

DOCUMENT CATEGORY		DOCUMENT REVIEW STATUS (BY CLIENT)				
(USE "X" MARK) <input type="checkbox"/> APPROVAL <input checked="" type="checkbox"/> REVIEW <input type="checkbox"/> INFORMATION						
<h2 style="margin: 0;">FIREPROOFING LAYOUT</h2>						
<div style="text-align: right; margin-bottom: 10px;"> </div>						
4	18.08.22	ISSUED FOR PMC REVIEW	CSS	RDS	AS	
3	28.07.22	ISSUED FOR PMC REVIEW	CSS	RDS	AS	
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0	04.02.22	ISSUED FOR PMC REVIEW	CSS	RDS	AS	
REV	DATE	DETAILS OF REVISION	PREPARED	CHECKED	APPROVED	
CLIENT	 IndianOil	INDIAN OIL CORPORATION LIMITED PARADIP REFINERY PROJECT PARADIP ODISHA				
CONSULTANT		TECHNIP ENERGIES				
PROJECT	525 TPD STANDBY SRU PROJECT IOCL PARADIP REFINERY, ODISHA, INDIA					
ESC	 ENGINEERS INDIA LIMITED <small>(A Govt. of India Undertaking)</small>	ENGINEERS INDIA LIMITED NEW DELHI				
 BHEL Hyderabad	BHEL Hyderabad	NAME	SIGN	DATE		
		DRN	CS SHARMA	CSS	18.08.22	EIL
		CHD	SHANKAR.M		20.08.22	BHEL
DEPT. PE&SD.	CODE 450	APPD	SRIKANTH.G		22.08.22	BHEL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company		TITLE: FIREPROOFING LAYOUT				
		BHEL/EIL DRG/DOC NO. B366-088-81-41-06062				REV
		CUST. DRG/ DOC NO. : 080557C-26899053-CIV-A2001-001				4
		SHT NO. 01		NO. OF SHT. 12		

SULPHURE RECOVERY UNIT										
Unit	EQUIPMENT		Fluid Composition	Maximum Operating temepature	Autoignition Temperature	Whether static equipment is holding Liquid Inventory > 5M3 (Yes/No)	Classification of Fire Potential Equipment as per OISD-164	Fire Exposure Envelope		REMARKS
	TAG	NAME						Horizontal (m)	Vertical (m)	
Furnace/ Heater/ Flue gas cooler										
SRU	088-F-001	Reaction Furnace Burner	H2S & NH3, Fuel gas	1427	260*	These equipments fall under a category of fired heater so considered fire potential equipment as per OISD	High	9.1	12.2	* As per PMC Comment, H2S Autoignition temperature(most stringent) is given here as mixer AIT is not available
SRU	088-F-002	Reaction Furnace	H2S, Fuel gas	1427	260*		High	9.1	12.2	
TGTU	090-F-001	Incinerator Burner	H2S, Fuel gas	788	260*		High	9.1	12.2	
TGTU	090-F-002	Incinerator	H2S, Fuel gas	788	260*		High	9.1	12.2	
REACTORS										
SRU	088-R-001	1st Convertor	H2S	283 - 383	260	Equipments Handling gases so inventory calculation not done.Hence not classified Fire Potential Equipment	NO	NA	NA	
SRU	088-R-002	2nd Convertor	H2S	247	260		NO	NA	NA	
VESSELS/ DRUM										
SRU	088-V-001	Acid Gas KO Drum	H2S	48	260	Not required as these are not classified as fire potential equipment	NO	NA	NA	
SRU	088-V-002	SWS Acid Gas KO Drum	H2S & NH3	90	260*		NO	NA	NA	* As per PMC Comment, H2S Autoignition temperature(most stringent) is given here as mixer AIT is not available
SRU	088-V-004	Waste Heat Exchanger Steam Drum	Water	255.7	NA		NO	NA	NA	
SRU	088-V-005	1st Condenser Seal Pot	Liquid sulphur	177	232		NO	NA	NA	
SRU	088-V-006	2nd Condenser Seal Pot	Liquid sulphur	171	232		NO	NA	NA	
SRU	088-V-007	Final Condenser Seal Pot	Liquid sulphur	138	232		NO	NA	NA	
SRU	088-V-008	Degassing Seal Pot	Liquid sulphur	138	232		NO	NA	NA	
SRU	088-V-009	Condensate Drum	Water	100	NA		NO	NA	NA	
SRU	088-V-010	Blowdown Drum	Water	125	NA		NO	NA	NA	
TGTU	090-V-008	Fuel Gas KOD	Fuel Gas	40	537	Yes	Medium	9.1	12.2	
TGTU	090-V-006	Incinerator WHE Steam Drum	Water	255.7	NA	Not required as these are not classified as fire potential equipment	NO	NA	NA	
TGTU	090-V-007	Incinerator WHE Mud Drum	Water	255.7	NA		NO	NA	NA	
HEAT EXCHANGERS										
SRU	088-E-001	Amine Acid Gas Preheater	H2S	221	260	Not required as these are not classified as fire potential equipment	NO	NA	NA	
SRU	088-E-002	Air Preheater	Air	221	NA		NO	NA	NA	
SRU	088-E-003	1st Condenser	H2S	316	260	Flammable liquid hold up inventory is less than 5 M3 so not considered as Fire Potential Equipment	NO	NA	NA	
SRU	088-E-004	1st Reheater	H2S	237	260	Not required as it is not fire potential equipment	NO	NA	NA	
SRU	088-E-005	2nd Condenser	H2S	283 - 338	260	Flammable liquid hold up inventory is less than 5 M3 so not considered as Fire Potential Equipment	NO	NA	NA	
SRU	088-E-006	2nd Reheater	H2S	209	260	Not required as it is not fire potential equipment	NO	NA	NA	
SRU	088-E-007	Final Condenser	H2S	247	260	Flammable liquid hold up inventory is less than 5 M3 so not considered as Fire Potential Equipment	NO	NA	NA	
SRU	088-E-008	BFW Preheater	Water	105	NA	Not required as it is not fire potential equipment	NO	NA	NA	
SRU	088-E-009	Sulphur cooler	Molten sulphur	172	232	Not required as it is not fire potential equipment	NO	NA	NA	
SRU	088-WHB-001	Waste Heat Exchanger 1st Pass	H2S	1327	260	Equipments Handling gases with no liquid hold up so inventory calculation not required.Hence not considered as fire potential equipments	NO	NA	NA	
SRU	088-WHB-002	Waste Heat Exchanger 2nd Pass	H2S	648.9	260		NO	NA	NA	
TGTU	090-WHB-001A/B	Incinerator Waste Heat Exchanger	Flue gas	788	Not Available	Not required as it is not fire potential equipment	NO	NA	NA	

SULPHURE RECOVERY UNIT										
Unit	EQUIPMENT		Fluid Composition	Maximum Operating temepature	Autoignition Temperature	Whether static equipment is holding Liquid Inventory > 5M3 (Yes/No)	Classification of Fire Potential Equipment as per OISD-164	Fire Exposure Envelope		REMARKS
	TAG	NAME						Horizontal (m)	Vertical (m)	
AIR COOLER										
SRU	088-AC-001	Condensate Drum Vent Condenser	Water	101	NA	NA	NO	NA	NA	
SRU	088-AC-002	Blowdown Boiler Cooler	Water	117	NA	NA	NO	NA	NA	
PUMP										
SRU	088-P-001A/B	Acid Gas KOD Pumps	Sour Water	48	NA	NA	NO	NA	NA	
SRU	088-P-002A/B	SWS Acid Gas KOD Pumps	Sour Water	90	NA	NA	NO	NA	NA	
SRU	088-P-004A/B	Degassing Pumps	Molten Sulphur (Some H2S may be there)	176.7	232	NA	NO	NA	NA	
SRU	088-P-005A/B	Sulphur Pit Pumps	Molten sulphur (Some H2S may be there)	172	232	NA	NO	NA	NA	
SRU	088-P-006A/B	Condensate Pumps	Water	100	NA	NA	NO	NA	NA	
SRU	088-P-010A/S	Seal Cooling water sump Pumps	Water	44	NA	NA	NO	NA	NA	
COMPRESSOR, BLOWERS AND EXPANDERS										
SRU	090-K-001A/B	Incinerator Fans	Air	42	NA	NA	NO	NA	NA	
MISCELLANEOUS										
SRU	088-EJ-001A/B	Sulfur Pit Ejectors	Air with max. 500 ppmv H2S and traces of sulphur vapour	138	Not Available	Not required as these are not fire potential equipment	NO	NA	NA	
SRU	088-SU-001	Sulphur Pit	Liquid sulphur	170	232		NO	NA	NA	
SRU	088-C-001	Degassing Contactor	Liquid sulphur with dissolved H2S	138	232		NO	NA	NA	
TGTU	090-SK-001	Incinerator Stack	74.8% Nitrogen, 6.4% water vapour, 3.5% CO2, 3% O2, rest other gases	316	Not Available		NO	NA	NA	
SRU	088-DS-001	Import HP Steam Desupereheater	Steam	400	NA		NO	NA	NA	
TGTU	090-DS-002	Incineartor HP Steam Desupereheater	Water/ Steam	To be provided by Vendor	NA		NO	NA	NA	
SRU	088-A-002	Reaction Furnace TSP Dosing	TSP Solution	Ambient	NA		NO	NA	NA	
TGTU	090-A-002	Incinerator TSP Dosing	TSP Solution	Ambient	NA		NO	NA	NA	

Note-1: Only list of FPE (Fire Potential Equipment) and extent of fire exposure envelope are provided here by Safety dept. based on various criteria's as mentioned in OISD-STD-164 (Fire Proofing of Steel Supporting Structures in Oil & Gas Industry-July, 2012 Edition).

Note-2 Equipment located on Technical structure without blind floor considered as on the grade for extent of fire exposure envelope.

Reference Documents/ Drawings:

- a. Equipment Layout OF SRU Unit (Dwg. No. B366-088-16-43-00001 Rev 0) as provided by Piping dept.
- b. Unit Hazardous Area Source List provided by Process department.

List of Fireproofing members for PR-01

S.No.	North Grid No.	East Grid No.	Type of member	Elevation (TOS)		Remarks
				From	To	
1	PR-01/1	PR-01/B	Column	100.600	109.400	Height of 9.1m from Grade & horizontal radius of 9.1m w.r.t. Fire Potential Equipment 088-F-001 & 088-F-002
2	PR-01/2	PR-01/B	Column	100.600	109.400	
3	PR-01/3	PR-01/B	Column	100.600	109.400	
4	PR-01/4	PR-01/B	Column	100.600	109.400	
5	PR-01/5	PR-01/B	Column	100.600	109.400	
6	PR-01/6	PR-01/B	Column	100.600	109.400	
7	PR-01/7	PR-01/B	Column	100.600	109.400	
8	PR-01/8	PR-01/B	Column	100.600	109.400	
9	PR-01/1-PR-01/2	PR-01/B	Stub-Column	105.000	109.400	
10	PR-01/2-PR-01/3	PR-01/B	Stub-Column	106.500	109.400	
11	PR-01/3-PR-01/4	PR-01/B	Stub-Column	106.500	109.400	
12	PR-01/4-PR-01/5	PR-01/B	Stub-Column	106.500	109.400	
13	PR-01/5-PR-01/6	PR-01/B	Stub-Column	106.500	109.400	
14	PR-01/6-PR-01/7	PR-01/B	Stub-Column	106.500	109.400	
15	PR-01/7-PR-01/8	PR-01/B	Stub-Column	105.000	109.400	
16	PR-01/1	-	Portal Beam	108.000		
17	PR-01/2	-	Portal Beam	108.000		
18	PR-01/3	-	Portal Beam	108.000		
19	PR-01/4	-	Portal Beam	108.000		
20	PR-01/5	-	Portal Beam	108.000		
21	PR-01/6	-	Portal Beam	108.000		
22	PR-01/7	-	Portal Beam	108.000		
23	PR-01/8	-	Portal Beam	108.000		
24	PR-01/1-PR-01/2	-	Intermediate Portal Beam	108.000		
25	PR-01/2-PR-01/3	-	Intermediate Portal Beam	108.000		
26	PR-01/3-PR-01/4	-	Intermediate Portal Beam	108.000		
27	PR-01/4-PR-01/5	-	Intermediate Portal Beam	108.000		
28	PR-01/5-PR-01/6	-	Intermediate Portal Beam	108.000		
29	PR-01/6-PR-01/7	-	Intermediate Portal Beam	108.000		
30	PR-01/7-PR-01/8	-	Intermediate Portal Beam	108.000		
31	PR-01/1-PR-01/2	PR-01/B	Longitudnal Beams	105.000 & 106.500		
32	PR-01/2-PR-01/3	PR-01/B	Longitudnal Beams	105.000 & 106.500		
33	PR-01/3-PR-01/4	PR-01/B	Longitudnal Beams	105.000 & 106.500		
34	PR-01/4-PR-01/5	PR-01/B	Longitudnal Beams	105.000 & 106.500		
35	PR-01/5-PR-01/6	PR-01/B	Longitudnal Beams	105.000 & 106.500		
36	PR-01/6-PR-01/7	PR-01/B	Longitudnal Beams	105.000 & 106.500		
37	PR-01/7-PR-01/8	PR-01/B	Longitudnal Beams	105.000 & 106.500		

Notes:

1. For guidelines of extent of fireproofing refer doc. no. 080557C-26899053-CIV-A0106-001_0-C
2. Vertical & Plan bracings need not to be fireproofed.
3. Non-load bearing stringer beams that run parallel to piping need not be fireproofed.
4. Air fin cooler over PR-01 has been considered as non-fire potential equipment as per Fire Potential Equipment List.

List of Fireproofing members for PR-02

S.No.	North Grid No.	East Grid No.	Type of member	Elevation (TOS)		Remarks
				From	To	
1	PR-02/2	PR-02/A	Column	100.600	109.400	Height of 9.1m from Grade & horizontal radius of 9.10 m w.r.t. Fire Potential Equipment 090-V-008, 090-F-001 & 090-F-002
2	PR-02/3	PR-02/A	Column	100.600	109.400	
3	PR-02/4	PR-02/A	Column	100.600	109.400	
4	PR-02/5	PR-02/A	Column	100.600	109.400	
5	PR-02/3-PR-02/4	PR-02/A	Stub-Column	106.500	109.400	
6	PR-02/4-PR-02/5	PR-02/A	Stub-Column	106.500	109.400	
7	PR-02/4	PR-02/B	Column	100.600	109.400	
8	PR-02/5	PR-02/B	Column	100.600	109.400	
9	PR-02/6	PR-02/B	Column	100.600	109.400	
10	PR-02/4-PR-02/5	PR-02/B	Stub-Column	106.500	109.400	
11	PR-02/5-PR-02/6	PR-02/B	Stub-Column	106.500	109.400	
12	PR-02/2	-	Portal Beam	108.000		
13	PR-02/3	-	Portal Beam	108.000		
14	PR-02/4	-	Portal Beam	108.000		
15	PR-02/5	-	Portal Beam	108.000		
16	PR-02/6	-	Portal Beam	108.000		
17	PR-02/3-PR-02/4	-	Intermediate Portal Beam	108.000		
18	PR-02/4-PR-02/5	-	Intermediate Portal Beam	108.000		
19	PR-02/5-PR-02/6	-	Intermediate Portal Beam	108.000		
20	PR-02/1-PR-02/2	PR-02/A	Longitudnal Beams	103.700 & 106.500		
21	PR-02/2-PR-02/3	PR-02/A	Longitudnal Beams	103.700 & 106.500		
22	PR-02/3-PR-02/4	PR-02/A	Longitudnal Beams	103.700 & 106.500		
23	PR-02/4-PR-02/5	PR-02/A	Longitudnal Beams	103.700 & 106.500		
24	PR-02/4-PR-02/5	PR-02/B	Longitudnal Beams	103.700 & 106.500		
25	PR-02/5-PR-02/6	PR-02/B	Longitudnal Beams	103.700 & 106.500		

Notes:








1. For guidelines of extent of fireproofing refer doc. no. 080557C-26899053-CIV-A0106-001_0-C
2. Vertical & Plan bracings need not to be fireproofed.
3. Non-load bearing stringer beams that run parallel to piping need not be fireproofed.
4. Future air fin cooler has been considered as non-fire potential equipment.

List of Fireproofing members for 088-TS-01

S.No.	North Grid No.	East Grid No.	Type of member	Elevation (TOS)		Remarks
				From	To	
1	TS-01/5	TS-01/A	Column	100.600	109.500	Height of 9.1m from Grade & horizontal radius of 9.1m w.r.t. Fire Potential Equipment 088-F-001 & 088-F-002
2	TS-01/6	TS-01/A	Column	100.600	109.500	
3	TS-01/7	TS-01/A	Column	100.600	109.500	
4	TS-01/8	TS-01/A	Column	100.600	109.500	
5	TS-01/9	TS-01/A	Column	100.600	103.100	
6	SS-01/1	SS-01/A	Column	100.600	109.500	
7	SS-01/2	SS-01/A	Column	100.600	109.500	
8	SS-01/1	SS-01/B	Column	100.600	109.500	
9	SS-01/2	SS-01/B	Column	100.600	109.500	
10	TS-01/5 - TS-01/6	TS-01/A	Longitudnal Beams	104.475, 107.000 & 109.130		
11	TS-01/6 - TS-01/7	TS-01/A	Longitudnal Beams	103.100 & 107.000		
12	TS-01/7 - TS-01/8	TS-01/A	Portal Beam	103.100, 107.000 & 109.500		
13	TS-01/8 - TS-01/9	TS-01/A	Portal Beam	103.100		
14	TS-01/7	TS-01/A - TS-01/B	Longitudnal Beams	103.100 & 107.000		
15	TS-01/8	TS-01/A - TS-01/B	Longitudnal Beams	103.100, 105.500 & 108.000		
16	TS-01/9	TS-01/A - TS-01/B	Longitudnal Beams	103.100		
17	SS-01/1	TS-01/A - SS-01/B	Longitudnal Beams	109.500		
18	SS-01/2	TS-01/A - SS-01/B	Longitudnal Beams	109.500		
19	SS-01/1 - SS-01/2	SS-01/A	Portal Beam	103.500, 106.500 & 109.500		
20	SS-01/1 - SS-01/2	SS-01/B	Portal Beam	103.500, 106.500 & 109.500		
21	SS-01/1	SS-01/A - SS-01/B	Longitudnal Beams	103.500, 106.500 & 109.500		
22	SS-01/2	SS-01/A - SS-01/B	Longitudnal Beams	103.500, 106.500 & 109.500		

Notes:

1. For guidelines of extent of fireproofing refer doc. no. 080557C-26899053-CIV-A0106-001_0-C
2. Vertical & Plan bracings need not to be fireproofed.
3. Non-load bearing stringer beams that run parallel to piping need not be fireproofed.

DOCUMENT CATEGORY		DOCUMENT REVIEW STATUS (BY CLIENT)				
(USE "X" MARK)\ <input checked="" type="checkbox"/> APPROVAL <input type="checkbox"/> REVIEW <input type="checkbox"/> INFORMATION						
<h1>GUIDELINE FOR EXTENT OF FIREPROOFING FOR STEEL STRUCTURES</h1>						
						
1	18.08.22	ISSUED FOR PMC APPROVAL	CSS	RDS	AS	
0	02.07.21	ISSUED FOR COMMENTS	CSS	RDS	AS	
REV	DATE	DETAILS OF REVISION	PREPARED	CHECKED	APPROVED	
CLIENT	 IndianOil	INDIAN OIL CORPORATION LIMITED PARADIP REFINERY PROJECT PARADIP ODISHA				
CONSULTANT			TECHNIP ENERGIES			
PROJECT	525 TPD STANDBY SRU PROJECT IOCL PARADIP REFINERY, ODISHA, INDIA					
ESC	 ENGINEERS INDIA LIMITED NEW DELHI					
 DEPT. PE&SD.	BHEL Hyderabad		NAME	SIGN	DATE	
		DRN	CS SHARMA	CSS	18.08.22	EIL
		CHD				
		APPD				
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company		TITLE: FIREPROOFING PHILOSOPHY (STRUCTURAL)				
		BHEL/EIL DRG/DOC NO. B366-088-81-41-46061				REV
		CUST. DRG/ DOC NO. : 080557C-26899053-CIV-A0106-001				1
		SHT NO. 01	NO. OF SHT. 5			

GUIDELINE FOR EXTENT OF FIRE PROOFING FOR STEEL STRUCTURES

परियोजना : स्टैंड बाइ एसआरयू परियोजना , पारादीप रिफ़ाइनरी
PROJECT : **STANDBY SRU PROJECT, PARADIP REFINERY**

मालिक : मे. इंडियन ऑइल कॉर्पोरेशन लिमिटेड
OWNER : **M/S INDIAN OIL CORPORATION LIMITED**

पीएमसी : मे. टेक्निप एनेर्जीस
PMC : **M/s TECHNIP ENERGIES**

ग्राहक : मे. भारत हैवि एलेक्ट्रिकल्स लिमिटेड
CLIENT : **M/s BHARAT HEAVY ELECTRICALS LTD.**

1	18.08.2022	ISSUED FOR APPROVAL	CSS	RDS	AS
0	02.07.2021	ISSUED FOR COMMENTS	CSS	RDS	AS
Rev. No	Date	Purpose	Prepared	Checked	Approved

1.0 SCOPE

This guide covers the fire proofing for the structures in complex. It has been largely based on the OISD-STD-164.

The materials and their application shall be as per Job specification no. 080557C-000-JSS-1800-003. Fire proofing details shall be as per General Civil Standards doc. no. 080557C-000-LD-1790-001

2.0 FIRE PROOFING INSIDE A HYDROCARBON PROCESS UNIT:

For all the steel stanchion or supports requiring resistance against mechanical damage at the lower end, fire proofing shall be made of reinforced cement concrete. The height of such fire proofing shall be a minimum of 1.8 M from the grade level.

At higher levels vermiculite fireproofing material shall be used.

2.1 PROCESS COLUMNS AND VESSEL SKIRTS:

- a) Exterior surface of skirt to be fire proofed for all equipments.
- b) Interior surface need not be fire proofed if there is only one manhole and its diameter is not greater than 600mm. Other openings may be closed by removable steel plates at least 6.4mm thick.

2.2 LEG / LUG SUPPORTS FOR VESSELS:

Legs or lugs supporting vessel or lugs used for re-boilers etc. shall be fire proofed.

2.3 SUPPORTS FOR HORIZONTAL EXCHANGERS, COOLERS CONDENSERS, DRUMS RECEIVERS AND ACCUMULATORS:

Fire proofing shall be provided for steel saddles that support horizontal equipments that have diameter greater than 760mm and the vertical distance between the shell bottom and the top of grout exceeds 460mm.

2.4 FIRED HEATERS:

The legs shall be fire proofed up to the point where the steel columns are welded to the steel floor plate of the firebox.

2.5 PIPERACKS WITHIN UNITS:

The sequential requirement of fire proofing of pipe racks is as follows:

- a) When a pipe rack is within a fire exposed envelope, fireproofing shall be used for all vertical and horizontal supports up to and including the first level.

- b) If a pipe rack carried piping handling hydrocarbon that has a diameter greater than 6 inches at levels above the first horizontal beam or hydrocarbon pumps are installed beneath the rack, fireproofing shall be provided up to and including the level that is nearest to a 9.1 m elevation. Wind or earthquake bracing and non-load bearing stringer beams that run parallel to piping need not be fireproofed.
- c) If air fin-fan coolers are installed on top of the pipe rack, fire proofing shall be used for all vertical and horizontal support members on all levels of the pipe rack including support members for the air fin-fan coolers, regardless of their elevation above grade.
- d) Fireproofing shall be provided for Knee and diagonal bracing that contribute to the support of vertical loads. Knee and diagonal bracing that is used only for wind or earthquake need not be fireproofed.
- e) A fireproofed catch beam or bracket shall be given beneath larger piping (greater than 6 inches) that is supported by exposed steel spring hangers and rods. Sufficient clearance should be provided between the bracket or beam and the pipe to permit free movement.

2.6 TECHNOLOGICAL STRUCTURES:

- a) When structure support fire potential equipment, fireproofing shall be used for the vertical and horizontal steel support members from the grade up to the highest level at which the equipment is supported.
- b) Elevated floors and platforms that could retain significant quantities of liquid hydrocarbons shall be treated as though they were on the ground floor level, for the purposes of calculating vertical distances for fireproofing.
- c) For structure supporting non-fire potential equipment, fire proofing shall be provided for the vertical and horizontal steel members from grade up to and including the level that is nearest to a 9.1m elevation above grade if the collapse of unprotected structure supports could result in substantial damage that would involve nearby fire-potential equipment.
- d) Fireproofing shall be used for Knee and diagonal bracing that contribute to the support of vertical loads or to the horizontal stability of columns if it is located within the fire-exposed envelope. Knee and diagonal bracing that is used only for wind, earthquake, or surge loading need not be fireproofed.
- e) When reactors, towers, or similar vessels are installed on protected steel or reinforced concrete structure, fireproofing material shall be used for protection of supporting steel brackets, lugs or skirts. Because of the size and importance of the large vessels such as reactors, regenerators, and vacuum towers that are mounted on high support structures, fireproofing should be provided for the entire exposed support system regardless of its height.

- f) Except for the upper surface of the top flange, fireproofing shall be provided for beams that support equipment in fire exposed area.
- g) The earthing lugs shall be kept clear of the fire protection.
- h) Air fin-fan coolers shall be considered in the same manner as included in the clause for pipe racks.

2.7 AUXILIARY PIPE SUPPORTS PLACED OUTSIDE THE PIPE RACK:

- a) Supports for all pipes with diameter greater than 6 inches and level less than 9.1m shall be fire proofed.
- b) Supports for Pipes less than or equal to 6 inch in diameter and level less than 9.1m shall be fire proofed in the high-pressure lines.
- c) Structures around Reactors, Compressor houses and vessel platforms shall not be fire proofed. Accordingly, the pipes supported from the same, up to a level of 9.1 m, shall not be greater than 6 inches in diameter. In case there are pipes greater than 6 inches in diameter, independent supports shall be provided and these supports shall be duly fire proofed.
- d) Important hydrocarbon lines such as relief lines, blow down lines or pump suction lines from accumulators or columns, less than or equal to 6-inch diameter, shall be identified for fire proofing. Unless specifically ruled out, fire proofing shall be provided for all hydrocarbon lines within a height of 9.1m

3.0 FIRE PROOFING OUTSIDE THE PROCESSING UNITS:

The fire proofing norms outside the process units are governed by the location specific conditions.

3.1 PIPE RACK:

- a) Pipe racks in off-sites which is not fire proofed shall not have any open drain (that may contain oil waste or receive accidental spills) within 30 feet or the drain may be covered.
- b) All pipe racks shall be fire proofed within 9.1m horizontally from a source of liquid fuel.



3.2 FLARE TRESTLES:

Governing criteria is same as the pipe rack in off sites.

इंजीनियर्स
इंडिया लिमिटेड

(प्रायतः सरकार का उपक्रम)

ENGINEERS
INDIA LIMITED

(A Govt. of India Undertaking)

PROJECT: 525 TPD STANDBY SRU PROJECT IOCL PARADIP REFINERY, ODISHA, INDIA

CUSTOMER: M/S INDIAN OIL CORPORATION LIMITED PARADIP REFINERY PROJECT, PARADIP, ODISHA

CONSULTANT : M/S TECHNIP ENERGIES

CLIENT: M/S BHARAT HEAVY ELECTRICALS LIMITED

ESC: M/S ENGINEERS INDIA LIMITED

COMMENTS RESOLUTION SHEET (CRS)

Subject: FIREPROOFING LAYOUT

Date: 18.08.2022

Sl No.	Page No.	Document Name / No.	Clause No.	PMC Observations	EIL Response	Remarks
1	Page-2	080557C-26899053-CIV-A2001-001_3	-	PL INCREASE THE LINE WEIGHT OF THE HATCH FOR BETTER READABILITY	Noted and updated as required.	
2	Page-12	080557C-26899053-CIV-A2001-001_3	-	9.1M pl update in the original document also.	Noted and updated as required.	