

**SHAMS POWER COMPANY**  
**ENGINEERING DIVISION**  
**INSPECTION & CORROSION SECTION**  
**SHAMS 1**

**LOCATION : R1HAN50BB010**

**KKS : R1HAN50BB010**

**GRADE & CLASSIFICATION : 2**

**CERTIFICATE OF INSPECTION**

The equipment detailed below was examined in accordance with the SHAMS code of practice for plant inspection,

**ITEM : LP- Heater -2**

**LOCATION : SHAMS Plant**

**TYPE OF INSPECTION : Major**

**DATE OF INSPECTION : March, 2020**

**PLACE OF INSPECTION : IN-SITU**

**DATE OF LAST INSPECTION : Jan, 2016**

**REPORT :**

**1.0. SUMMARY**

The above LP Heater -2 was taken off line, isolated, opened, vented & cleaned for major external & internal inspections.

**2.0. SUBJECT**

2.1. This is a horizontal carbon steel shell with 304 L tube bundle.

Item	Shell Side	Tube side
Design pressure	5/-1 bar	16 bar
Design temperature	99 C	99 C
Operation pressure	0.556 bar	10.05 bar
Operation temperature	-	-
Hydro test pressure	7.2 bar	22.9 bar
Fluid	Steam/condensate	Water
Material	Carbon Steel	304 L
Tube Number		1002
Tube diameter		5/8 inch
Tube thickness		1.65 mm
Tube length		9500 mm

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The above equipment is/ ~~is not~~ considered suitable for further service under the present operating conditions

**NEXT MAJOR INSPECTION DUE : March 2024**

**INSPECTED: Osman Ismail**

**ENDORSEMENT: 48 MONTHS**

**REVIEWED: Ali Al Masabai**

### **3.0 HISTORY**

This LP heater -1 was commissioned in 2013. Periodical inspection records since Oct.'2014 are available..

### **4.0. SCOPE OF INSPECTION**

- 4.1 Visual Inspection
- 4.2 Eddy Current
- 4.3 Ultrasonic Thickness survey
- 4.4 Dye- penetrant
- 5.4 Borescope inspection

### **5.0. CONDITIONS FOUND**

#### **5.1. External (Shell side)**

- 5.1.1 All painting and insulation found intact without any evidence of painting peel off or blistering and no evidence of any damage for insulation or insulation cover aluminum sheet.
- 5.1.2 All ladders, stairways and handrails found in satisfactory condition.
- 5.1.3 All concrete support found in satisfactory condition without evidence of cracking or spalling.
- 5.1.4 All external piping insulation found in satisfactory condition.
- 5.1.5 All earthing lugs found in satisfactory condition.

#### **5.2. Internal (Tube side)**

- 5.2.1 All tubes as could see internal surfaces found satisfactory condition without evidence of corrosion, apart from a considerable amounts of deposits which have cleaned by high pressure hydro jetting.
- 5.2.3 All tube to tube sheet welds found in satisfactory condition.

### **6.0 NDT**

#### **6.1 Ultrasonic thickness survey**

Ultrasonic thickness measurement was carried out on accessible locations of channel found satisfactory with average thickness 10.44 mm. See attached thickness measurement report.

#### **6.2 Dye – Penetrant test**

Dye – Penetrant test was carried out on tube to tube sheet welds found satisfactory. See attached thickness measurement report.

#### **6.3 Eddy Current test**

Not done during 2020 outage

#### **6.4 borescope Inspection**

Not done during 2020 outage

### **7.0. Recommendations**

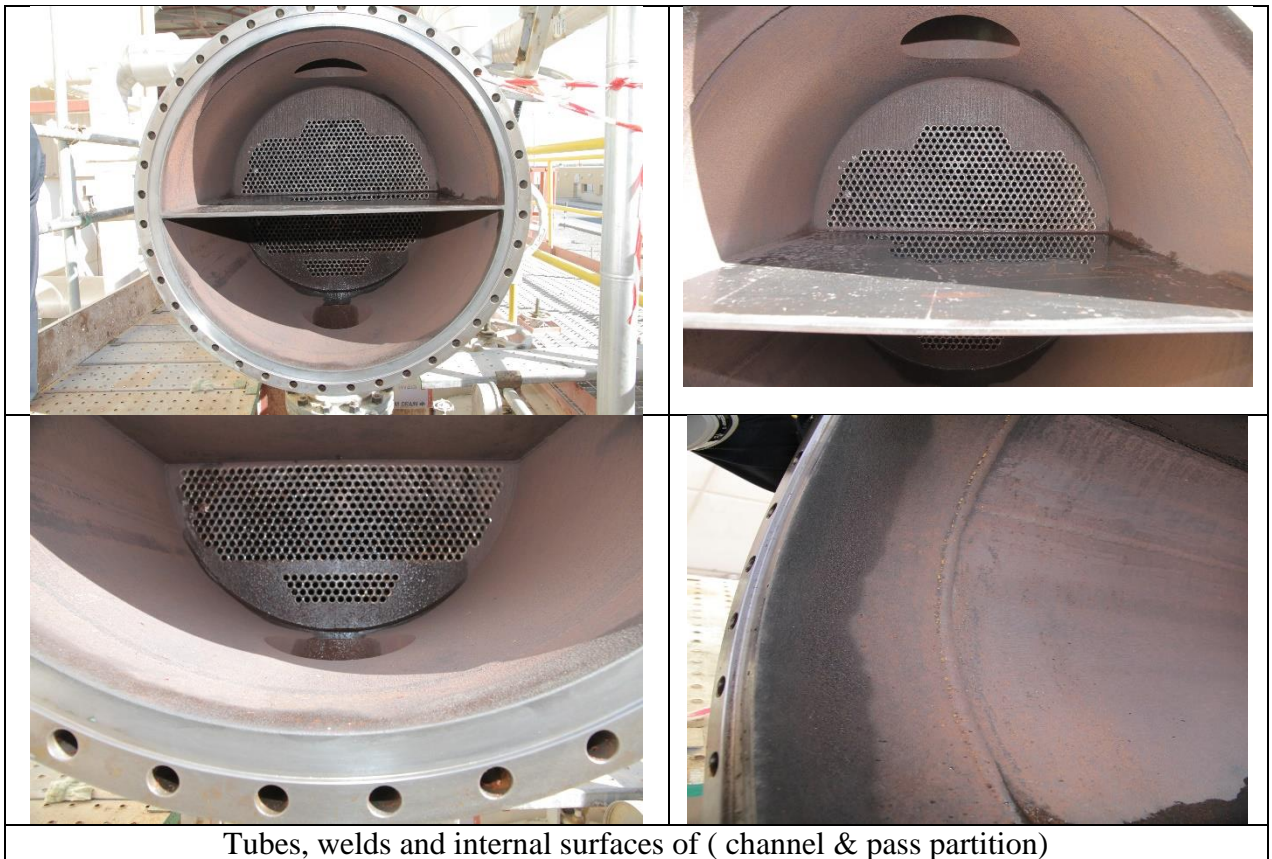
LP heater -2 should be open for inspection after four years as per SHAMS code of practice.

## 8.0 Inspection Grade and Interval

In accordance with the latest revision of SHAMS Code of Practice, this **LP Heater -2** was endorsed for 48 months under class 2, for next Major Inspection.

**FREQUENCY** : 48 MONTHS.  
**ENDORSEMENT** : 48 MONTHS,  
**GRADE** : 2  
**Next Major Insp. due** : March, 2024

### Photos



Tubes, welds and internal surfaces of ( channel & pass partition)

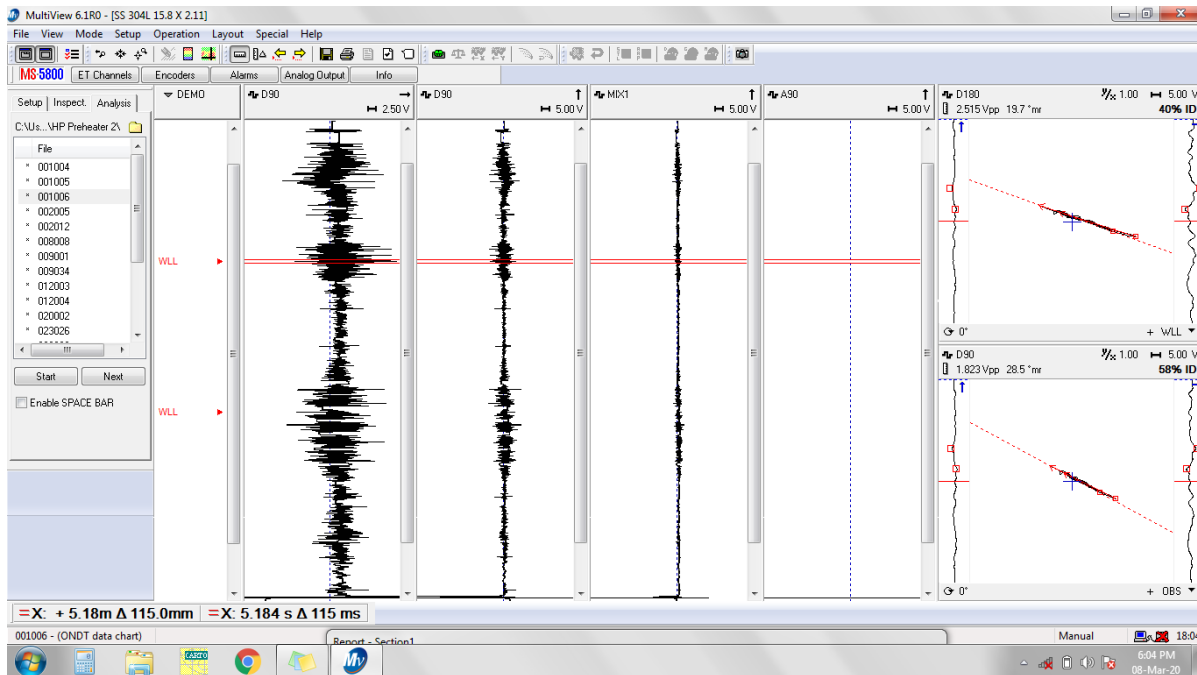
## ECT REPORT

<b>Client:</b> SHAMS POWER				<b>DATE:</b> 09/03/2020			
<b>Site:</b> Madinat Zayed, Abu Dhabi							
<b>Equipment Serial No:</b> HP Heater 2				<b>Tube Orientation:</b> U Tube			
<b>Operator\Analyst:</b> Yasir.A							
<b>Tube Dimension: -</b>	<b>OD:</b>	15.9mm	<b>Thickness:</b>	2.11 mm	<b>Tube Length:</b>		<b>Material:</b> SS-304
<b>Method:</b> ECT			<b>Equipment\System:</b> MS5800 (Sr/No:899458)			<b>Probe:</b> TEF-108-50	
<b>Total No of Tubes:</b> 1216 Nos.			<b>Tubes Inspected:</b> 18 Nos.			<b>Maximum defect</b>	40%
<p><b>Comments:</b> Tubes were found as fairly cleaned condition. Most of the tubes are exhibiting noisy signals suspected the presence of ferromagnetic contents in the tube material. All of these tube data are appeared as ID Corrosion in ECT analysis whereas which could not be relevant if any changes occurred on electrical conductivity and magnetic permeability of the material under test. More over there is chances to miss real defect indications if any exist within the noisy signals region.</p> <p>4 tubes were selected for boroscopy and found no visual defects in ID surface. ECT data images are attached in this report.</p> <p><b>Result:</b> See details below</p> <p><b>Tube counting:</b> Rows are counted from top to bottom and columns from left to right at east side Tube sheet</p> <p><b>WLL:</b> Wall Loss, <b>NDD:</b> No Defect Detected, <b>RST:</b> Restricted</p>							

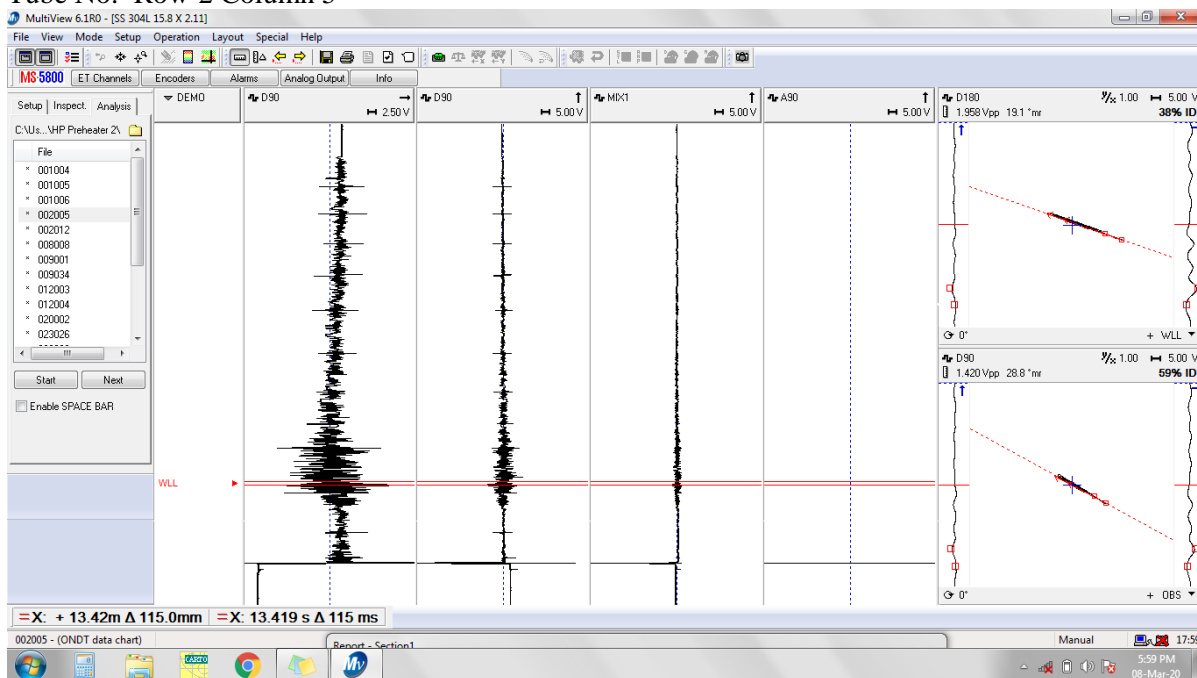
Row	Column	Defect	Eval.	Remarks
1	4	23%	ID	WLL
1	5	28%	ID	WLL
1	6	40%	ID	WLL
2	5	38%	ID	WLL
2	12	32%	ID	WLL
8	8	16%	ID	WLL
9	1	0%	-	NDD
9	34	26%	ID	WLL
12	3	12%	ID	WLL
12	4	0%	-	NDD
20	2	0%	-	NDD
23	26	24%	ID	WLL
23	36	20%	ID	WLL
23	38	17%	ID	WLL
23	39	19%	ID	WLL
29	1	0%	-	NDD
38	1	19%	ID	WLL
38	2	25%	ID	WLL

	TECHNICIAN	TPI	CLIENT
Name :	YASIR AHAMMED		
Signature :			
Date :	09.03.2020		

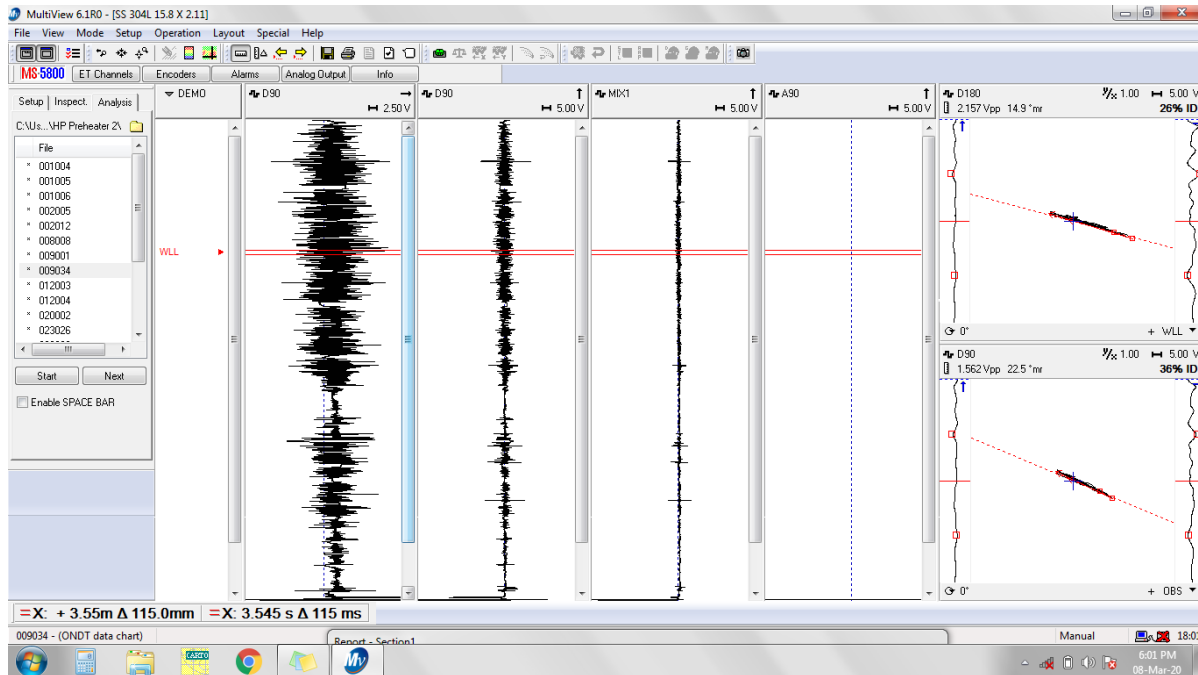
## Tube No: Row-1 Column 6



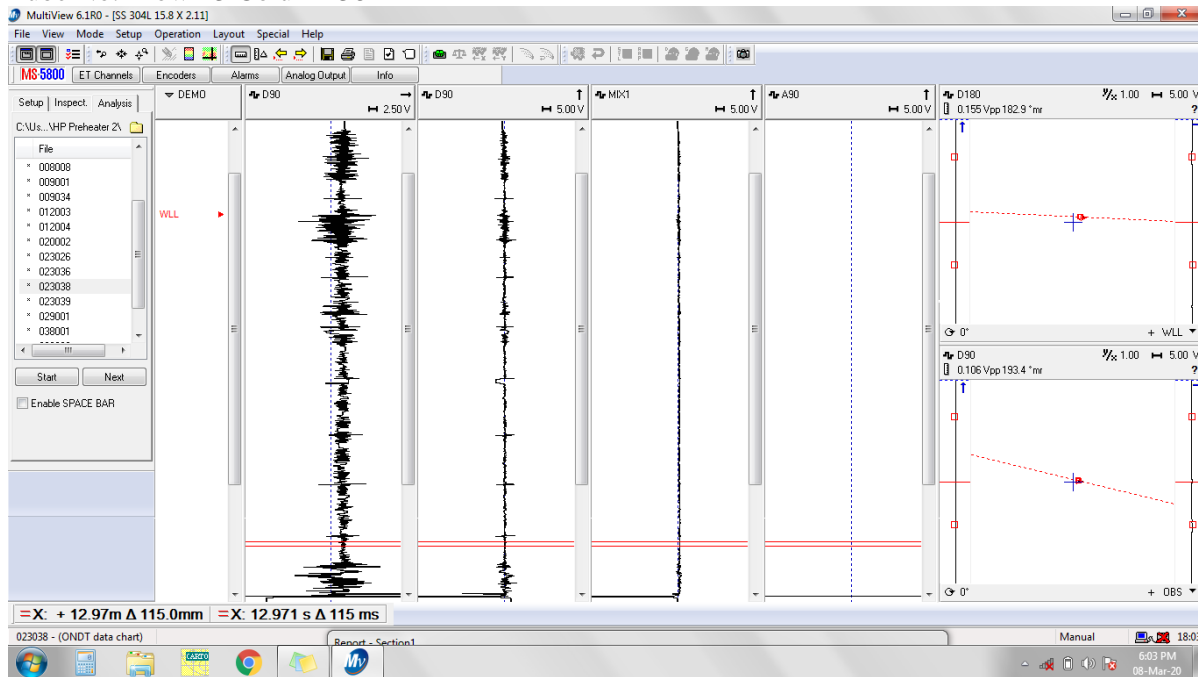
## Tube No: Row-2 Column 5



## Tube No: Row-09 Column 34



## Tube No: Row-23 Column 38





**LIQUID PENETRANT EXAMINATION REPORT**

Report No.:	AD / 53584	Date:	11.03.2020	Page:	1	Of	1
Client :	SHAMS POWER COMPANY	Job No. :	-				
Location :	MADINAT ZAYED	Item :	LP HEATER - 02				
Material :	CS	Ref / Procedure No. :	INS/ASME/PT/001				
Thickness :	VARIOUS	Revision :	22				
Surface condition :	AS WELDED & CLEANED	Test Temp. :	AMBIENT (25°)				
Viewing condition :	DAY LIGHT (>1076 LUX)	Penetrant Type / Technique :	VISIBLE SOLVENT REMOVABLE				
Penetrant dwell time :	10 MIN	Dev. Time:	10 MIN				
Date of test :	11.03.2020	ACCP - Criteria :	ASME SEC VIII DIV.1				
Consumables Type & Batch	MAGNAFLUX						

Penetrant Remover	Penetrant	Developer
SKC-S ( BATCH NO-180108) JAN 2021	SKL-SP2 ( BATCH NO-171201) DEC 2020	SKD-S2 ( BATCH NO-180102) JAN 2021

**Observation & Evaluation :**

# 100% DPT WAS CARRIED OUT ON THE TUBESHEET TO TUBE WELD JOINTS.

# EQUIPMENT NAME :- LP HEATER - 02

# PROJECT :- SHAMS OUTAGE MARCH -2020

# NO RELEVANT INDICATION WAS OBSERVED DURING THE TIME OF INSPECTION.

# FOUND ACCEPTABLE AS PER THE SPECIFICATION.

	ACCEPT	REJECT
RESULT	<input checked="" type="checkbox"/>	<input type="checkbox"/>

REPORT FORMAT APPLICABLE ONLY FOR AUH &amp; FUJ FACILITY

LEVEL II TECHNICIAN	CLIENT REP	AI / TPI
Name : VINEETH.P. Paulose Sign : Date : 11.03.2020 	Name : Sign : Date :	Name : Sign : Date :
Dubai Branch Sharjah Branch Abu Dhabi Branch Fujairah Branch Oman Branch Registered Office	Tel: 04 3241955 Tel: 06 5081300 Tel: 02 6225820 Tel: 09 2238754 Tel: 00968 2448 2391 Fax: 04 3241957 Fax: 06 5361173 Fax: 02 6225830 Fax: 09 2238754 Fax: 00968 2448 5855	Email: inspec.dhcoor@intertek.com Email: inspec.shcoor@intertek.com Email: inspec.adhcoor@intertek.com Email: inspec.fuicoor@intertek.com Email: inspec.muscoor@intertek.com INSPEC IS PART OF INTERTEK GROUP For Comments & Suggestions: Please email to suggestions.inspec@intertek.com

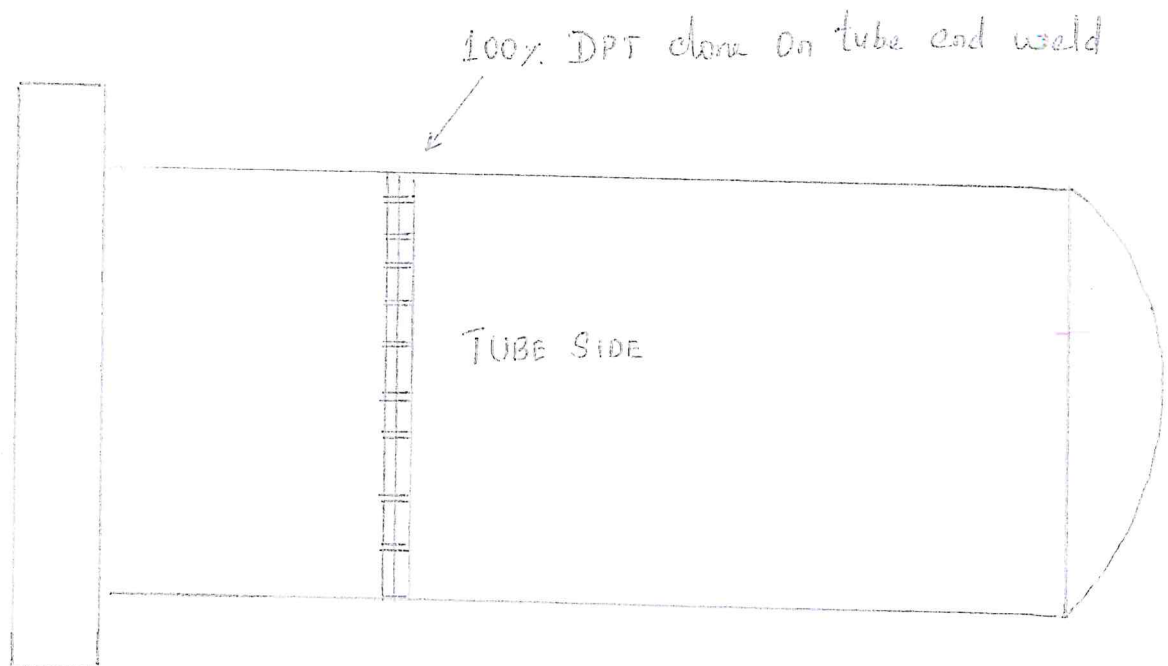
Refer Doc-19 for Intertek General Terms and Conditions of Services. This report is valid only if signed and stamped ( Numbered Stamp ) by Level II / Level III.

LP HEATER 2

11/03/2020

KKS R1LCL20AC001

DIE PENETERENT TEST



Penetrant test result: No defects identified & the material condition is good.

R.NO. 53584

VINEETH



## HEAT EXCHANGER

