

SHAMS POWER COMPANY
ENGINEERING DIVISION
INSPECTION & CORROSION SECTION
SHAMS 1

LOCATION : R1LBA01BC001
KKS : R1LBA01BC001
GRADE & CLASSIFICATION : 2

CERTIFICATE OF INSPECTION

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

ITEM : **Booster heater-1**

LOCATION : **SHAMS Plant**

TYPE OF INSPECTION : **Major**

DATE OF INSPECTION : **March, 2020**

PLACE OF INSPECTION : **IN-SITU**

DATE OF LAST INSPECTION : **January, 2019**

REPORT :

1.0. SUMMARY

The above booster heater was taken off line, isolated, opened, vented & cleaned for major external & internal inspections and prepared with the required scaffolding.

2.0. SUBJECT

2.1. This is a vertical, cylindrical heater.

Size	Stack Height 13.6
Tube material	P91
Tube supports material	Top : A351 HK40 X End: SA-516 Gr 70
Tube size	Outer diameter 114mm Sch80 corrosion allowance 1.5mm
Number of tubes	104 vertical tubes
Design pressure	Convection: 110 bar X radiant: 110 bar
Design temperature of cleaned tube	Radiant: 601c X convection: 526c for steam
Operating Temperature	390-540c
Operating pressure	93 barg
Insulation	Cast-able refractory

Heater has 13 inlets and outlets. Pressure and temperature at inlets are 98 bar, 360c and 96 bar, 534c at outlets "maximum load".

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

NEXT MAJOR INSPECTION DUE : January 2022

INSPECTED: Osman Ismail

ENDORSEMENT: 48 MONTHS

REVIEWED: Ali Al Masabai

3.0 HISTORY

This heater was commissioned in 2013. Some periodical inspection pictures and reports since Dec.'2014 are available.

4.0. SCOPE OF INSPECTION

- 4.1. Visual Inspection of internal and external.
- 4.2 Replica test
- 4.3 Ultrasonic thickness survey

5.0. CONDITIONS FOUND

5.1. External:

- 5.1.1 All painting especially around burners found intact without any evidence of peel off, blistering or overheating, apart from minor color change (blue to white) at very few locations around burner due to very minor flue gas leakage or heat transfer by bracket support impeded in refractory.
- 5.1.2 All burners connected piping and houses found satisfactory without evidence of any damages.
- 5.1.3 All ladders, stairways and handrails found in satisfactory condition.
- 5.1.4 All concrete support found in satisfactory condition without evidence of cracking or spalling.
- 5.1.5 Manhole found in satisfactory condition without evidence of flue gas leaking or burning, apart from some peep holes found not opening properly.
- 5.1.6 All external piping insulation found in satisfactory condition.
- 5.1.7 All earth lugs found in satisfactory condition.

5.2. Internal:

- 5.2.1. All external surfaces of all radiation and convection tubes found in satisfactory conditions without evidence of creep, bowing, sagging and overheating.
- 5.2.2 All piping supports and hungers found satisfactory conditions without evidence of damage or broken.
- 5.2.3 All insulation (fibers and anchors) found in satisfactory conditions in radiation and convection zones.
- 5.2.5 All floor bricks found in satisfactory condition apart from minor separation between floor bricks.
- 5.2.6 Burners found in satisfactory condition without evidence of back fire apart from minor deposit on burner opening most probably due to burned fallen refractory materials.
- 5.2.7 Refractory around burners found in satisfactory condition without evidence of cracking or spalling.
- 5.2.8 Fallen down small parts of refractory material found scattered on floor.
(See below attached photos)

5.4 Nondestructive tests

5.4.1 Ultrasonic thickness survey

It was carried out on all tubes at different locations. All reading found satisfactory without evidence of thickness reduction.

5.5 Replica test

It was carried out on 6 on the hottest locations of the tubes. All found satisfactory without any creep voids or metallurgical changes to the original tempered martensitic structure.

6.0. Recommendations

- 6.1 All deposited material on burner opening should be cleaned.
- 6.2 Peep holes should be clean and maintain to open smoothly to allow operators clearly check flame condition.
- 6.3 Heater to be inspected after 4 years as per SHAMS Code of Practice.

7.0. Inspection Grade and Interval

In accordance with the latest revision of SHAMS Code of Practice, this booster heater-1 was endorsed for 48 months for next Major Inspection.

FREQUENCY : 48 MONTHS.
ENDORSEMENT : 48 MONTHS,
Next Major Insp. due : January 2022

8.0 Booster Heater Pilot Burner Modification

8.1 Overview

During Outage 2020, pilot burner of BHs was replaced by new higher capacity continuously running pilot burner in order to run BH with lower steam flow requirement. This will help to evaporate the condensate inside U type steam tubes of BHs without much reduction in temperature of BHs' downstream header. Ultimately, it will save gas consumption in HTF-Hs which will be used in BH to generate electricity more efficiently.

The old burner system includes an intermittent igniter. This igniter is brought into service following a purge cycle and is used to ignite main burner operation. Following main burner ignition, the igniter is removed from service.

To accommodate the above mentioned requirement for low heat input stand-by service, a new larger igniter was retrofitted. It will be light off prior to main burner start. Logic in BH PLC were implemented to avoid the pilot burner operation continuously during main burner firing.

8.2 Logic Modifications

During the light-off sequence, rather than an automatic transfer from igniter operation to main burner operation, when the igniter is brought into service the BMS system will hold this condition giving indication of HOT STANDBY MODE. Air control devices should be held in minimum light-off positions.

Following a 10 second delay, an option should be provided to site operators to TRANSFER TO MAIN BURNER. This option would continue the already programmed transition sequence to main burner operation. After this transition, the system will release to modulate per current logic.

A flame scanner signal must be maintained during all modes or otherwise the system should initiate a trip.

No automated adjustment of igniter heat input is included in the system. Rather, adjustment of igniter heat input will require mechanical adjustment of the igniter regulator spring setting.

Form No.: IN-LABF-12 Rev. 6 Dtd.: 15-Nov-2018

REPLICA METALLOGRAPHY REPORT

DATE OF TEST:	7-Mar-2020	REPORT NO.:	LAB/AD/457	DATE OF REPORT:	25-Mar-2020	PAGE:	1	OF	1
CLIENT:	SHAMS POWER COMPANY								
JOB No.:	574								

CONTACT DETAILS: Mr. Osman Ismail

REPLICA METALLOGRAPHY (As per ASTM E-1351)

Project:	Maintenance Shutdown
Vessel:	BOOSTER HEATER NO. 1
Size:	N/A
Material:	ASTM A333 Gr. P91
Locations:	12 o'clock; Outlet Tube No. 1- TOP
Spot No.:	1

PHOTOS:


Location: Base Metal ; Etchant: Fry's Reagent; Magnification: 200x

Observations:

Microstructure revealed equiaxed ferrite with some tempered martensite and carbides in sharp contrast to the fully tempered martensite structure of the virgin material.

No other metallurgical anomalies were observed.

Mechanical Lab Supervisor

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 Sign :
 Date :

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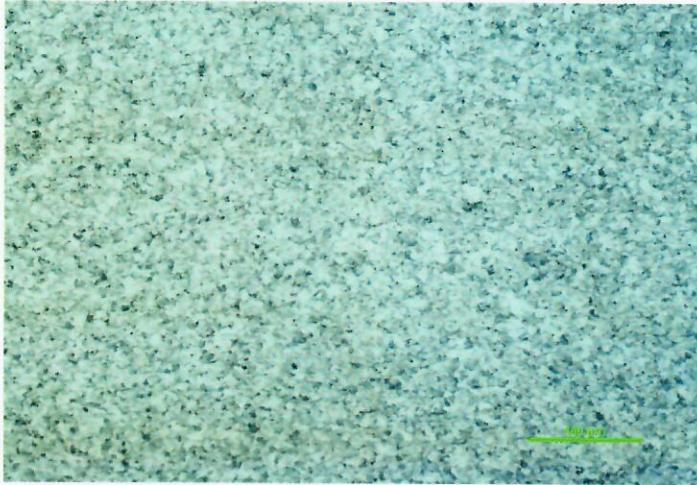
REPLICA METALLOGRAPHY REPORT

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CLIENT:	SHAMS POWER COMPANY								
JOB No.:	574								

CONTACT DETAILS: Mr. Osman Ismail

REPLICA METALLOGRAPHY (As per ASTM E-1351)

Project:	Maintenance Shutdown
Vessel:	BOOSTER HEATER NO. 1
Size:	N/A
Material:	ASTM A335 Gr. P91
Locations:	3 o'clock; Outlet Tube No. 25- TOP
Spot No.:	2

PHOTOS:


Location: Base Metal ; Etchant: Fry's Reagent; Magnification: 200x

Observations:

Microstructure revealed equiaxed ferrite with some tempered martensite and carbides in sharp contrast to the fully tempered martensite structure of the virgin material.

No other metallurgical anomalies were observed.


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CLIENT:	SHAMS POWER COMPANY								
JOB No.:	574								

CONTACT DETAILS: Mr. Osman Ismail

REPLICA METALLOGRAPHY (As per ASTM E-1351)

Project:	Maintenance Shutdown
Vessel:	BOOSTER HEATER NO. 1
Size:	N/A
Material:	ASTM A335 Gr. P91
Locations:	6 o'clock; Outlet Tube No. 56- MID
Spot No.:	3

PHOTOS:



Location: Base Metal ; Etchant: Fry's Reagent; Magnification: 200x

Observations:

Microstructure revealed equiaxed ferrite with some tempered martensite and carbides in sharp contrast to the fully tempered martensite structure of the virgin material.

No other metallurgical anomalies were observed.



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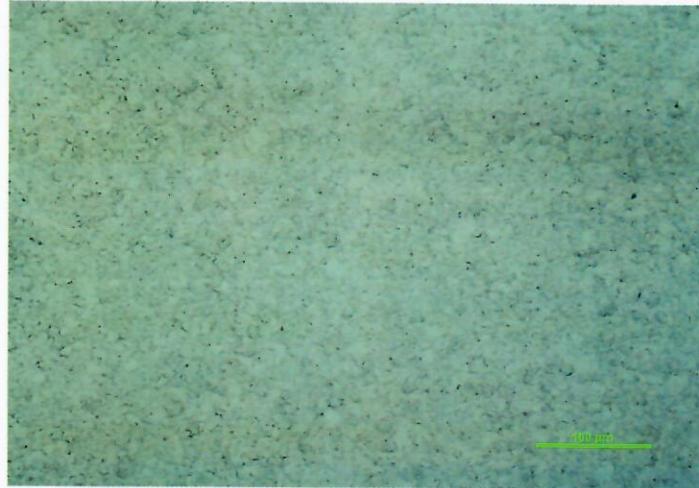
DATE OF TEST:	7-Mar-2020	REPORT NO.:	LAB/AD/460	DATE OF REPORT:	25-Mar-2020	PAGE:	1	OF	1
CLIENT:	SHAMS POWER COMPANY								
JOB No.:	574								

CONTACT DETAILS: Mr. Osman Ismail

REPLICA METALLOGRAPHY (As per ASTM E-1351)

Project:	Maintenance Shutdown
Vessel:	BOOSTER HEATER NO. 1
Size:	N/A
Material:	ASTM A335 Gr. P91
Locations:	9 o'clock; Outlet Tube No. 81- MID
Spot No.:	4

PHOTOS:



Location: Base Metal ; Etchant: Fry's Reagent; Magnification: 200x

Observations:

Microstructure revealed equiaxed ferrite with some tempered martensite and carbides in sharp contrast to the fully tempered martensite structure of the virgin material.

No other metallurgical anomalies were observed.

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REPLICA METALLOGRAPHY REPORT

DATE OF TEST:	7-Mar-2020	REPORT NO.:	LAB/AD/461	DATE OF REPORT:	25-Mar-2020	PAGE:	1	OF	1
CLIENT:	SHAMS POWER COMPANY								
JOB No.:	574								

CONTACT DETAILS: Mr. Osman Ismail

REPLICA METALLOGRAPHY (As per ASTM E-1351)

Project:	Maintenance Shutdown
Vessel:	BOOSTER HEATER NO. 1
Size:	N/A
Material:	ASTM A335 Gr. P91
Locations:	12 o'clock; Outlet Tube No. 1- MID
Spot No.:	5

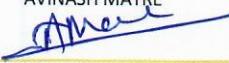
PHOTOS:


Location: Base Metal ; Etchant: Fry's Reagent; Magnification: 200x

Observations:

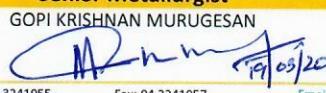
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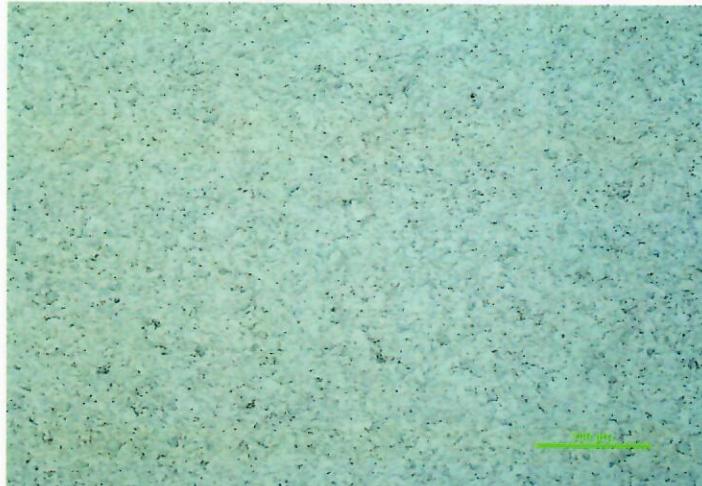
REPLICA METALLOGRAPHY REPORT

DATE OF TEST:	7-Mar-2020	REPORT NO.:	LAB/AD/462	DATE OF REPORT:	25-Mar-2020	PAGE:	1	OF	1
CLIENT:	SHAMS POWER COMPANY								
JOB No.:	574								

CONTACT DETAILS: Mr. Osman Ismail

REPLICA METALLOGRAPHY (As per ASTM E-1351)

Project:	Maintenance Shutdown
Vessel:	BOOSTER HEATER NO. 1
Size:	N/A
Material:	ASTM A335 Gr. P91
Locations:	3 o'clock; Outlet Tube No. 33- MID
Spot No.:	6

PHOTOS:


Location: Base Metal ; Etchant: Fry's Reagent; Magnification: 200x

Observations:

Microstructure revealed equiaxed ferrite with some tempered martensite and carbides in sharp contrast to the fully tempered martensite structure of the virgin material.

No other metallurgical anomalies were observed.


Mechanical Lab Supervisor

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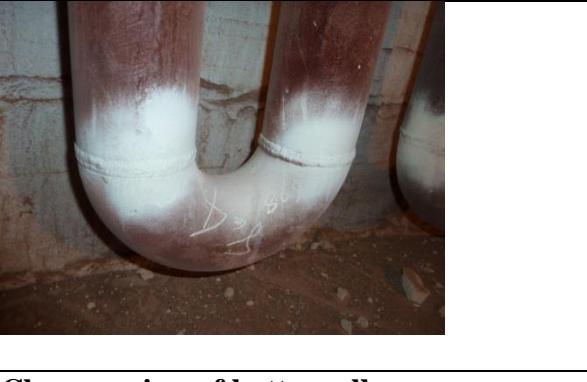
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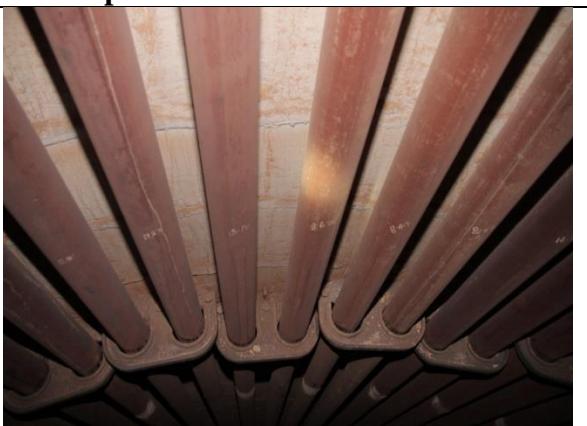
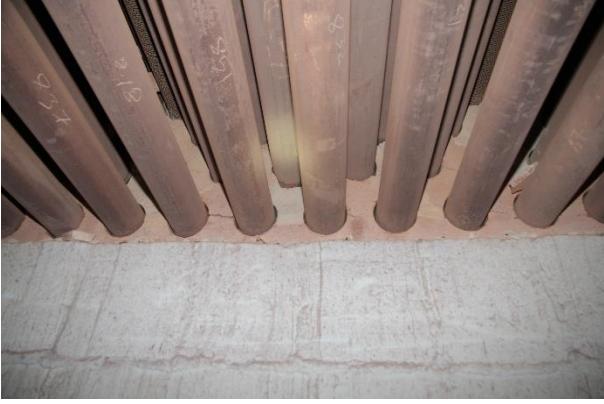
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Photos

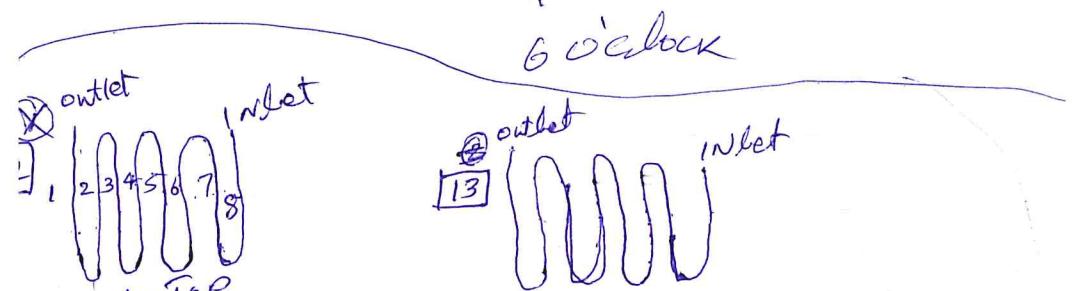
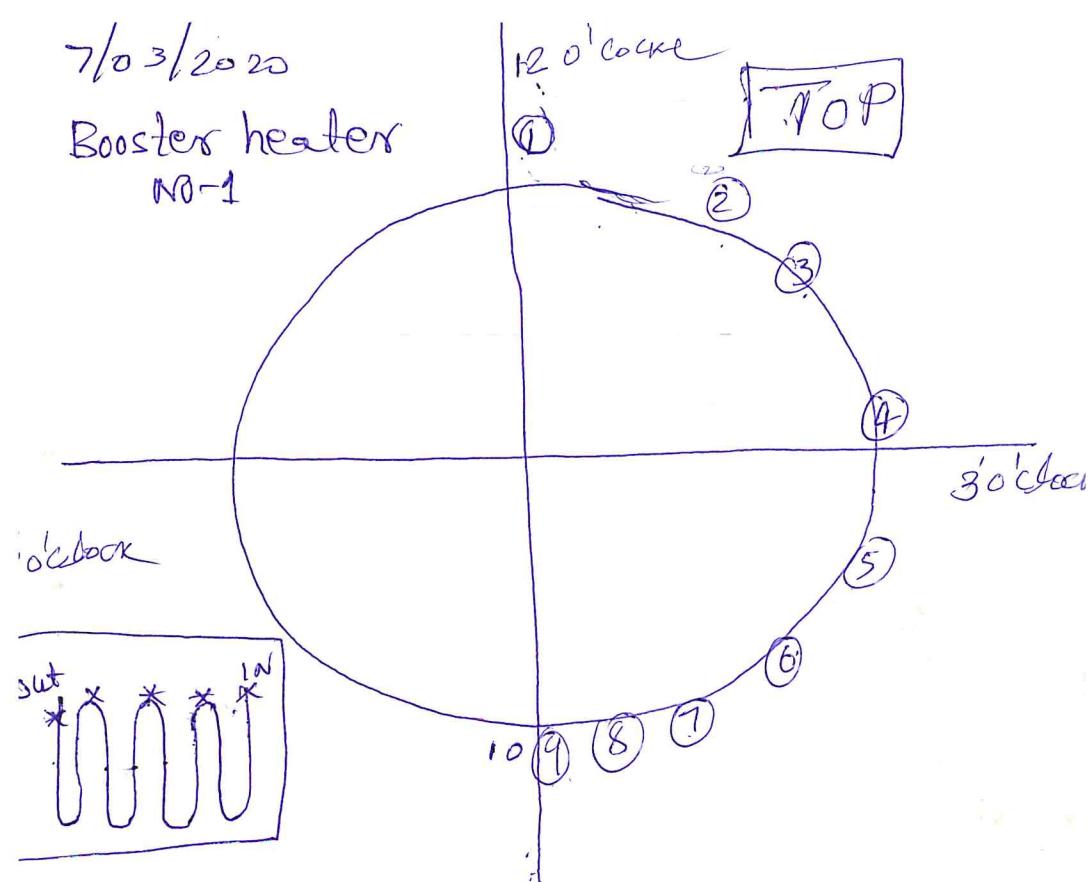
	
General view of booster heater -1	Burner connected piping
	
Concrete support	Earthing lug
	
Ladder, stairways and handrail	Burner assembly

	
Refractory around burner 	Burner blades 
Floor bricks 	Fallen down refractory materials 
	Close up view of bottom elbow 
Many way	General view of radiation and convection zone tubes

	
Close up to top supports of radiation zone	Close up view of radiation tubes.
	
Close up view of wall insulation at radiation zone	Close up view of pipe support at radiation zone
	
General view of top tube and insulation radiation zone	Finned tubes in convection zone
	
Insulation in top side of radiation zone	Bottom elbows of radiation zone

7/03/2020

Booster heater
No-1



$$① \text{Tube} = 16.42 \text{ (outlet)}$$

$$②, ③ \text{Elbow} = 12.14, 11.95$$

$$④, ⑤ \text{Elbow} = 12.00, 11.96$$

$$⑥, ⑦ \text{Elbow} = 8.55, 9.00$$

$$⑧, ⑨ \text{Elbow} = 8.57, 8.43 \text{ (inlet)}$$

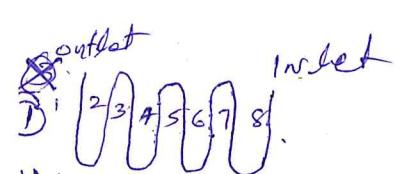
$$① \text{elbow} = 16.09, 15.68 \text{ (outlet)}$$

$$②, ③ \text{elbow} = 12.9, 12.58$$

$$④, ⑤ \text{elbow} = 12.40, 11.83$$

$$⑥, ⑦ \text{elbow} = 8.80, 8.62$$

$$⑧ \text{Tube} = 7.94, 7.99 \text{ (inlet)}$$



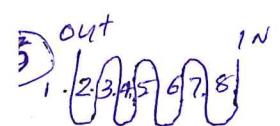
Tube = 16.53, 16.79 (outlet)

Elbow = 13.24, 13.3

Elbow = 12.18, 12.08

Elbow = 8.59, 8.55

Tube = 7.95, 8.05 (inlet)



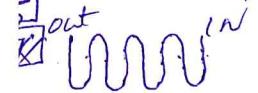
Tube = 16.73, 16.78 (outlet)

Elbow = 14.10, 13.80

Elbow = 13.11, 13.20

Elbow = 8.37, 8.20

Tube = 8.42, 8.48 (inlet)



Tube = 16.02, 16.13 (out)

Elbow = 12.48, 12.46

Elbow = 12.35, 11.56

Elbow = 8.75, 8.59

Tube = 8.15, 8.27 (in)



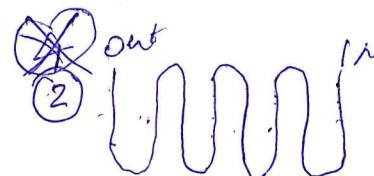
Tube = 16.41, 16.46 (out)

Elbow = 13.40, 13.22

Elbow = 12.08, 12.02

Elbow = 8.46, 8.33

~~Tube~~ = 8.16, 7.85 (in)



① Tube = 18.20, 17.76 (outlet)

② Elbow = 13.85, 13.62

③ Elbow = 13.13, 13.01

④ Elbow = 9.15, 8.73

⑤ Tube = 8.10, 8.23 (inlet)



① Tube = 16.58, 16.68 (outlet)

② Elbow = 13.01, 12.93

③ Elbow = 11.96, 12.13

④ Elbow = 8.42, 8.12

⑤ Tube = 8.08, 8.05 (outlet)



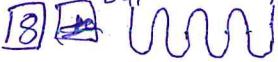
① Tube = 16.44, 16.48 (out)

② Elbow = 11.88, 11.76

③ Elbow = 13.00, 12.88

④ Elbow = 8.55, 8.37

⑤ ~~Tube~~ = 8.37, 8.20 (in)



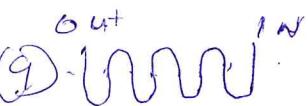
① Tube = 16.63, 17.10 (out)

② Elbow = 11.96, 12.13

③ Elbow = 12.09, 12.02

④ Elbow = 8.34, 8.15

⑤ ~~Tube~~ = 8.05, 8.12 (in)

⑨ 

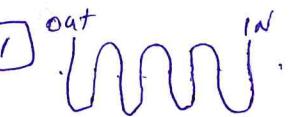
① Elbow = 15.89, 15.85 (out)

② Elbow = 11.92, 12.08

③ Elbow = 12.45, 12.88

④ Elbow = 8.02, 8.25

⑤ Tube = 7.86, 7.92 (in)

⑥ 

① Tube = 16.78, 16.82 (out)

② Elbow = 13.48, 13.41

③ Elbow = 13.40, 13.35

④ Elbow = 8.68, 8.38

⑤ Tube = 7.80, 7.83

⑩ 

① Tube = 16.55, 16.50 (out)

② Elbow = 14.04, 13.75

③ Elbow = 13.50, 13.89

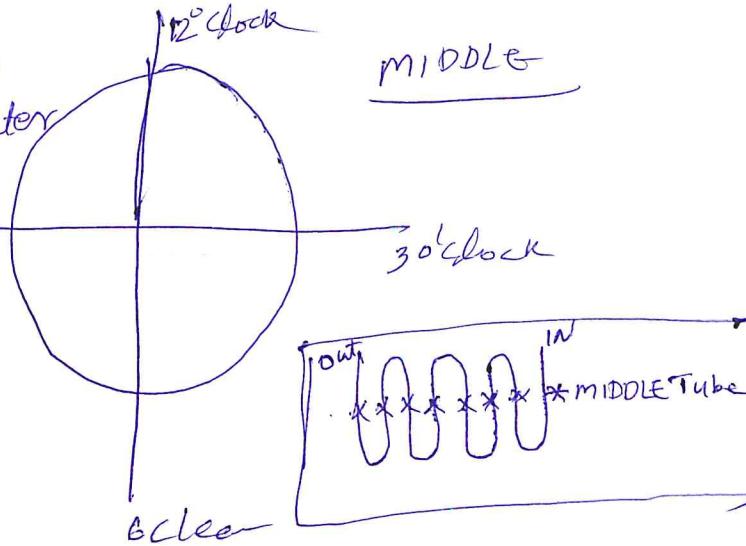
④ Elbow = 8.45, 8.48

⑤ Tube = 7.89, 7.96 (in)

07/03/2020

Brisiter heater
NB-1

90° dock



① MIDDLE-Tube

- ① ~~Tube outlet~~ = 16.95
- ② ~~Tube~~ = 16.89
- ③ ~~Tube~~ = 12.48
- ④ ~~Tube~~ = 13.05
- ⑤ ~~Tube~~ = 13.07
- ⑥ ~~Tube~~ = 8.22
- ⑦ ~~Tube~~ = 7.80
- ⑧ ~~Tube inlet~~ = 8.00

② MIDDLE Tube

- ① ~~outlet~~ ~~Tube~~ = 16.80
- ② ~~Tube~~ = 16.50
- ③ ~~Tube~~ = 12.86
- ④ ~~Tube~~ = 13.00
- ⑤ ~~Tube~~ = 12.3
- ⑥ ~~Tube~~ = 8.60
- ⑦ ~~Tube~~ = 8.04
- ⑧ ~~Tube~~ = 7.96 (Inlet)

③ MIDDLE Tube

- ① ~~Tube~~ = 16.8 (ab)
- ② ~~Tube~~ = 16.4
- ③ ~~Tube~~ = 12.63
- ④ ~~Tube~~ = 12.65
- ⑤ ~~Tube~~ = 12.00
- ⑥ ~~Tube~~ = 8.35
- ⑦ ~~Tube~~ = 8.42
- ⑧ ~~Tube~~ = 8.09

④ MIDDLE Tube

- ① ~~Tube~~ = 17.00 (outlet)
- ② ~~Tube~~ = 16.78
- ③ ~~Tube~~ = 12.78
- ④ ~~Tube~~ = 13.15
- ⑤ ~~Tube~~ = 12.8
- ⑥ ~~Tube~~ = 8.60
- ⑦ ~~Tube~~ = 7.96
- ⑧ ~~Tube~~ = 7.88

⑤ MIDDLE Tube

- ① ~~Tube~~ = 16.25 (outlet)
- ② ~~Tube~~ = 17.10
- ③ ~~Tube~~ = 12.40
- ④ ~~Tube~~ = 12.96
- ⑤ ~~Tube~~ = 12.78
- ⑥ ~~Tube~~ = 8.10
- ⑦ ~~Tube~~ = 8.16
- ⑧ ~~Tube~~ = 8.20

⑥ MIDDLE Tube

- ① 16.70 out
- ② 16.24
- ③ 13.45
- ④ 12.93
- ⑤ 12.83
- ⑥ 8.20
- ⑦ 7.77
- ⑧ 7.85 IN

7 MIDDLE tube

- ① = 16.10 outlet
 ② = 16.09.
 ③ = 12.65
 ④ = 13.10
 ⑤ = 12.85
 ⑥ = 8.31
 ⑦ = 8.30
 ⑧ = 8.09 [IN]
- ① 16.34 outlet
 ② 16.72
 ③ 12.25
 ④ 13.13
 ⑤ 12.90
 ⑥ 7.85
 ⑦ 8.30
 ⑧ 8.32 [IN]
- ① ~~16.21~~ outlet 16.21
 ② 16.20
 ③ 12.88
 ④ 13.03
 ⑤ 13.08
 ⑥ 8.52
 ⑦ 8.15
 ⑧ 8.01 [IN]

10

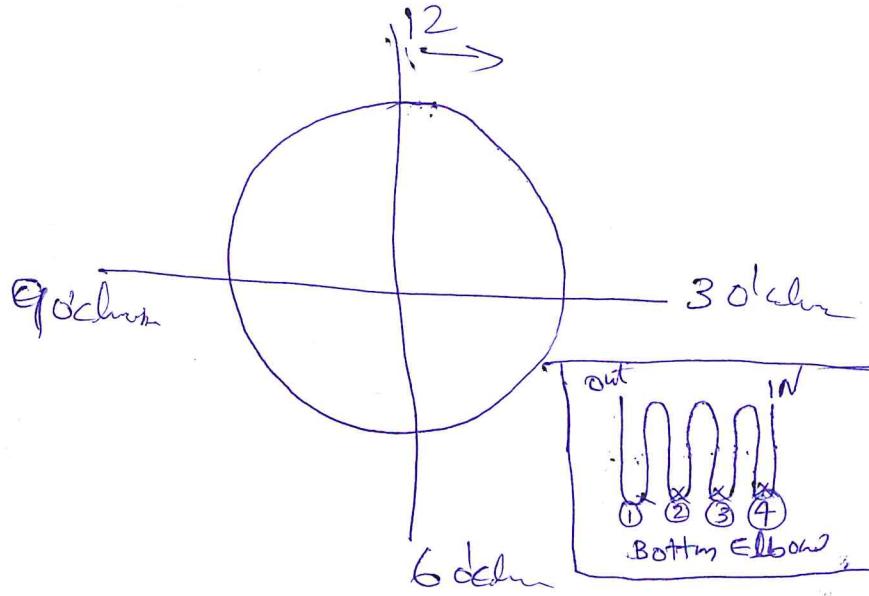
MIDDLE tube

- ① 16.40 [outlet]
 ② 16.14
 ③ 12.86
 ④ 12.65
 ⑤ 12.44
 ⑥ 8.06
 ⑦ ~~8.05~~
 ⑧ 8.10 [INlet]
- ① 16.75 outlet
 ② 16.50
 ③ 13.15
 ④ 12.65
 ⑤ 12.86
 ⑥ 8.20
 ⑦ 7.95
 ⑧ 8.50 [INlet]
- ① 17.20 outlet
 ② 16.58
 ③ 12.65
 ④ 13.30
 ⑤ 12.77
 ⑥ 8.10
 ⑦ 8.35
 ⑧ 8.15 (INlet)

13

MIDDLE tube

- ① 16.20 outlet
 ② 16.65
 ③ ~~13.02~~
 ④ 12.25
 ⑤ 13.05
 ⑥ 7.73
 ⑦ ~~8.50~~
 ⑧ 7.93 [IN]



- 1 Bottom elbow 2 Bottom elbow 3 Bottom elbow 4 Bottom elbow
- | | | | |
|---------------|---------------|---------------|---------------|
| ① 18.48 (out) | ① 18.60 (out) | ① 19.20 (out) | ① 17.70 (out) |
| ② 13.99 | ② 12.74 | ② 12.12 | ② 12.93 |
| ③ 8.00 | ③ 8.33 | ③ 8.54 | ③ 8.70 |
| ④ 8.39 (in) | ④ 8.80 (in) | ④ 8.03 (in) | ④ 8.46 (in) |
-
- 5 Bottom elbow 6 Bottom elbow 7 Bottom elbow 8 Bottom elbow
- | | | | |
|--------------------------|---------------|---------------|---------------|
| ① 17.90 (out) | ① 17.55 (out) | ① 18.10 (out) | ① 17.30 (out) |
| ② 12.12 | ② 13.40 | ② 12.10 | ② 12.30 |
| ③ 8.39 | ③ 8.50 | ③ 8.34 | ③ 8.23 |
| ④ 8.75 (in) | ④ 9.15 (in) | ④ 8.30 (in) | ④ 8.65 (in) |
-
- 9 Bottom elbow 10 Bottom elbow 11 Bottom elbow 12 Bottom elbow
- | | | | |
|---------------|---------------|---------------|---------------|
| ① 17.50 (out) | ① 18.66 (out) | ① 18.60 (out) | ① 17.85 (out) |
| ② 13.10 | ② 13.11 | ② 12.40 | ② 14.70 |
| ③ 8.90 | ③ 8.10 | ③ 8.70 | ③ 8.25 |
| ④ 8.42 (in) | ④ 8.65 (in) | ④ 8.50 (in) | ④ 8.30 (in) |
-
- 13 Bottom elbow
- | | |
|---------------|-------------|
| ① 17.73 (out) | ③ 8.34 |
| ② 13.55 | ④ 8.28 (in) |

International Inspection Services Ltd.

NON DESTRUCTIVE TESTING, HEAT TREATMENT, ADVANCED INSPECTION SERVICES,
CALIBRATION SERVICES AND MECHANICAL & METALLURGICAL LAB SERVICES

intertek.com

Form No.: IN-OPF-04 Rev. 13E Dtd. 20-03-2019

LIQUID PENETRANT EXAMINATION REPORT

Report No.:	AD / 53585	Date:	12.03.2020	Page:	1	Of	1
Client :	SHAMS POWER COMPANY	Job No. :					
Location :	MADINAT ZAYED	Item :	BOOSTER HEATER - 1				
Material :	INCONEL	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 :	12.03.2020	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 THERMOCUPLE COVER WELD JOINTS.(AFTER PWHT)

EQUIPMENT NAME :- BOOSTER HEATER - 1

LINE NO :- R1LBA01

JOINT NO :- CT014,CT015,CT017,CT019,CT020,CT021,CT022,CT025,CT016.

PROJECT :- SHAMS OUTAGE MARCH -2020

NO RELEVANT INDICATION WAS OBSERVED DURING THE TIME OF INSPECTION.

FOUND ACCEPTABLE AS PER THE SPECIFICATION.

ACCEPT REJECT

RESULT

REPORT FORMAT APPLICABLE ONLY FOR AUH & FUJ FACILITY							
LEVEL II TECHNICIAN		CLIENT REP		AI / TPI			
Name :	VINEETH P Paulose	Name :		Name :			
Sign :		Sign :		Sign :			
Date :	Level II No. L 71	Date :		Date :			
Dubai Branch	1/F O Box: 5065, Dubai, UAE	Tel: 04 3241955	Fax: 04 3241957	Email: inspec_dxbcoor@intertek.com			
Sharjah Branch	1/F O Box: 6110, Sharjah, UAE	Tel: 06 5061360	Fax: 06 5361173	Email: inspec_shjcoor@intertek.com			
Abu Dhabi Branch	1/F O Box: 41337, Abu Dhabi, UAE	Tel: 02 6225820	Fax: 02 6225830	Email: inspec_adhcoor@intertek.com			
Fujairah Branch	1/F O Box: 7907, Fujairah, UAE	Tel: 09 2238754	Fax: 09 2238754	Email: inspec_fujcoor@intertek.com			
Oman Branch	1/F O Box: 193, P.C.134, Sultanate of Oman	Tel: 00968 2448 2391	Fax: 00968 2448 5855	Email: inspec_muscat@intertek.com			
Registered Office	33-37 Athol Street, Douglas, IM1, 1LB, Isle of Man. Company Number 010728V.						
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intertek.com

Form No.: IN-OPF-04 Rev. 13E Dtd. 20-03-2019

LIQUID PENETRANT EXAMINATION REPORT

Report No.:	AD / 53574	Date:	09.03.2020	Page:	1 Of 1
Client :	SHAMS POWER COMPANY	Job No. :			
Location :	MADINAT ZAYED	Item :	PIPE		
Material :	INCONEL	Ref / Procedure No. :	INS/ASME/B31.3/PT/001		
Thickness :	VARIOUS	Revision :	06		
Surface condition :	AS WELDED & CLEANED	Test Temp. :	AMBIENT (23°)		
Viewing condition :	DAY LIGHT (>1076 LUX)	Penetrant Type / Technique :	VISIBLE SOLVENT REMOVABLE		
Penetrant dwell time :	10 MIN	Dev. Time:	10 MIN		
Date of test :	09.03.2020	ACCP - Criteria :	ASME B31.3		
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% PT WAS CARRIED OUT ON THE BUTTERING LAYERS WELD JOINTS.

EQUIPMENT :- BOOSTER HEATER - 1

LINE NO :- R1LBA01

JOINT NO :- CT021,CT022,CT025,CT026,CT014,CT015,CT017,CT019,CT020,CT016.

PROJECT :- SHAMS OUTAGE MARCH -2020

NO RELEVANT INDICATION WAS OBSERVED DURING THE TIME OF INSPECTION.

FOUND ACCEPTABLE AS PER THE SPECIFICATION.

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

REPORT FORMAT APPLICABLE ONLY FOR AUH & FUJ FACILITY



CLIENT REP

AI / TPI

Name :	Name :	Name :	
Sign :	Sign :	Sign :	
Date :	Date :	Date :	
Dubai Branch Sharjah Branch Abu Dhabi Branch Fujairah Branch Oman Branch Registered Office	Tel: 04 3241955 Tel: 06 5061300 Tel: 02 6225820 Tel: 09 2238754 Tel: 00968 2448 2391 Tel: 00968 2448 5855	Fax: 04 3241957 Fax: 06 5361173 Fax: 02 6225830 Fax: 09 2238754 Fax: 00968 2448 5855	Email: inspec_dxbcoor@intertek.com Email: inspec_shjcoor@intertek.com Email: inspec_adhcoor@intertek.com Email: inspec_fujcoor@intertek.com Email: inspec_muscat@intertek.com

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Form No.: IN-OPF-04 Rev. 13E Dtd. 20-03-2019

LIQUID PENETRANT EXAMINATION REPORT

Report No.:	AD / 53576	Date:	09.03.2020	Page: 1 Of 1
Client :	SHAMS POWER COMPANY	Job No. :		
Location :	MADINAT ZAYED	Item :	PIPING	
Material :	SS	Ref / Procedure No.:	INS/ASME/B31.3/PT/001	
Thickness :	VARIOUS	Revision :	06	
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 :	09.03.2020	ACCP - Criteria :	ASME B31.3	
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 TANK TO PIPE WELD JOINTS.
EQUIPMENT NAME :-LUBE OIL TANK
LUBE OIL (01MAV14-BR010) - 6" JOINT -1NOS
CONTROL OIL STEAM TURBINE (01MAX14AA011) - 2" JOINT-1NOS

PROJECT :- SHAMS OUTAGE MARCH -2020

NO RELEVANT INDICATION WAS OBSERVED DURING THE TIME OF INSPECTION.

FOUND ACCEPTABLE AS PER THE SPECIFICATION.

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

REPORT FORMAT APPLICABLE ONLY FOR AUH & FUJ FACILITY

LEVEL II TECHNICIAN	
Name :	VINEETH.P.
Sign :	
Date :	09.03.2020
Level II No.	L 717
Dubai Branch	1 P.O Box 34053, Dubai, U.A.E
Sharjah Branch	P.O Box 41127, Sharjah, U.A.E
Abu Dhabi Branch	P.O Box 41127, Abu Dhabi, U.A.E
Fujairah Branch	P.O Box: 7007, Fujairah, U.A.E
Oman Branch	P.O Box: 194, P.C. 111, Sultanate of Oman
Registered Office	33-37 Athel Street, Douglas, IM1, 1LB, Isle of Man. Company Number 010728V.

CLIENT REP

Name : _____
Sign : _____

Name : _____
Sign : _____
Date : _____

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Name : _____
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Name : _____
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Form No.: IN-OPF-04 Rev. 13E Dtd. 20-03-2019

LIQUID PENETRANT EXAMINATION REPORT

Report No.:	AD / 53577	Date:	09.03.2020	Page:	1 Of 1
Client :	SHAMS POWER COMPANY	Job No. :			
Location :	MADINAT ZAYED	Item :	PIPING		
Material :	CS	Ref / Procedure No. :	INS/ASME/B31.3/PT/001		
Thickness :	VARIOUS	Revision :	06		
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 :	09.03.2020	ACCP - Criteria :	ASME B31.3		
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 PIPING WELD JOINTS.
- # LINE NO :- MOC 296 GAS LINE
- # TOTAL JOINTS :- 29NOS

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 & FUJ FACILITY

LEVEL II TECHNICIAN	
Name :	VINEETH,P
Sign :	
Date :	09.03.2020
Dubai Branch	1 P.O Box 30545, Dubai, U.A.E
Sharjah Branch	1 P.O Box 12277, Sharjah, U.A.E
Abu Dhabi Branch	1 P.O Box 1907, Abu Dhabi, U.A.E
Fujairah Branch	1 P.O Box 1907, Fujairah, U.A.E
Oman Branch	1 P.O Box 103, P.C. 111, Sultanate of Oman
Registered Office	33-37 Athol Street, Douglas, IM1, 1LB, Isle of Man. Company Number 010728V.

CLIENT REP		
Name :		Name :
Sign :		Sign :
Date :		Date :
Tel: 04 3241955	Fax: 04 3241957	Email: inspec_dxbcoor@intertek.com
Tel: 06 5061300	Fax: 06 5361173	Email: inspec_shicoor@intertek.com
Tel: 02 625820	Fax: 02 625830	Email: inspec_adhoc@intertek.com
Tel: 09 2238754	Fax: 09 2238754	Email: inspec_fujcoor@intertek.com
Tel: 00968 2448 2391	Fax: 00968 2448 5855	Email: inspec_muscat@intertek.com

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9/03/2020

DPT :- Booster Heater - I

* Thermocouple Removal area [RILBAOI]
CT021 [Buffeting layers]

CT022 ✓

CT025 ✓

CT026 ✓

CT014 ✓

CT015 ✓

CT017 ✓

CT019 ✓

R. NO. 53577

DPT :- Lube Oil Tank

* Lube oil [OIMAVIA-BRO10]

6" joint [Tank to Pipe-weld] = 1 nos

* Control oil steam Turbine [OIMAK14-AA01]

2" joint [Tank to Pipe-weld] = 1 nos

R. NO. 53576

DPT :- MOC 296 Gas Line

2" joint = 29 nos ✓

R. NO. 53577

VINEETH POULOSE

9/03/2020