 O'Clock Flanged access fitting	3" Strip	C 1018	5.2	7.86	6200 - 12.25"	BTM	11/07/2023	MP961	36.9636	36.980	36.9260	29/06/2025	719	0.0376	0.0276	0.020916	0.421	0.2136
					5.2	7.86			11/07/2023	MP962	36.6323	36.646	36.6050	29/06/2025	719	0.0273	0.0173	0.013110	0.042	0.0215
3	50-XCC-1021	Top Mounted 12 O'Clock Flanged access fitting	3" Strip	C 1018	5.2	7.86	6200 - 12.50"	BTM	11/07/2023	MP963	36.7751	36.791	36.7340	29/06/2025	719	0.0411	0.0311	0.023568	1.901	0.9652
					5.2	7.86			11/07/2023	MP964	36.7428	36.759	36.7100	29/06/2025	719	0.0328	0.0228	0.017278	0.421	0.2136

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DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

Location: Halul Tank Header Central Manifold																				
SN	A/F Tag No.	Access fitting orientation	Coupon Type	Coupon material	Surface area of the coupon (in ²)	Density of the coupon (gm/cm ³)	Coupon Holder Model / Length	Coupon Position	Coupon Install Date	Coupon Serial No	Coupon Original weight (gm)	Pre-Cleaning Weight (g)	Post-Cleaning Weight (g)	Coupon Extraction Date (Packet Date)	Duration	Weight Loss (g)	Corrected Weight Loss (g)	Corrosion Rate (mpy)	Pitting depth Mils	Pitting Rate (mpy)
4	50-XCC-1000	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	10/07/2023	XR912	17.4521	17.467	17.4450	27/06/2025	718	0.0071	0.0029	0.004578	0.004	0.0021
5	50-XCC-1003	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	10/07/2023	XR913	17.3657	17.369	17.3560	27/06/2025	718	0.0097	0.0003	0.000474	0.246	0.12512
6	50-XCC-1006	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	10/07/2023	XR914	17.3737	17.383	17.3690	27/06/2025	718	0.0047	0.0053	0.008366	0.042	0.0215
7	50-XCC-1009	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	10/07/2023	ZK887	17.3745	17.392	17.3590	27/06/2025	718	0.0155	0.0055	0.008682	0.718	0.3652

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PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed	CONTRACT REF. NO.:	LC241047A0
SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

Location: Halul North Tank Farms																				
SN	A/F Tag No.	Access fitting orientation	Coupon Type	Coupon material	Surface area of the coupon (in ²)	Density of the coupon (gm/cm ³)	Coupon Holder Model / Length	Coupo n Positio n	Coupon Install Date	Coupon Serial No	Coupon Original weight (gm)	Pre-Cleaning Weight (g)	Post-Cleaning Weight (g)	Coupon Extraction Date (Packet Date)	Dura tion	Weight Loss (g)	Correcte d Weight Loss (g)	Corrosion Rate (mpy)	Pitting depth Mils	Pitting Rate (mpy)
8	50-XCC-1018	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inwar d	11/07/2023	VC933	24.9584	25.808	24.7500	30/06/2025	720	0.2084	0.1984	0.22963	0.000	0.0012
					3.4	7.86			11/07/2023	VC934	24.9074	25.326	24.3620	30/06/2025	720	0.5454	0.5354	0.619676	0.043	0.0215
					3.4	7.86		Mid	11/07/2023	VC931	24.5952	24.045	23.2880	30/06/2025	720	1.3072	1.2972	1.501389	0.641	0.3251
					3.4	7.86			11/07/2023	VC932	24.6637	24.492	24.2560	30/06/2025	720	0.4077	0.3977	0.460301	0.464	0.2352
					3.4	7.86	Outw ard	Outw ard	11/07/2023	AE372	24.7350	25.267	24.5130	30/06/2025	720	0.2220	0.2120	0.24537	0.000	0.00012
					3.4	7.86			11/07/2023	AE373	25.0800	24.829	24.3300	30/06/2025	720	0.7500	0.7400	0.856481	0.042	0.02147
9	50-XCC-1020	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inwar d	11/07/2023	AE374	24.8356	25.209	24.6210	30/06/2025	720	0.2146	0.2046	0.236806	0.000	0.000
					3.4	7.86			11/07/2023	AE375	24.7985	25.12	24.5710	30/06/2025	720	0.2275	0.2175	0.251736	0.000	0.000
					3.4	7.86	Mid	Mid	11/07/2023	AE376	24.4744	24.594	24.2820	30/06/2025	720	0.1924	0.18240	0.211111	0.002	0.00125
					3.4	7.86			11/07/2023	AE377	24.6507	24.705	24.4510	30/06/2025	720	0.1997	0.1897	0.21956	0.005	0.00254
					3.4	7.86	Outw ard	Outw ard	11/07/2023	AE378	24.4493	24.536	24.2780	30/06/2025	720	0.17130	0.16130	0.18669	0.000	0.000
					3.4	7.86			11/07/2023	AE379	24.8843	24.826	24.6580	30/06/2025	720	0.2263	0.2163	0.250347	0.000	0.000
10			2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inwar d	12/07/2023	AE297	24.7223	24.680	24.4030	01/07/2025	720	0.3193	0.3093	0.357986	0.000	0.000

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PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed	CONTRACT REF. NO.:	LC241047A0
SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

50-XCC-1022	Mounted in Tank Shell			3.4	7.86			12/07/2023	AE386	24.5209	24.465	24.2210	01/07/2025	720	0.2999	0.2899	0.335532	0.005	0.0023	
				3.4	7.86			12/07/2023	VL816	24.4769	24.484	24.0960	01/07/2025	720	0.3809	0.3709	0.429282	0.047	0.0236	
				3.4	7.86			12/07/2023	VL819	25.1594	25.180	24.7890	01/07/2025	720	0.3704	0.3604	0.41713	0.064	0.0325	
				3.4	7.86			12/07/2023	XX157	24.4688	24.175	23.9020	01/07/2025	720	0.5668	0.5568	0.644444	0.002	0.0012	
				3.4	7.86			12/07/2023	VL887	24.8438	24.486	24.2090	01/07/2025	720	0.6348	0.6248	0.723148	0.002	0.0012	
11	50-XCC-1023	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inward	12/07/2023	AE353	24.7642	24.999	24.6090	01/07/2025	720	0.1552	0.1452	0.168056	0.042	0.0214
					3.4	7.86			12/07/2023	AE354	24.6220	24.825	24.3350	01/07/2025	720	0.2870	0.2770	0.320602	0.025	0.0125
					3.4	7.86		Mid	12/07/2023	AE355	24.6429	24.588	24.1820	01/07/2025	720	0.4609	0.4509	0.521875	0.042	0.0214
					3.4	7.86			12/07/2023	AE356	24.5412	23.708	23.3780	01/07/2025	720	1.1632	1.1532	1.334722	0.730	0.3698
					3.4	7.86		Outward	12/07/2023	ZK848	24.6497	23.999	23.6900	01/07/2025	720	0.9597	0.9497	1.09919	1.900	0.9632
					3.4	7.86			12/07/2023	ZK849	24.6941	24.325	24.1630	01/07/2025	720	0.5311	0.5211	0.603125	0.000	0.000
Location: Halul South Tank Farms																				
12	50-XCC-1013	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inward	12/07/2023	AE307	24.7515	24.778	24.6430	29/06/2025	718	0.1085	0.0985	0.114322	3.341	1.6985
					3.4	7.86			12/07/2023	AE308	24.5910	24.573	24.4750	29/06/2025	718	0.1160	0.1060	0.123027	4.653	2.3652
					3.4	7.86		Mid	12/07/2023	AE309	24.9823	24.865	24.7780	29/06/2025	718	0.2043	0.1943	0.225511	10.468	5.3214
					3.4	7.86			12/07/2023	AE350	24.7228	24.660	24.5580	29/06/2025	718	0.1648	0.1548	0.179666	5.944	3.0215
					3.4	7.86		Outward	12/07/2023	AE351	24.8456	24.784	24.6660	29/06/2025	718	0.1796	0.1696	0.196843	0.305	0.1546

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PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed											CONTRACT REF. NO.:	LC241047A0		
SCOPE:	Corrosion Monitoring Services											REV. NO.:	1		
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island											SUBMISSION DATE:	17-11-25		

					3.4	7.86		12/07/20 23	AE352	24.6150	24.648	24.5750	29/06/2025	718	0.0400	0.0300	0.034819	0.002	0.0012	
13	50-XCC-1049	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-20.25"	BTM	14/07/20 23	MP995	36.7222	36.740	36.7040	28/06/2025	715	0.0182	0.0082	0.006249	0.042	0.0215
					5.2	7.86			14/07/20 23	MP996	36.8173	36.835	36.8060	28/06/2025	715	0.0113	0.0013	0.000991	1.931	0.9856
14	50-XCC-1052	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-7.25"	BTM	13/07/20 23	MP969	36.9175	36.929	36.9000	07/07/2025	725	0.0175	0.0075	0.005637	0.043	0.0215
					5.2	7.86			13/07/20 23	MP970	36.8386	36.85	36.8210	07/07/2025	725	0.0176	0.0076	0.005712	0.043	0.0215
15	50-XCC-1053	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-6.25"	BTM	13/07/20 23	MP967	36.9307	36.950	36.9190	06/07/2025	724	0.0117	0.0017	0.001279	0.461	0.232
					5.2	7.86			13/07/20 23	MP968	36.8939	36.919	36.8820	06/07/2025	724	0.0119	0.0019	0.00143	1.911	0.9632
16	50-XCC-1054	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-6.25"	BTM	13/07/20 23	MP993	36.6124	36.969	36.9090	07/07/2025	725	-0.2966	-0.3066	-0.23042	0.000	0.000
					5.2	7.86			13/07/20 23	MP994	36.9404	36.643	36.5780	07/07/2025	725	0.3624	0.3524	0.264845	0.043	0.0215
17	50-XCC-1055	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-4.25"	BTM	13/07/20 23	MP991	36.9784	36.840	36.7330	07/07/2025	725	0.2454	0.2354	0.176914	0.426	0.2145
					5.2	7.86			13/07/20 23	MP992	36.6834	36.552	36.4560	07/07/2025	725	0.2274	0.2174	0.163386	0.646	0.3254
18	50-XCC-1056	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-3.25"	BTM	13/07/20 23	MP965	36.6985	36.479	36.3200	06/07/2025	724	0.3785	0.3685	0.277328	0.646	0.325
					5.2	7.86			13/07/20 23	MP966	36.8181	36.554	36.3620	06/07/2025	724	0.4561	0.4461	0.335728	2.631	1.3265

LOW <1 mpy	MODERATE 1-5 mpy	HIGH 5-10 mpy	SEVERE >10 mpy
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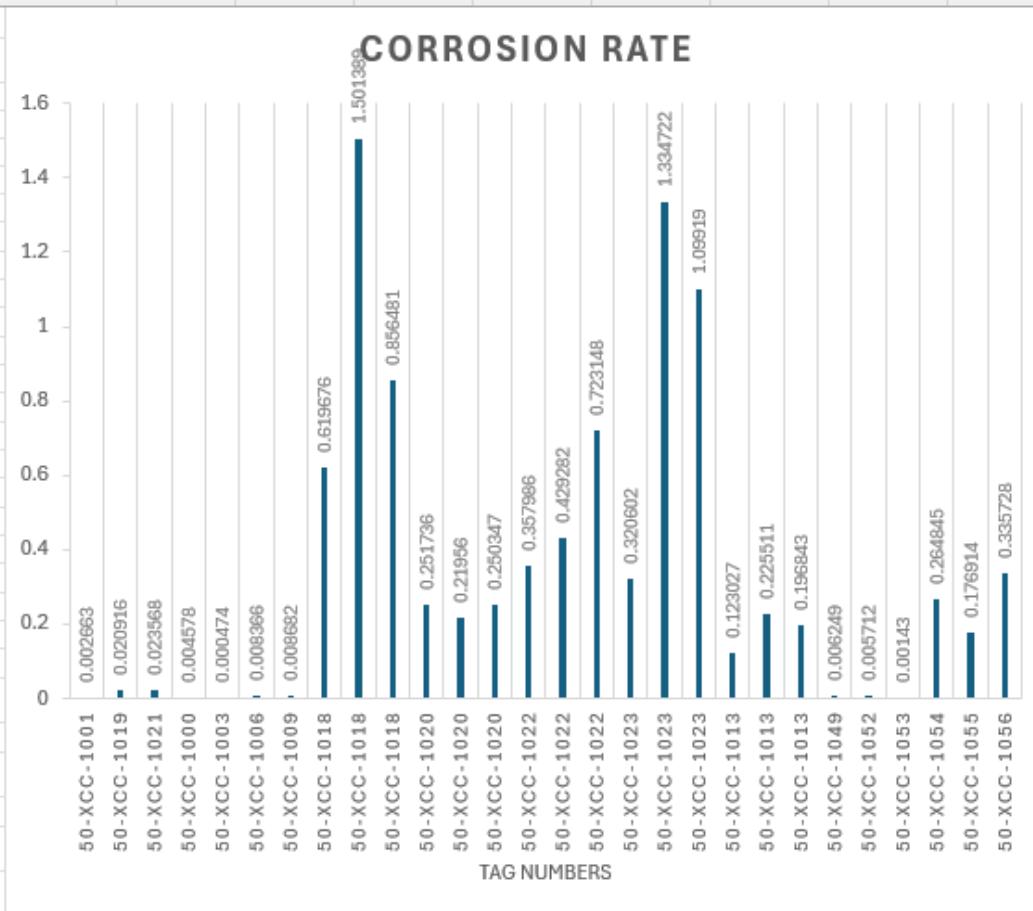
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PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed	CONTRACT REF. NO.:	LC241047A0
SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

TAG NO.	CORROSION RATE
50-XCC-1001	0.002663
50-XCC-1019	0.020916
50-XCC-1021	0.023568
50-XCC-1000	0.004578
50-XCC-1003	0.000474
50-XCC-1006	0.008366
50-XCC-1009	0.008682
50-XCC-1018	0.619676
50-XCC-1018	1.501389
50-XCC-1018	0.856481
50-XCC-1020	0.251736
50-XCC-1020	0.21956
50-XCC-1020	0.250347
50-XCC-1022	0.357986
50-XCC-1022	0.429282
50-XCC-1022	0.723148
50-XCC-1023	0.320602
50-XCC-1023	1.334722
50-XCC-1023	1.09919
50-XCC-1013	0.123027
50-XCC-1013	0.225511
50-XCC-1013	0.196843
50-XCC-1049	0.006249
50-XCC-1052	0.005712
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50-XCC-1054	0.264845
50-XCC-1055	0.176914
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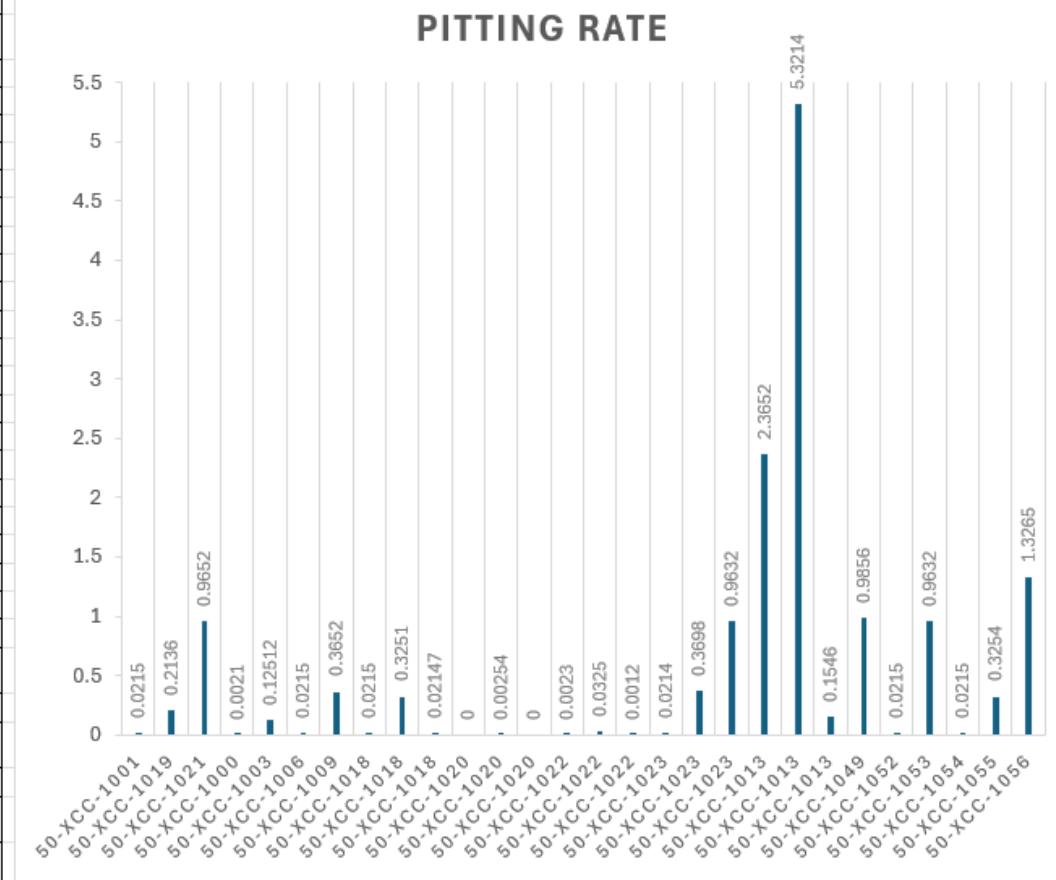
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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

TAG NO.	PITTING RATE
50-XCC-1001	0.0215
50-XCC-1019	0.2136
50-XCC-1021	0.9652
50-XCC-1000	0.0021
50-XCC-1003	0.12512
50-XCC-1006	0.0215
50-XCC-1009	0.3652
50-XCC-1018	0.0215
50-XCC-1018	0.3251
50-XCC-1018	0.02147
50-XCC-1020	0
50-XCC-1020	0.00254
50-XCC-1020	0
50-XCC-1022	0.0023
50-XCC-1022	0.0325
50-XCC-1022	0.0012
50-XCC-1023	0.0214
50-XCC-1023	0.3698
50-XCC-1023	0.9632
50-XCC-1013	2.3652
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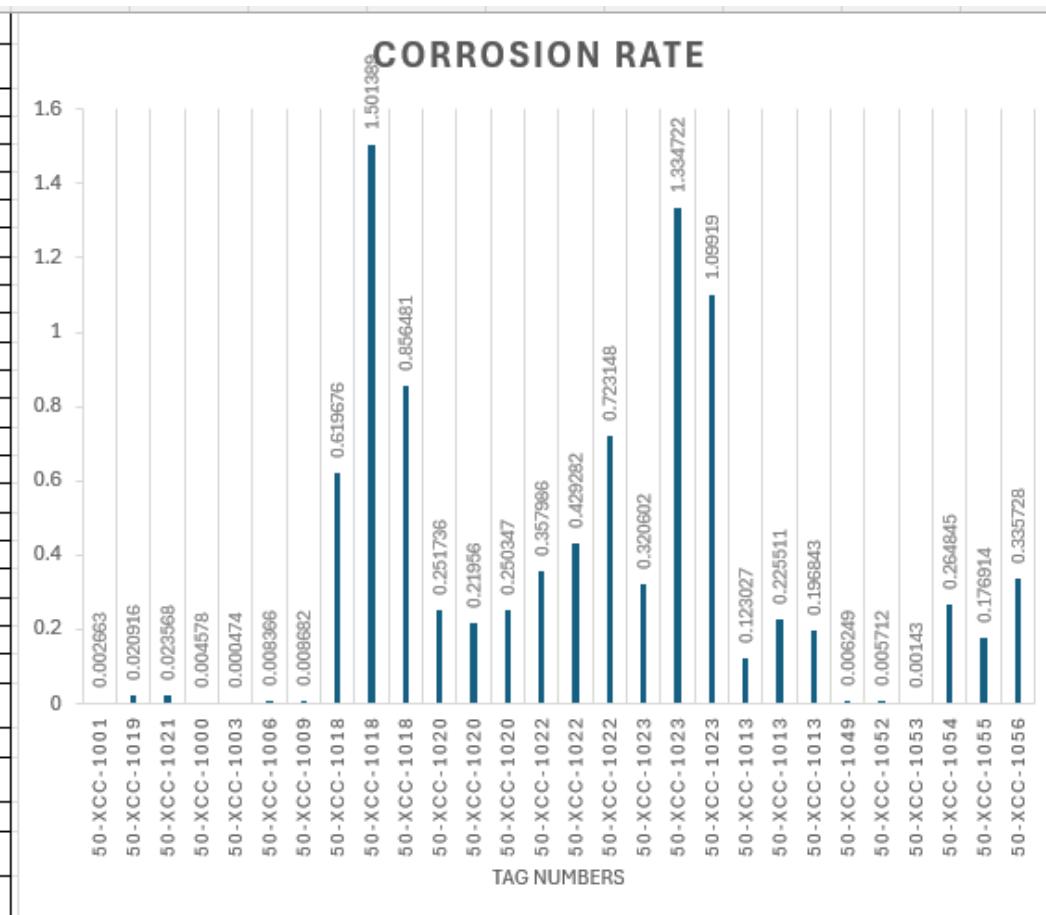
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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

TAG NO.	CORROSION RATE
50-XCC-1001	0.002663
50-XCC-1019	0.020916
50-XCC-1021	0.023568
50-XCC-1000	0.004578
50-XCC-1003	0.000474
50-XCC-1006	0.008366
50-XCC-1009	0.008682
50-XCC-1018	0.619676
50-XCC-1018	1.501389
50-XCC-1018	1.501389
50-XCC-1018	0.856481
50-XCC-1020	0.251736
50-XCC-1020	0.21956
50-XCC-1020	0.250347
50-XCC-1022	0.357986
50-XCC-1022	0.429282
50-XCC-1022	0.723148
50-XCC-1023	0.320602
50-XCC-1023	1.334722
50-XCC-1023	1.09919
50-XCC-1013	0.123027
50-XCC-1013	0.225511
50-XCC-1013	0.196843
50-XCC-1049	0.006249
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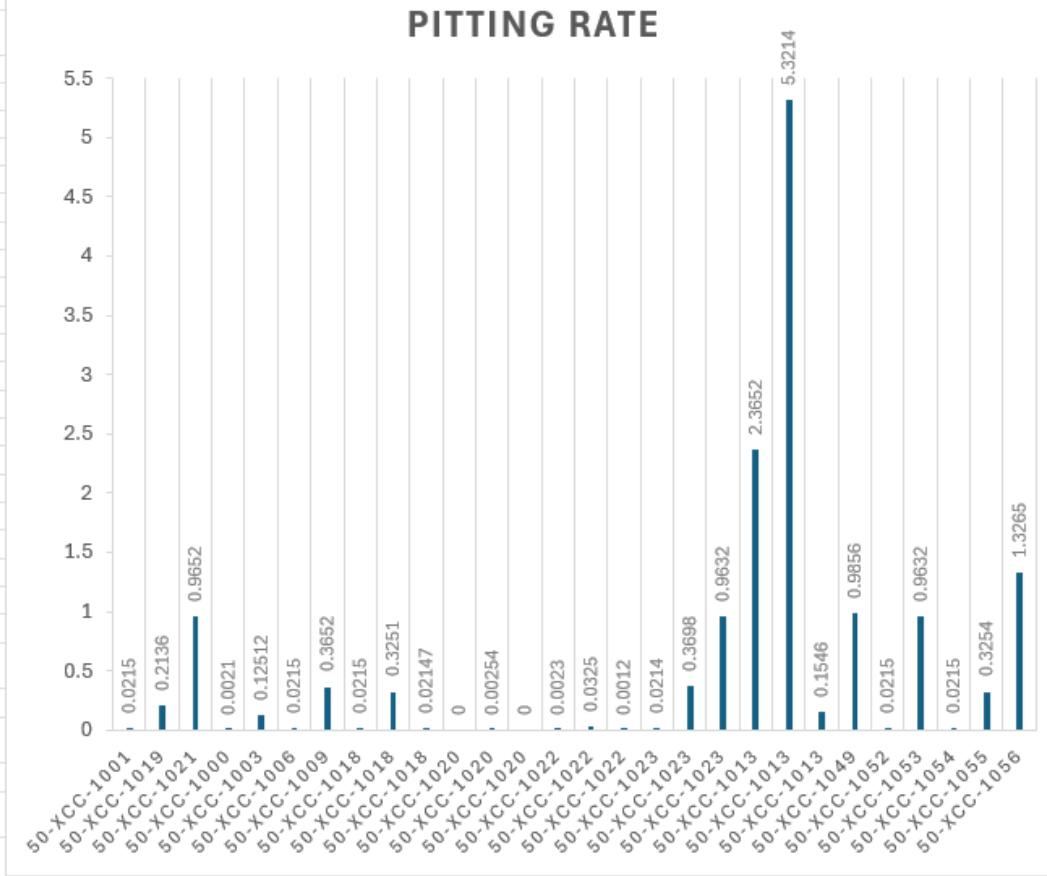
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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

TAG NO.	PITTING RATE
50-XCC-1001	0.0215
50-XCC-1019	0.2136
50-XCC-1021	0.9652
50-XCC-1000	0.0021
50-XCC-1003	0.12512
50-XCC-1006	0.0215
50-XCC-1009	0.3652
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50-XCC-1020	0
50-XCC-1022	0.0023
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50-XCC-1052	0.0215
50-XCC-1053	0.9632
50-XCC-1054	0.0215
50-XCC-1055	0.3254
50-XCC-1056	1.3265



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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Provision of Corrosion Monitoring Services Report at Offshore Location Halul Island 1st Campaign	SUBMISSION DATE:	17-11-25

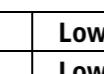
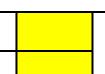
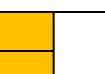
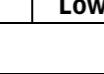
APPENDIX – C

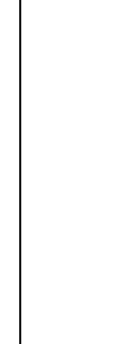
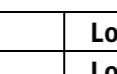
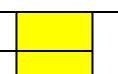
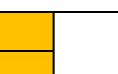
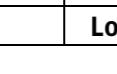
COUPON IMAGES IN HALUL ISLAND

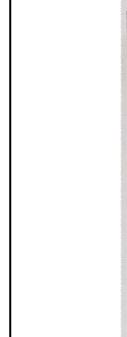
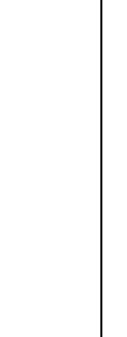
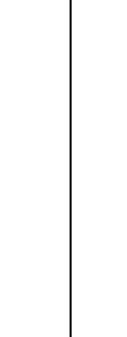
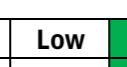
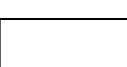
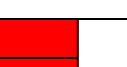
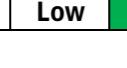
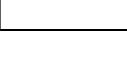
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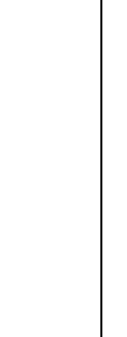
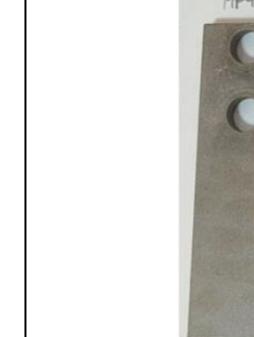
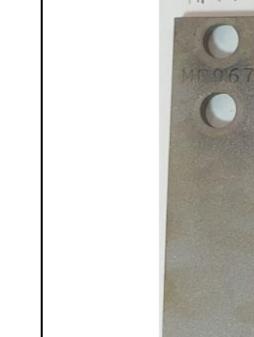
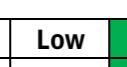
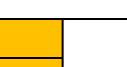
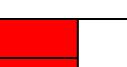
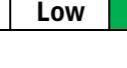
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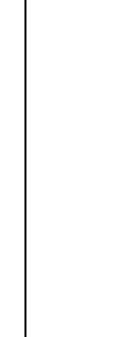
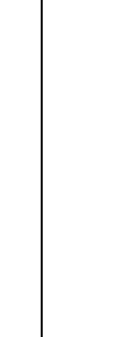
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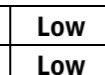
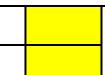
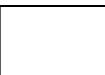
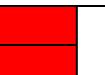
 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0 REV: 1 DATE: 17-11-2025	
	LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS									
	CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES									
Tag No.	50-XCC-1056		Report No.							
RO #	8251014022									
Location:	HALUL API PIT									
Line Identification:	3"-OD-501557									
Line Description:	3" OPEN DRAIN PUMP DISCHARGE									
Process Fluid:	OIL		Access fitting orientation:	TOP MOUNTED 12 O'CLOCK						
Process Pressure:	50 Psi		Coupon holder model / length:	6200-3.25"						
Process Temperature:	N/A		Coupon Type / Position:	3" STRIP / BOTTOM OF THE LINE						
Inhibitor:	N/A		Material:	C 1018						
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)	
13/07/2023	MP965	36.6985	6/7/2025	36.3200	0.01	0.3685	724	0.277328	0.306528	
	MP966	36.8181		36.3620		0.4461				
Coupons Observation During retrieval				Coupon Observation After cleaning						
Coupons are in blackish color with oily layer.				Shallow Pits		Shallow Pits				
Coupon Photos Before cleaning				Coupon Photos After cleaning						
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning			
										
Pitting (if any)										
Deepest measured pit (mils)		2.631								
Calculated Pitting rate (m/y):		1.3265								
Average Corrosion Rate (mpy) is:		Low		0.306528	Moderate		High		Severe	
Maximum Pitting rate (mm/y) is:		Low		1.3265	Moderate		High		Severe	
Remarks:										
PAGE	Prepared By:				Reviewed By:			Approval Stamp:		
18										

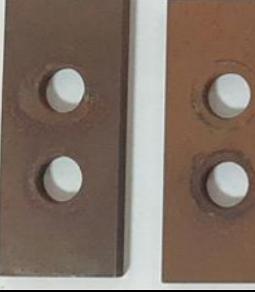
 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0			
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									DATE: 17-11-2025			
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS												
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES												
Tag No.	50-XCC-1055		Report No.									
RO #	8251014022											
Location:	HALUL API PIT											
Line Identification:	4"-OD-501605											
Line Description:	4" OPEN DRAIN TANK DISCHARGE T-50100 A&B											
Process Fluid:	OIL		Access fitting orientation:		TOP MOUNTED 12 O'CLOCK							
Process Pressure:	50 Psi		Coupon holder model / length:		6200-4.25"							
Process Temperature:	N/A		Coupon Type / Position:		3" STRIP / BOTTOM OF THE LINE							
Inhibitor:	N/A		Material:		C 1018							
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)			
13/07/2023	MP991	36.9784	7/7/2025	36.733	0.01	0.2354	725	0.176914	0.17015			
	MP992	36.6834		36.456		0.2174		0.163386				
Coupons Observation During retrieval				Coupon Observation After cleaning								
Coupons are in blackish color with oily layer.				No Corrosion Observed				Shallow pits under Microscope				
Coupon Photos Before cleaning				Coupon Photos After cleaning								
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning					
												
Pitting (if any)												
Deepest measured pit (mils)		0.426										
Calculated Pitting rate (m/y):		0.646										
Average Corrosion Rate (mpy) is:		Low		0.17015	Moderate		High		Severe			
Maximum Pitting rate (mm/y) is:		Low		0.646	Moderate		High		Severe			
Remarks:												
PAGE	Prepared By:				Reviewed By:				Approval Stamp:			
17												

 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0			
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LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS												
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES												
Tag No.	50-XCC-1054		Report No.									
RO #	8251014022											
Location:	HALUL API PIT											
Line Identification:	8"-OD-501543											
Line Description:	8" CLOSE DRAIN HEADER											
Process Fluid:	OIL		Access fitting orientation:		TOP MOUNTED 12 O'CLOCK							
Process Pressure:	50 Psi		Coupon holder model / length:		6200-6.25"							
Process Temperature:	N/A		Coupon Type / Position:		3" STRIP / BOTTOM OF THE LINE							
Inhibitor:	N/A		Material:		C 1018							
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)			
13/07/2023	MP993	36.6124		36.9090	0.01	0.300660	725	0.23042	0.2476325			
	MP994	36.9404		36.5780		0.352400		0.264845				
Coupons Observation During retrieval				Coupon Observation After cleaning								
Coupons are in blackish color with oily layer.				No Corrosion Observed				No Corrosion Observed				
Coupon Photos Before cleaning				Coupon Photos After cleaning								
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning					
												
Pitting (if any)												
Deepest measured pit (mils)		0.043										
Calculated Pitting rate (m/y):		0.0215										
Average Corrosion Rate (mpy) is:		Low		0.2476325	Moderate		High		Severe			
Maximum Pitting rate (mm/y) is:		Low		0.0215	Moderate		High		Severe			
Remarks:												
PAGE	Prepared By:				Reviewed By:				Approval Stamp:			
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 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0		
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									DATE: 17-11-2025		
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS											
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Tag No.	50-XCC-1053		Report No.								
RO #	8251014022										
Location:	HALUL API PIT										
Line Identification:	8"-OD-501548										
Line Description:	8" CLOSE DRAIN PUMP DISCHARGE										
Process Fluid:	OIL		Access fitting orientation:		TOP MOUNTED 12 O'CLOCK						
Process Pressure:	50 Psi		Coupon holder model / length:		6200-6.25"						
Process Temperature:	N/A		Coupon Type / Position:		3" STRIP / BOTTOM OF THE LINE						
Inhibitor:	N/A		Material:		C 1018						
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)		
13/07/2023	MP967	36.9307	6/7/2025	36.9190	0.01	0.00170	724	0.001279	0.0013545		
	MP968	36.8939		36.8820		0.00190					
Coupons Observation During retrieval					Coupon Observation After cleaning						
Coupons are in blackish color with oily layer.					No Corrosion Observed					Shallow Scattered Pits	
Coupon Photos Before cleaning					Coupon Photos After cleaning						
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning				
											
Pitting (if any)											
Deepest measured pit (mils)		1.911									
Calculated Pitting rate (m/y):		0.9632									
Average Corrosion Rate (mpy) is:		Low		0.0013545	Moderate		High		Severe		
Maximum Pitting rate (mm/y) is:		Low		0.9632	Moderate		High		Severe		
Remarks:											
PAGE	Prepared By:				Reviewed By:				Approval Stamp:		
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 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0		
									REV: 1		
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LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS											
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES											
Tag No.	50-XCC-1052		Report No.								
RO #	8251014022										
Location:	HALUL API PIT										
Line Identification:	10"-OD-501561										
Line Description:	10" DISCHARGE OF CLOSE DRAIN VESSEL V-5097 A&B										
Process Fluid:	OIL		Access fitting orientation:		TOP MOUNTED 12 O'CLOCK						
Process Pressure:	50 Psi		Coupon holder model / length:		6200-7.25"						
Process Temperature:	N/A		Coupon Type / Position:		3" STRIP / BOTTOM OF THE LINE						
Inhibitor:	N/A		Material:		C 1018						
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)		
13/07/2023	MP969	36.9175	7/7/2025	36.9000	0.01	0.00750	725	0.005637	0.0056745		
	MP970	36.8386		36.8210		0.00760		0.005712			
Coupons Observation During retrieval				Coupon Observation After cleaning							
Coupons are in blackish color with oily layer.											
Coupon Photos Before cleaning				Coupon Photos After cleaning							
				No Corrosion Observed			No Corrosion Observed				
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning				
											
Pitting (if any)											
Deepest measured pit (mils)		0.043									
Calculated Pitting rate (m/y):		0.0215									
Average Corrosion Rate (mpy) is:		Low		0.0056745	Moderate		High		Severe		
Maximum Pitting rate (mm/y) is:		Low		0.0215	Moderate		High		Severe		
Remarks:											
PAGE	Prepared By:				Reviewed By:				Approval Stamp:		
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  	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF.	LC241047A0					
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									DATE:	17-11-2025					
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS															
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES															
Tag No.	50-XCC-1049			Report No.											
RO #	8251014022														
Location:	HALUL-OLD METERING AREA														
Line Identification:	20"-OC-500573														
Line Description:	20" OXY TIE-UP LINE														
Process Fluid:	OIL			Access fitting orientation:		TOP MOUNTED 12 O'CLOCK									
Process Pressure:	100 Psi			Coupon holder model / length:		6200-20.25"									
Process Temperature:	N/A			Coupon Type / Position:		3" STRIP / BOTTOM OF THE LINE									
Inhibitor:	N/A			Material:		C 1018									
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)						
14/07/2023	MP995	36.7222	28/06/2025	36.7040	0.01	0.00820	715	0.006249	0.00362						
	MP996	36.8173		36.8060		0.00130		0.000991							
Coupons Observation During retrieval				Coupon Observation After cleaning											
Coupons are in blackish color with oily layer.															
Coupon Photos Before cleaning				Coupon Photos After cleaning											
Front Before Cleaning		Back Before Cleaning		Front Before Cleaning		Back Before Cleaning		Front After Cleaning		Back After Cleaning		Front After Cleaning		Back After Cleaning	
															
Pitting (if any)															
Deepest measured pit (mils)		1.931													
Calculated Pitting rate (m/y):		0.9856													
Average Corrosion Rate (mpy) is:		Low		0.00362	Moderate		High		Severe						
Maximum Pitting rate (mm/y) is:		Low		0.9856	Moderate		High		Severe						
Remarks:															
PAGE	Prepared By:					Reviewed By:					Approval Stamp:				
13															

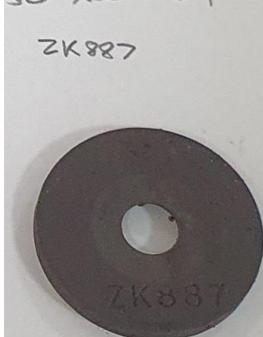
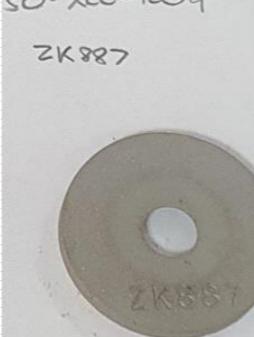
 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0			
									REV: 1			
									DATE: 17-11-2025			
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS												
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES												
Tag No.	50-XCC-1013		Report No.									
RO #	8251014022											
Location:	HALUL SOUTH TANK FARMS											
Line Identification:												
Line Description:	TANK SHELL STF 5003											
Process Fluid:			Access fitting orientation:		MOUNTED IN TANK SHELL							
Process Pressure:			Coupon holder model / length:		6204-27.00"							
Process Temperature:			Coupon Type / Position:		2" LADDER							
Inhibitor:			Material:		C 1018							
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)			
12/7/2023	AE307	24.7515	29/06/2025	24.6430	0.01	0.10850	718	0.114322	0.145698			
	AE308	24.591		24.4750		0.11600						
	AE309	24.9823		24.7780		0.20430						
	AE310	24.7228		24.5580		0.16480						
	AE311	24.8456		24.6660		0.17960						
	AE312	24.6150		24.6150		0.03000						
Coupons Observation During retrieval				Coupon Observation After cleaning								
Coupons are in blackish color with full thick sludge deposit covered with holder and coupons				General Corrosion Observed				Scattered Pits				
Coupon Photos Before cleaning				Coupon Photos After cleaning								
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning					
												
Pitting (if any)												
Deepest measured pit (mils)		10.468										
Calculated Pitting rate (m/y):		5.3214										
Average Corrosion Rate (mpy) is:		Low		0.145698	Moderate		High		Severe			
Maximum Pitting rate (mm/y) is:		Low			Moderate		5.3214	High		Severe		
Remarks:												
PAGE	Prepared By:				Reviewed By:				Approval Stamp:			
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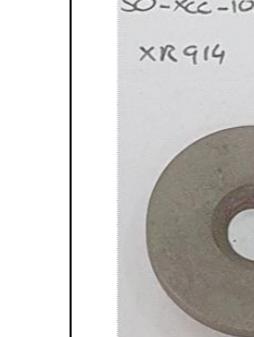
  <p>petromec ABDULLA FOUAD IMPALLOY LTD. CO.</p>  <p>QatarEnergy</p>		PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF.	LC241047A0			
								REV:	1					
								DATE:	17-11-2025					
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS														
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES														
Tag No.	50-XCC-1023		Report No.											
RO #	8251014022													
Location:	HALUL CENTRAL MANIFOLD													
Line Identification:														
Line Description:	TANK SHELL NTF 5051													
Process Fluid:			Access fitting orientation:		MOUNTED IN TANK SHELL									
Process Pressure:			Coupon holder model / length:		6204-27.00"									
Process Temperature:			Coupon Type / Position:		2" LADDER									
Inhibitor:			Material:		C 1018									
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)					
12/7/2023	AE353	24.7642	1/7/2025	24.6090	0.01	0.14520	720	0.168056	0.6745965					
	AE354	24.622		24.3350		0.27700								
	AE355	24.6429		24.1820		0.40590								
	AE356	24.5412		23.3780		1.15320								
	ZK848	24.6497		23.6900		0.94970								
	ZK849	24.6941		24.1630		0.52110								
Coupons Observation During retrieval				Coupon Observation After cleaning										
Coupons are in blackish color with hard scale deposit observed.				Shallow General Corrosion				Shallow General Corrosion						
Coupon Photos Before cleaning				Coupon Photos After cleaning										
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning							
														
Pitting (if any)														
Deepest measured pit (mils)		1.9												
Calculated Pitting rate (m/y):		0.9632												
Average Corrosion Rate (mpy) is:		Low		0.6745965	Moderate		High		Severe					
Maximum Pitting rate (mm/y) is:		Low		0.9632	Moderate		High		Severe					
Remarks:														
PAGE	Prepared By:				Reviewed By:				Approval Stamp:					
11														

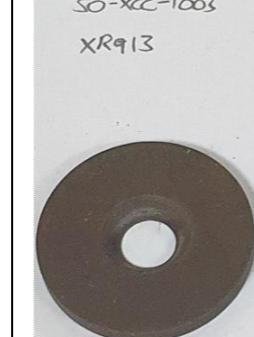
 AFIC <small>ABDULLA FOUAD IMPALLOY LTD. CO.</small> 		PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF.	LC241047A0		
								REV:	1				
								DATE:	17-11-2025				
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS													
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES													
Tag No.	50-XCC-1022		Report No.										
RO #	8251014022												
Location:	HALUL CENTRAL MANIFOLD												
Line Identification:													
Line Description:	TANK SHELL NTF 5050												
Process Fluid:			Access fitting orientation:			MOUNTED IN TANK SHELL							
Process Pressure:			Coupon holder model / length:			6204-27.00"							
Process Temperature:			Coupon Type / Position:			2" LADDER							
Inhibitor:			Material:			C 1018							
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)				
12/7/2023	AE297	24.7223	1/7/2025	24.4030	0.01	0.30930	720	0.357986	0.484587				
	AE386	24.5209		24.2210		0.28990							
	VL816	24.4769		24.0960		0.37090							
	VL819	25.1594		24.7890		0.36040							
	XX157	24.4688		23.9020		0.55680							
	VL887	24.8438		24.2090		0.62480							
Coupons Observation During retrieval				Coupon Observation After cleaning									
Coupons are in blackish color with hard scale deposit observed.				Shallow General Corrosion				Shallow General Corrosion					
Coupon Photos Before cleaning				Coupon Photos After cleaning									
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning						
													
Pitting (if any)													
Deepest measured pit (mils)		0.064											
Calculated Pitting rate (m/y):		0.0325											
Average Corrosion Rate (mpy) is:		Low		0.484587	Moderate		High		Severe				
Maximum Pitting rate (mm/y) is:		Low		0.0325	Moderate		High		Severe				
Remarks:													
PAGE	Prepared By:				Reviewed By:				Approval Stamp:				
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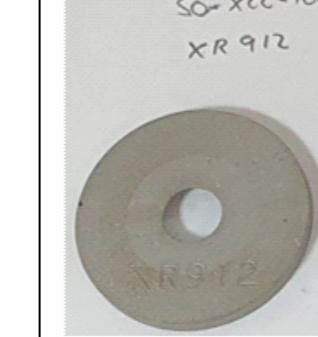
  <p>petromec ABDULLA FOUAD IMPALLOY LTD. CO.</p>  <p>QatarEnergy</p>		PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN							RFQ/TENDER REF.	LC241047A0
							REV:	1		
							DATE:	17-11-2025		
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS										
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES										
Tag No.	50-XCC-1020		Report No.							
RO #	8251014022									
Location:	HALUL CENTRAL MANIFOLD									
Line Identification:										
Line Description:	TANK SHELL NTF 5009									
Process Fluid:			Access fitting orientation:	MOUNTED IN TANK SHELL						
Process Pressure:			Coupon holder model / length:	6204-27.00"						
Process Temperature:			Coupon Type / Position:	2" LADDER						
Inhibitor:			Material:	C 1018						
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)	
11/7/2023	AE374	24.8356	30/06/2025	24.6210	0.01	0.20460	720	0.236806	0.226041667	
	AE375	24.7985		24.5710		0.21750				
	AE376	24.4744		24.2820		0.18240				
	AE377	24.6507		24.4510		0.18970				
	AE378	24.4493		24.2780		0.16130				
	AE379	24.8843		24.6580		0.21630				
Coupons Observation During retrieval				Coupon Observation After cleaning						
Coupons are in blackish color with mild scale deposit observed.				General Corrosion Observed			General Corrosion Observed			
Coupon Photos Before cleaning				Coupon Photos After cleaning						
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning			
										
Pitting (if any)										
Deepest measured pit (mils)		0.005								
Calculated Pitting rate (m/y):		0.002								
Average Corrosion Rate (mpy) is:		Low		0.22604167	Moderate		High		Severe	
Maximum Pitting rate (mm/y) is:		Low		0.002	Moderate		High		Severe	
Remarks:										
PAGE	Prepared By:			Reviewed By:				Approval Stamp:		
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  <p>petromec ABDULLA FOUD IMPALLOY LTD. CO.</p>  <p>QatarEnergy</p>		PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF.	LC241047A0
								REV:	1		
								DATE:	17-11-2025		
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS											
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES											
Tag No.	50-XCC-1018		Report No.								
RO #	8251014022										
Location:	HALUL API PIT										
Line Identification:											
Line Description:	TANK SHELL NTF 5007										
Process Fluid:			Access fitting orientation:		MOUNTED IN TANK SHELL						
Process Pressure:			Coupon holder model / length:		6200-275"						
Process Temperature:			Coupon Type / Position:		2" LADDER						
Inhibitor:			Material:		C 1018						
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)		
11/7/2023	VC933	24.9584	30/06/2025	24.7500	0.01	0.1984	720	0.229630	0.654224667		
	VC934	24.9074		24.3620		0.5354					
	VC931	24.5952		23.2880		1.2972					
	VC932	24.6637		24.2560		0.3977					
	AE372	24.7350		24.5130		0.2120					
	AE373	25.0800		24.3300		0.7400					
Coupons Observation During retrieval				Coupon Observation After cleaning							
				General Corrosion and Scattered Pits Noticed			General Corrosion and Scattered Pits Noticed				
Coupon Photos Before cleaning				Coupon Photos After cleaning							
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning				
											
Pitting (if any)											
Deepest measured pit (mils)	0.641										
Calculated Pitting rate (m/y):	0.3251										
Average Corrosion Rate (mpy) is:	Low		0.65422467	Moderate		High		Severe			
Maximum Pitting rate (mm/y) is:	Low		0.3251	Moderate		High		Severe			
Remarks:											
PAGE	Prepared BY:				Reviewed By:			Approval Stamp:			
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 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0				
									REV: 1				
									DATE: 17-11-2025				
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS													
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES													
Tag No.	50-XCC-1009		Report No.										
RO #	8251014022												
Location:	HALUL-TANK HEADER CENTRAL MANIFOLD												
Line Identification:	NOT AVAILABLE												
Line Description:	36" LINE TO TANK HEADER MANIFOLD T-5001												
Process Fluid:	CRUDE OIL		Access fitting orientation:		BOTTOM MOUNTED 6 O'CLOCK								
Process Pressure:	100 Psi		Coupon holder model / length:		6202-3.00"								
Process Temperature:	N/A		Coupon Type / Position:		FLUSH DISC / BOTTOM OF THE LINE								
Inhibitor:	N/A		Material:		C 1018								
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)				
10/7/2023	ZK887	17.3745	27/06/2025	17.3590	0.01	0.0055	718	0.008682	0.004341				
Coupons Observation During retrieval					Coupon Observation After cleaning								
Retrieved coupon found in blackish color with hard scale deposit observed.					Very Low General Corrosion								
Coupon Photos Before cleaning					Coupon Photos After cleaning								
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning						
													
Pitting (if any)													
Deepest measured pit (mils)		0.718											
Calculated Pitting rate (m/y):		0.365											
Average Corrosion Rate (mpy) is:		Low		0.004341	Moderate			High			Severe		
Maximum Pitting rate (mm/y) is:		Low		0.3652	Moderate			High			Severe		
Remarks:													
PAGE	Prepared BY:				Reviewed By:				Approval Stamp:				
7													

 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0				
									REV: 1				
									DATE: 17-11-2025				
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS													
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES													
Tag No.	50-XCC-1006		Report No.										
RO #	8251014022												
Location:	HALUL-TANK HEADER CENTRAL MANIFOLD												
Line Identification:	NOT AVAILABLE												
Line Description:	36" LINE TO TANK HEADER MANIFOLD T-5003												
Process Fluid:	CRUDE OIL		Access fitting orientation:		BOTTOM MOUNTED 6 O'CLOCK								
Process Pressure:	50 Psi		Coupon holder model / length:		6202-3.00"								
Process Temperature:	N/A		Coupon Type / Position:		FLUSH DISC / BOTTOM OF THE LINE								
Inhibitor:	N/A		Material:		C 1018								
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)				
10/7/2023	XR914	17.3737	27/06/2025	17.3690	0.01	0.00530	718	0.008366	0.004183				
Coupons Observation During retrieval					Coupon Observation After cleaning								
Retrieved coupon found in blackish color with hard scale deposit observed.					Coupon Corrosion in Good Condition								
Coupon Photos Before cleaning					Coupon Photos After cleaning								
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning						
													
Pitting (if any)													
Deepest measured pit (mils)		0.042											
Calculated Pitting rate (m/y):		0.0215											
Average Corrosion Rate (mpy) is:		Low		0.004183	Moderate			High			Severe		
Maximum Pitting rate (mm/y) is:		Low		0.0215	Moderate			High			Severe		
Remarks:													
PAGE	Prepared BY:				Reviewed By:					Approval Stamp:			
6													

 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0			
									REV: 1			
									DATE: 17-11-2025			
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS												
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES												
Tag No.	50-XCC-1003		Report No.									
RO #	8251014022											
Location:	HALUL-TANK HEADER CENTRAL MANIFOLD											
Line Identification:	NOT AVAILABLE											
Line Description:	36" LINE TO TANK HEADER MANIFOLD T-5004											
Process Fluid:	CRUDE OIL		Access fitting orientation:		BOTTOM MOUNTED 6 O'CLOCK							
Process Pressure:	50 Psi		Coupon holder model / length:		6202-3.00"							
Process Temperature:	N/A		Coupon Type / Position:		FLUSH DISC / BOTTOM OF THE LINE							
Inhibitor:	N/A		Material:		C 1018							
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)			
10/7/2023	XR913	17.3657	27/06/2025	17.356	0.01	0.00030	718	0.000474	0.000474			
Coupons Observation During retrieval					Coupon Observation After cleaning							
Retrieved coupon found in blackish color with minor hard scale deposit observed.					Shallow Scattered Pits Noticed							
Coupon Photos Before cleaning					Coupon Photos After cleaning							
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning					
												
Pitting (if any)												
Deepest measured pit (mils)		0.246										
Calculated Pitting rate (m/y):		0.12512										
Average Corrosion Rate (mpy) is:		Low		0.000474	Moderate		High		Severe			
Maximum Pitting rate (mm/y) is:		Low		0.12512	Moderate		High		Severe			
Remarks:												
PAGE	Prepared BY:				Reviewed By:				Approval Stamp:			
5												

 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0				
									REV: 1				
									DATE: 17-11-2025				
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS													
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES													
Tag No.	50-XCC-1000		Report No.										
RO #	8251014022												
Location:	HALUL-TANK HEADER CENTRAL MANIFOLD												
Line Identification:	NOT AVAILABLE												
Line Description:	36" LINE TO TANK HEADER MANIFOLD T-5002												
Process Fluid:	CRUDE OIL		Access fitting orientation:		BOTTOM MOUNTED 6 O'CLOCK								
Process Pressure:	100 Psi		Coupon holder model / length:		6202-3.00"								
Process Temperature:	N/A		Coupon Type / Position:		FLUSH DISC / BOTTOM OF THE LINE								
Inhibitor:	N/A		Material:		C 1018								
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)				
10/7/2023	XR912	17.4521	27/06/2025	17.445	0.01	0.00290	718	0.004578	0.004578				
Coupons Observation During retrieval					Coupon Observation After cleaning								
Retrieved coupon found in blackish color with hard scale deposit observed.					Both CC are in Good Condition								
Coupon Photos Before cleaning					Coupon Photos After cleaning								
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning						
													
Pitting (if any)													
Deepest measured pit (mils)		0.004											
Calculated Pitting rate (m/y):		0.0021											
Average Corrosion Rate (mpy) is:		Low		0.004578	Moderate			High			Severe		
Maximum Pitting rate (mm/y) is:		Low		0.0021	Moderate			High			Severe		
Remarks:													
PAGE	Prepared BY:				Reviewed By:				Approval Stamp:				
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PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed

RFO/TENDER REF. LC241047A0

SCOPE: Corrosion Monitoring Services

REV: 1

DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN

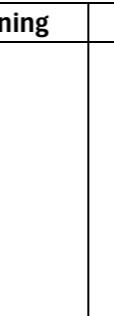
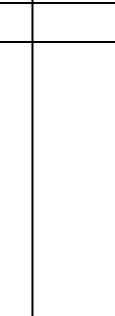
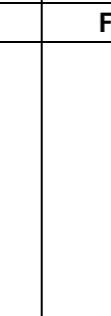
DATE: 17-11-2025

LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS OE LOCATIONS

CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES

Tag No.	50-XCC-1021	Report No.							
RO #	8251014022								
Location:	HALUL-NPG UNIT								
Line Identification:	6"-GF-503305-9144								
Line Description:	6" GAS FUEL INLET TO NEW SLUDGE GATHER V-5066 (3RD A/F LOCATION BOTTOM STREAM COUPON)								
Process Fluid:	GAS	Access fitting orientation:	FLANGED A/F-TOP MOUNTED 12 O'CLOCK						
Process Pressure:	150 Psi	Coupon holder model / length:	6200-10.50"						
Process Temperature:	N/A	Coupon Type / Posision:	3" STRIP / TOP OF THE LINE						
Inhibitor:	N/A	Material:	C 1018						
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Avarage Corrosion Rate (mpy)
11/7/2025	MP963	36.7751	29/06/2025	36.734	0.01	0.0311	719	0.023568	0.020423
	MP964	36.7428		36.71		0.0228		0.017278	

Coupons Observation During retrieval

Coupon are in blakish color with no deposit observed				No General Corrosion Observed. Shallow Pits Noticed		No General Corrosion Observed. Shallow Pits Noticed	
<u>Coupon Photos Before cleaning</u>				<u>Coupon Photos After cleaning</u>			
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning
							

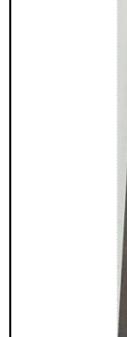
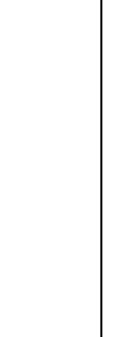
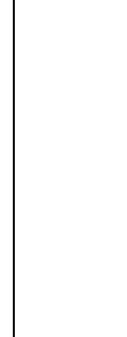
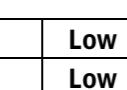
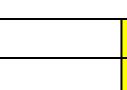
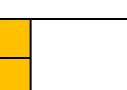
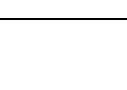
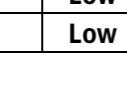
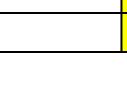
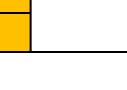
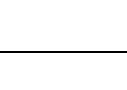
Pitting (if any)

Deepest measured pit (mils)	1.9101
Calculated Pitting rate (m/y):	0.09652

Average Corrosion Rate (mpy) is:	Low		0.020423	Moderate			High			Severe	
Maximum Pitting rate (mm/y) is:	Low		0.09652	Moderate			High			Severe	

Remarks:

PAGE	Prepared BY:	Reviewed By:	Approval Stamp:
3			

 AFIC <small>ABDULLA FOUD IMPALLOY LTD. CO.</small> 	PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed SCOPE: Corrosion Monitoring Services DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN								RFQ/TENDER REF. LC241047A0				
									REV: 1				
									DATE: 17-11-2025				
LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS													
CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES													
Tag No.	50-XCC-1019		Report No.										
RO #	8251014022												
Location:	HALUL-NPG UNIT												
Line Identification:	6"-GF-503305-9144												
Line Description:	6" GAS FUEL INLET TO NEW SLUDGE GATHER V-5066 (1ST A/F LOCATION BOTTOM STREAM COUPON)												
Process Fluid:	GAS		Access fitting orientation:		FLANGED A/F-TOP MOUNTED 12 O'CLOCK								
Process Pressure:	150 Psi		Coupon holder model / length:		6200-12.25"								
Process Temperature:	N/A		Coupon Type / Position:		3" STRIP / B.O.L								
Inhibitor:	N/A		Material:		C 1018								
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)				
11/7/2023	MP961	35.9636	29/06/2025	36.9260	0.01	0.03760	719	0.020916	0.017013				
	MP962	36.6323		36.6050		0.02730		0.01311					
Coupons Observation During retrieval				Coupon Observation After cleaning									
Coupon are in blakish color with no deposit observed				CC in Good Conditions. Shallow Pitting Corrosion Observed				CC in Good Conditions. Shallow Pitting Corrosion Observed					
Coupon Photos Before cleaning				Coupon Photos After cleaning									
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning						
													
Pitting (if any)													
Deepest measured pit (mils)		0.421											
Calculated Pitting rate (m/y):		0.2136											
Average Corrosion Rate (mpy) is:		Low		0.017013	Moderate			High			Severe		
Maximum Pitting rate (mm/y) is:		Low		0.2136	Moderate			High			Severe		
Remarks:													
PAGE	Prepared BY:				Reviewed By:				Approval Stamp:				
2													



PROJECT NAME: Provision of Corrosion Monitoring Services at Offshore and Mesaieed

RFQ/TENDER REF. LC241047A0

SCOPE: Corrosion Monitoring Services

REV: 1

DOCUMENT: PROVISION OF CORROSION MONITORING SERVICES REPORT AT OFFSHORE LOCATION HALUL ISLAND 1ST CAMPAIGN

DATE: 17-11-2025

LC241047A0-PROVISION OF CORROSION MONITORING SERVICES AT VARIOUS QE LOCATIONS

CORROSION COUPONS ANALYSIS REPORT - COUPON IMAGES

Tag No.	50-XCC-1001		Report No.											
RO #	8251014022													
Location:	HALUL MOL													
Line Identification:	16"-OC-500663-61XXX													
Line Description:	16" CRUDE OIL COMING FROM PS-3 STATION AFTER TIE-UP 14"-OC500668-31441M													
Process Fluid:	OIL		Access fitting orientation:		TOP MOUNTED (12 O'CLOCK)									
Process Pressure:	100 Psi		Coupon holder model / length:		620005-14.75"									
Process Temperature:	N/A		Coupon Type / Position:		3" STRIP / B.O.L									
Inhibitor:	N/A		Material:		CARBON STEEL									
Date Installed	Coupon No	Initial weight (gm)	Date Removed	Final weight (gm)	Blank loss (gm)	Net loss (gm)	Exposure Days	Individual Coupons Corrosion Rate (mpy)	Average Corrosion Rate (mpy)					
14/7/2023	MP997	36.6825	29/6/2025	36.6760	0.01	0.00350	716	0.002663	0.002321					
	MP998	37.6824		37.6760		0.00260								
Coupons Observation During retrieval					Coupon Observation After cleaning									
Coupons are in blackish color oily layer					Both CC in Good Condition & No Corrosion Observed									
Coupon Photos Before cleaning					Coupon Photos After cleaning									
Front Before Cleaning	Back Before Cleaning	Front Before Cleaning	Back Before Cleaning	Front After Cleaning	Back After Cleaning	Front After Cleaning	Back After Cleaning							
Pitting (if any)														
Deepest measured pit (mils)		0.046												
Calculated Pitting rate (m/y):		0.042												
Average Corrosion Rate (mpy) is:	Low		0.002321	Moderate			High			Severe				
Maximum Pitting rate (mm/y) is:	Low		0.042	Moderate		High			Severe					
Remarks:														
PAGE	Prepared BY:				Reviewed By:				Approval Stamp:					
1														

PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed	CONTRACT REF. NO.:	LC241047AO
SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

APPENDIX – D

CORROSION COUPON ANALYSIS DATASHEET IN HALUL ISLAND

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

HALUL ISLAND					
COMPARISON BETWEEN CORROSION RATE DATA BETWEEN 2023 & 2025 SURVEYS					
S. No.	Tag No	Line description	2023 Individual Coupons Corrosion Rate (mpy)	2025 Individual Coupons Corrosion Rate (mpy)	Remarks
Location: Halul MOL					
1	50-XCC-1001	16"-OC-500663-61XXX 16" Crude oil coming from PS-3 Station After tie-up 14"-OC-500668-31441M	0.832	0.003	
			0.949	0.002	
Location: Halul-NPG Unit					
2	50-XCC-1019	6-GF-503305-9144 6" Gas fuel inlet to new sludge gather V-5066 (1st A/F location bottom stream	0.897	0.013	
3	50-XCC-1021	6-GF-503305-9144 6" Gas fuel inlet to new sludge gather V-5066 (3rd A/F location top stream	1.003	0.024	
			0.851	0.017	
Location: Halul-Tank Header Central Manifold					
4	50-XCC-1000	Line No.: Not available 36" Line to Tank Header manifold T-5002	1.861	0.005	
5	50-XCC-1003	Line No.: Not available 36" Line to Tank Header manifold T-5004	1.868	0.000	
6	50-XCC-1006	Line No.: Not available 36" Line to Tank Header manifold T-5003	1.835	0.008	
7	50-XCC-1009	Line No.: Not available 36" Line to Tank Header manifold T-5001	1.470	0.009	
Location: Halul North Tank Farm					
			N/A	0.0037	Not surveyed during 2023 due to Tanks Shutdown
			N/A	0.00989	
			N/A	0.02396	
8	50-XCC-1018	Mounted in Tank Shell	N/A	0.0073	
			N/A	0.00391	
			N/A	0.01367	
	50-XCC-1020	Tank Shell NTF 5009	2.202	0.004	
			4.006	0.004	
9			1.625	0.003	
			2.889	0.004	
			2.446	0.003	

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

10	50-XCC-1022	Tank Shell NTF 5050	2.821	0.004	
			2.795	0.006	
			2.322	0.005	
			3.065	0.007	
			3.663	0.007	
			4.884	0.010	
			5.235	0.012	
11	50-XCC-1023	Tank Shell NTF 5051	4.073	0.003	
			2.448	0.005	
			5.454	0.008	
			3.483	0.021	
			6.098	0.018	
			3.030	0.010	

Location: Halul South Tank Farm

12	50-XCC-1013	Tank Shell STF 5003	2.355	0.114	
			2.513	0.123	
			2.585	0.226	
			2.468	0.180	
			2.465	0.197	
			2.614	0.035	

Location: Old Metering Area

13	50-XCC-1049	20"-OC-500573	0.173	0.006	
		20" Oxy Tie-up line	0.119	0.001	

Location: Halul API Pit

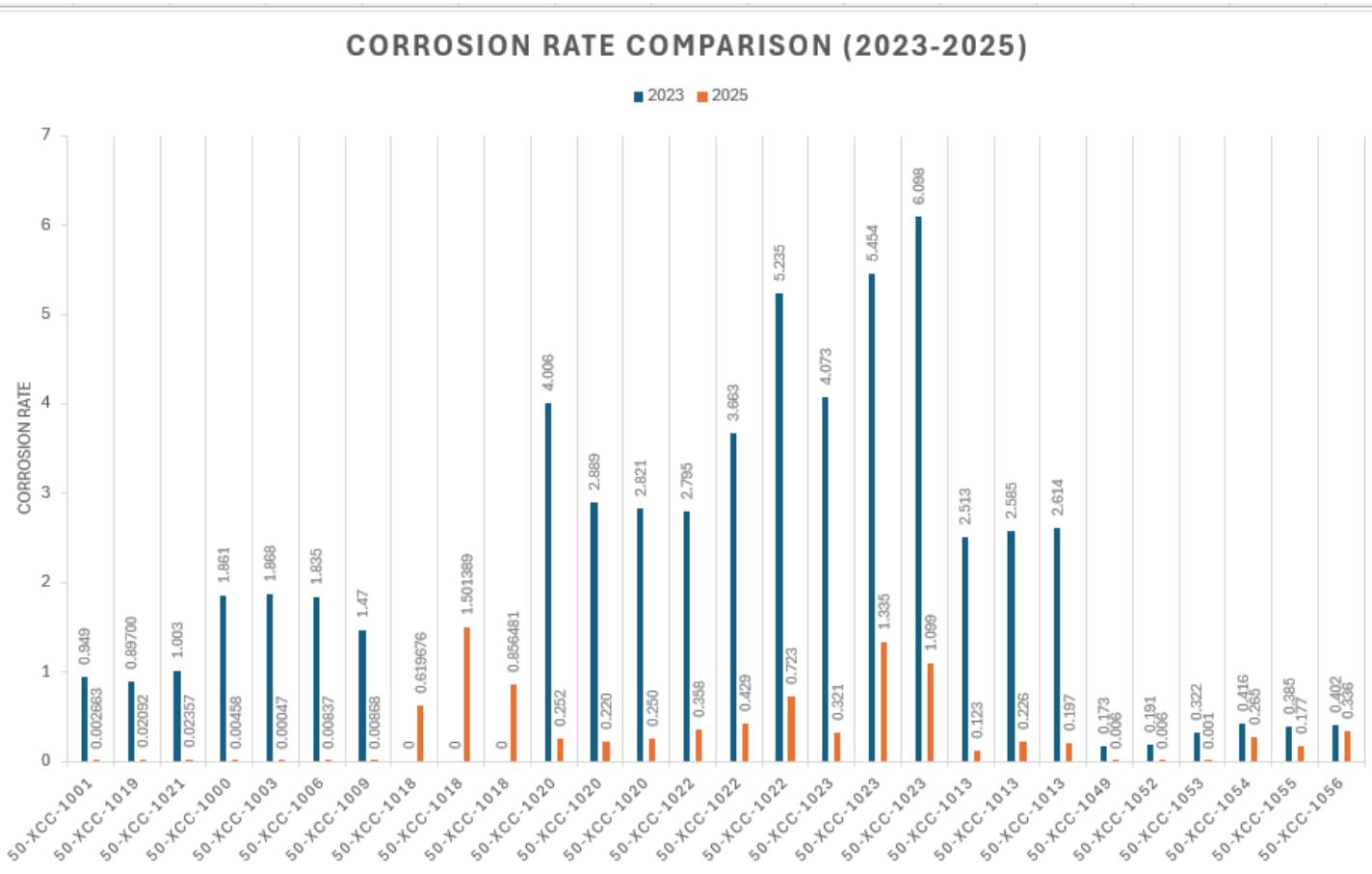
14	50-XCC-1052	10"-OD-501561 10" Discharge of close drain vessel V-5097 A&B	0.191	0.006	
			0.161	0.006	
15	50-XCC-1053	8"-OD-501548 8" Close drain pump discharge	0.322	0.001	
			0.226	0.001	
16	50-XCC-1054	8"-OD-501543 8" Close drain header	0.416	0.230	
			0.358	0.265	
17	50-XCC-1055	4"-OD-501605 4" Open drain tank discharge T-50100 A&B	0.385	0.177	
			0.265	0.163	
18	50-XCC-1056	3"-OD-501557 3" Open drain pump discharge	0.366	0.277	
			0.402	0.336	

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

TAG NO.:	2023	2025
50-XCC-1001	0.949	0.002663
50-XCC-1019	0.89700	0.02092
50-XCC-1021	1.003	0.02357
50-XCC-1000	1.861	0.00458
50-XCC-1003	1.868	0.00047
50-XCC-1006	1.835	0.00837
50-XCC-1009	1.47	0.00868
50-XCC-1018	-	0.619676
50-XCC-1018	-	1.501389
50-XCC-1018	-	0.856481
50-XCC-1020	4.006	0.252
50-XCC-1020	2.889	0.220
50-XCC-1020	2.821	0.250
50-XCC-1022	2.795	0.358
50-XCC-1022	3.663	0.429
50-XCC-1022	5.235	0.723
50-XCC-1023	4.073	0.321
50-XCC-1023	5.454	1.335
50-XCC-1023	6.098	1.099
50-XCC-1013	2.513	0.123
50-XCC-1013	2.585	0.226
50-XCC-1013	2.614	0.197
50-XCC-1049	0.173	0.006
50-XCC-1052	0.191	0.006
50-XCC-1053	0.322	0.001
50-XCC-1054	0.416	0.265
50-XCC-1055	0.385	0.177
50-XCC-1056	0.402	0.336



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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

APPENDIX – E

NEW INSTALLED COUPONS DATA IN HALUL ISLAND

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

Locations Details													
S. No.	A/F Tag No.	Line no / Description	Access fitting orientation	Coupon Type	Coupon material	Surface area of the coupon (in ²)	Density of the coupon (gm/cm ³)	Coupon Holder Model / Length	Coupon Position	Coupon Install Date	Coupon Serial No	Coupon Original weight (gm)	Remarks
HALUL MOL													
1	50-XCC-1001	16" Crude Oil line from PS-3	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	62005-14.75"	BTM	29/06/2025	NF784	36.8815	
											NF785	37.0849	
HALUL NPG UNIT													
2	50-XCC-1019	6" Gas Fuel to Sludge Gather V-5066 6"-GF-503305-9144	Top Mounted 12 O' Clock Flanged access fitting	3" Strip	C 1018	5.2	7.86	6200-12.25"	BTM	29/06/2025	NF782	36.9298	
											NF783	36.7523	
3	50-XCC-1021	6" Gas Fuel to Sludge Gather V-5066 6"-GF-503305-9144	Top Mounted 12 O' Clock Flanged access fitting	3" Strip	C 1018	5.2	7.86	6200-12.50"	BTM	29/06/2025	NF780	37.0357	
											NF781	37.0378	

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

HALUL TANK CENTRAL MANIFOLD													
4	50-XCC-1000	36" Line to tank 36"-OC-500040	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	27/06/2025	XR923	17.5336	
5	50-XCC-1003	36" Line to tank 36"-OC-500041	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	27/06/2025	XR924	17.3668	
6	50-XCC-1006	36" Line to tank 36"-OC-500043	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	27/06/2025	XR920	17.5178	
7	50-XCC-1009	36" Line to tank 36"-OC-500044	Bottom Mounted 6 O' Clock	Disc Coupon	C 1018	2.5	7.86	6202-3.00"	BTM	27/06/2025	XR920	17.3496	
8	50-XCC-1018	Tank Shell NTF 5007	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inward	30/06/2025	XL039	25.3454	
									Mid		XL040	25.0136	
									Outward		XL036	25.4222	
											XL037	25.1282	
											BD694	26.8668	
9					C 1018	3.4	7.86		Inward	30/06/2025	XL044	25.6406	

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

	50-XCC-1020	Tank Shell NTF 5009	Mounted in Tank Shell	2" Ladder			6204-27.00"				XL045	25.1444		
											Mid			
											Outward			
												XL042	24.9222	
												XL043	25.5397	
												XL038	25.0200	
10	50-XCC-1022	Tank Shell NTF 5050	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"		01/07/2025	Inward	BD688	25.2356	Advise possibly Back Pressuring tool with water next time which may help with clearing sludge in the fitting.
											Mid	BD689	25.6236	
											Outward	BD686	25.5475	
												BD687	25.3053	
												BD684	25.2888	
												BD685	24.9865	
												BD696	25.6347	Advise possibly Back Pressuring tool with water next time which may help
												BD697	25.3478	
												BD698	24.9741	
11	50-XCC-1023	Tank Shell NTF 5051	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	01/07/2025		Inward	BD699	25.2004	
											Mid	BD700	25.2403	
											Outward	BD701	25.3176	

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PROJECT NAME:	Provision Of Corrosion Monitoring Services at Offshore and Mesaieed	CONTRACT REF. NO.:	LC241047A0
SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

														with clearing sludge in the fitting.	
HALUL SOUTH TANK FARMS															
12	50-XCC-1013	Tank Shell STF 5003	Mounted in Tank Shell	2" Ladder	C 1018	3.4	7.86	6204-27.00"	Inward	29/06/2025	XX278	24.4402			
											XX279	24.6842			
											XX276	24.7228			
									Mid		XX277	24.5922			
											XX274	24.3787			
									Outward		XX275	24.5838			
OLD METERING AREA															
13	50-XCC-1049	20"Oxy Tie-up Line 20"-OC-500573	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-20.25"	BTM	28/06/2025	NF778	36.9698			
											NF779	36.9546			
HALAL API PIT															
14	50-XCC-1052	10" Discharge of closed drain vessel V-5097 A&B 10"-OD-501561	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-7.25"	BTM	07/07/2025	NF804	36.9251			
						5.2	7.86				NF805	36.9251			

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

15	50-XCC-1053	8" Closed drain Pump Discharge 8"-OD-501548	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-6.25"	BTM	06/07/2025	NF806	36.7080	
						5.2	7.86				NF807	37.0496	
16	50-XCC-1054	8" Closed drain Header 8"-OD-501543	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-6.25"	BTM	07/07/2025	NE648	37.0355	
						5.2	7.86				NE649	36.7406	
17	50-XCC-1055	4" Open drain Tank discharge T-50100 A&B 4"-OD-501605	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-4.25"	BTM	07/07/2025	NF798	36.9232	
						5.2	7.86				NF799	36.9963	
18	50-XCC-1056	3" Open drain Pump discharge 3"-OD-501557	Top Mounted 12-O Clock	3" Strip	C 1018	5.2	7.86	6200-3.25"	BTM	06/07/2025	NF786	37.0495	
						5.2	7.86				NF787	37.0918	

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

APPENDIX – F

ER PROBES MONITORING DATA IN HALUL ISLAND

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LC241047A0 - PROVISION OF CORROSION MONITORING SERVICES AT OFFSHORE LOCATION - 1 ST Survey <u>3Q2025</u>										<u>Appendix D</u>	
SN	Tag No.	Line No. & Line Description	Installed Probe Model/ Length/ Type/ Element Type	Probe Span	Check ate ID	Reading Date	Check Reading	Div Reading	M. Loss	Corrosion Rate (mpy)	Remarks
Halul Island											
1	50-XCC-13001	18" Line to PS-1 Separation Tanks (18"-OC-50001) <u>16" Crude Oil Line from PS-3 (16"-OC-500663-61XXX)</u>	4500-T10-K03005-17.75-0	T10	N/A	28-06-2025	N/A	N/A	N/A	No probe exists. Solid Plug removed, new 17.75" T10 Cylindrical ER Probe installed. Manual reading obtained to confirm operation	
2	<u>XE-5003</u>			T20		29-06-2025	814	n/a	00	00	

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

APPENDIX – G

PHOTOGRAPHIC SHEET IN HALUL ISLAND

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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL NPG Unit

1.6"-GF-503305-9144

Tag no: 50-XCC-1019



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2.6"-GF-503305-9144

Tag no: 50-XCC-1021



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DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL MOL

3. 16"-OC-500663-61XXX

Tag no: 50-XCC-1001



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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL South Tank Farms

4. Tank Shell STF 5003

Tag no: 50-XCC-1013



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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL North Tank Farms

5. Tank Shell NTF 5006

Tag no: 50-XCC-1017



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6. Tank Shell NTF 5009

Tag no: 50-XCC-1020



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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL Tank Header Central Manifold

7. 36"-OC-500040

Tag no: 50-XCC-1000



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8. 36"-OC-500041

Tag no: 50-XCC-1003



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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL Old Metering Area

9. 20"-OC-500573

Tag no: 50-XCC-1049



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10. 20"-OC-500501

Tag no: 50-XCC-1026



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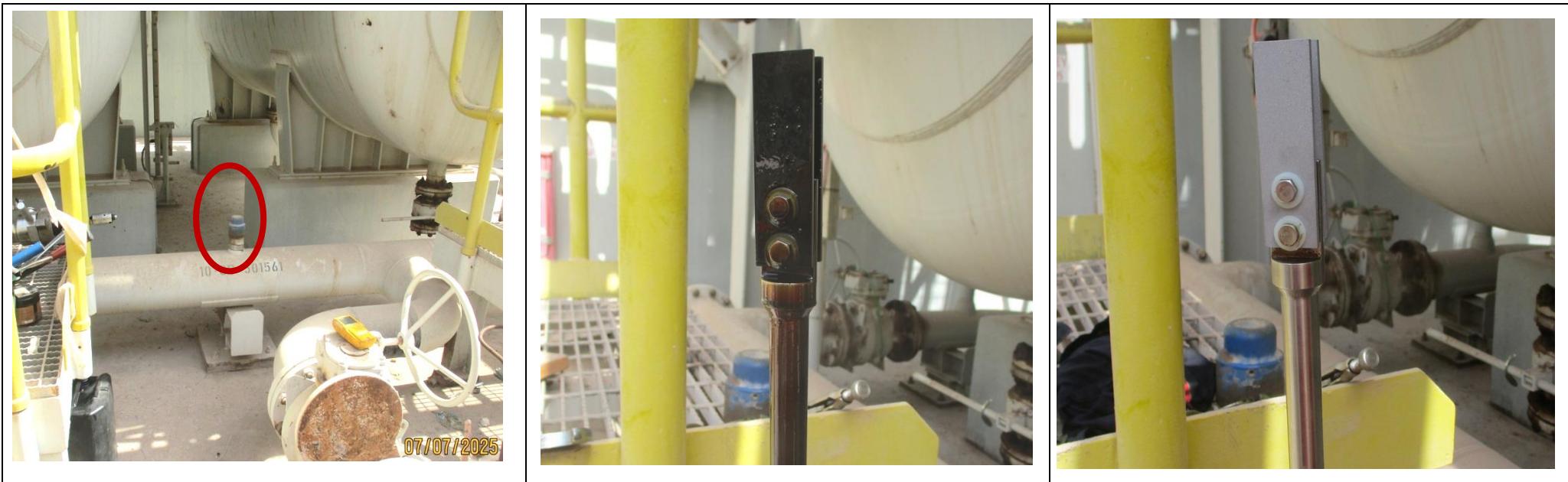
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SCOPE:	Corrosion Monitoring Services	REV. NO.:	1
DOCUMENT/LOCATION:	Corrosion Coupon Locations in Halul Island	SUBMISSION DATE:	17-11-25

LOCATION: HALUL API Pit

12. 10"-OD-501561

Tag no: 50-XCC-1052



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13. 8"-OD-501543

Tag no: 50-XCC-1054



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