



DETAILS OF PRESTIGIOUS ORDERS

Client Name (Project)	M/s. IOCL Panipat Refinery (PREP)	1
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Contract Reference (Our job ref.) PJ/CC/PREP/T-055/LOA dated 03.12.2003 (J-5325)
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Scope of Work / Supply Project Management, Design, Detailed Engineering, Procurement, Manufacture, Supply, Transportation, Storage, Fabrication, Construction, Installation, Testing, Pre-commissioning and commissioning of HC Flare Stack system for Panipat Refinery Expansion Project of M/s. IOCL
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Governing Technical Parameters	
Peak Flow Rate	773920 kg/hr
Mol. Weight	29.2
Temperature	211.8° C
Smokeless Flare load	25000 kg/hr
Total Pre. Drop	4500 mm WC

Overall Flare Height	100M
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Technical Description of Major Equipments (Scope involved)		
Item (Model no.)	MOC	Size (Description)
Flare Tip (FUS 64/36 CB)	Incolloy 825	64 inch x 3m lg.
Molecular Seal (AFS 64)	SS 316L	3.7m dia. x 6.7m lg.
Stack Riser	SA672 Gr.70 CL 22	62 inch x ~75m lg.
Water Seal Drum	SA516 Gr.70	68" Inlet / 62"Outlet / 6.63m dia. x 14mm thk.
Flare Gas Header	SA516 Gr.70	68" x 110 m lg.
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 8" NB for overall length of ~100m including insulation, steam tracing, steam traps, hose stations etc.
Derrick Structure	CS/MS	For overall flare height of 100 m
Header Trestle & other supports for Plant Utility Piping	CS/MS	
Davit Arrangement	CS/MS	
Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 4 pilots		
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		



Client Name (Project)	M/s. IOCL Panipat Refinery (Px-PTA)	2
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Contract Reference (Our job ref.)
PJ/CC/PX-PTA/T-063/LOA dated 12.02.2004 (J-5338)

Scope of Work / Supply
Project Management, Design, Detailed Engineering, Procurement, Manufacture, Supply, Transportation, Storage, Fabrication, Construction, Installation, Testing, Pre-commissioning and commissioning of HC, Sour & Biogas Flare systems for Integrated Px-PTA Project of M/s. IOCL

Governing Technical Parameters			
Parameters	HC FLARE	BIOGAS FLARE	SOUR FLARE
Peak Flow Rate	839300 / 792491 kg/hr	920 kg/hr	23500 / 27000 kg/hr
Mol. Weight	106.5 / 98.5	20.3 / 25.9	25 / 30.9
Temperature	185 / 187 °C	80° C	150 / 60 °C
Smokeless Flare load	25200 kg/hr	---	---
Total Pre. Drop	4500 mm WC	400 mm WC	1870 mm WC

Overall Flare Height	107M
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Technical Description of Major Equipments (Scope involved)		
Item (Model no.)	MOC	Size (Description)
HC Flare Tip (FUS 42/56 CB)	Incolloy 825	42 inch x 3m lg.
HC Molecular Seal (AFS 48)	SS 316L	2.7m dia. x 5.6m lg.
HC Stack Riser	SA672 Gr.70 CL 12	48 inch x ~80m lg.
Water Seal Drum	SA516 Gr.70	58" Inlet / 48"Outlet / 4.9m dia. x 12mm thk.
Biogas Flare Tip (FNS 6)	Incolloy 825	6 inch x 3m lg. (with Integral Gaseel IGS 6)
Biogas Stack Riser	SS 304L	6 inch x ~100m lg.
Sour Flare Tip (FN 14)	Inconel 625	14 inch x 3m lg. (with Integral Gaseel IGS 14)
Sour Stack Riser	SS 304	16 inch x ~100m lg.
HC Flare Gas Header	SA516 Gr.70	58" x 75 m lg.
Biogas Flare Header	SS 304L	6" x 75 m lg.
Sour Flare Gas Header	A358 TP304 Cl.1	16" x 55 m lg.
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 8" NB for overall length of ~100m including insulation, steam tracing, steam traps, hose stations etc.
Common Derrick Structure	CS/MS	For overall flare height of 107 m
Header Trestle & other supports for Plant Utility Piping	CS/MS	
Common Davit Arrangement	CS/MS	For all (HC, Bio & Sour) flare tips
Common Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 8 pilots		
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		



Client Name (Project)	M/s. HPCL Mumbai Refinery (GFECP)	3
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Contract Reference (Our job ref.)
5000240-OQ-48009 dated 19.07.2005 (J-5466)
6000212-OQ-48009 dated 10.07.2006 (J-5557)

Scope of Work / Supply
Design, engineering, procurement, manufacture & supply of Flare Stack Components for Green Fuel & Emission Control (GFEC) project of M/s. HPCL Mumbai.
Flare Stack & associated works for GFEC Project of HPCL Mumbai.
Project Management, Procurement, Transportation, Storage, Fabrication, Construction, Installation, Testing, Pre-commissioning and commissioning of Flare Stack & associated works for Green Fuel & Emission Control (GFEC) Project of M/s. HPCL Mumbai; which involves: Mechanical works, Static Equipment, & Structural works

Governing Technical Parameters		
Parameters	HC FLARE	SOUR FLARE
Peak Flow Rate	619100 kg/hr	13610 kg/hr
Mol. Weight	67.05	18.5
Temperature	125 °C	118 °C
Smokeless Flare load	20,000 kg/hr	---
Total Pre. Drop	1000 mm WC (tip + seal)	500 mm WC (tip & seal)

Overall Flare Height	110M
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Technical Description of Major Equipments (Scope involved)		
Item (Model no.)	MOC	Size (Description)
HC Flare Tip (FUS 46/28 CB)	Incolloy 825	46 inch x 3m lg.
HC Molecular Seal (AFS 60)	SA516 Gr.60	3.7m dia. x 6.7m lg.
Sour Flare Tip (FN 12/18 CB)	Inconel 625	12 inch x 3m lg. (with Integral Gaseel IGS 12)
Common Davit Arrangement	CS/MS	For both (HC & Sour) flare tips
HC Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 4 pilots		
Sour Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 3 pilots		
Loose Instruments & Thermocouple Cables		
Water seal drum - 5.43m dia. (Supplied by others)		
HC Flare Gas Header	SA516 Gr.70	60 inch x ~100m lg. – 12mm thk.
Sour Flare Gas Header	SS 304	18 inch x ~50m lg.
Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1” NB to 12” NB for overall length of ~100 to 300m including insulation, steam tracing, steam traps, hose stations etc.
Derrick Structure	CS/MS	For overall flare height of 110 m (180MT)
Header Trestle & other supports for Plant Utility Piping	CS/MS	



Client Name (Project)	M/s. HPCL Visakh Refinery (VRCFP)	4
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Contract Reference (Our job ref.)
5000434-OW-46009 dated 17.10.2005 (J-5476)
5000729/OW/460009 dated 11.03.2006 (J-5514)

Scope of Work / Supply
Design, engineering, procurement, manufacture & supply of Flare Stack Components for Visakh Refinery Clean Fuel (VRCF) Project of M/s. HPCL Vizag
Project Management, Procurement, Transportation, Storage, Fabrication, Construction, Installation, Testing, Pre-commissioning and commissioning of Flare system & associated work for Visakh Refinery Clean Fuel (VRCF) project of M/s. HPCL, Vizag; which involves: Civil & Structural works, Mechanical works, Static & Rotating Equipment, Electrical works, Instrumentation works

Governing Technical Parameters		
Parameters	HC FLARE	SOUR FLARE
Peak Flow Rate	490500 kg/hr	16500 kg/hr
Mol. Weight	26.7	18.0
Temperature	165 °C	170 °C
Smokeless Flare load	50000 kg/hr	---
Total Pre. Drop	2000 mm WC (tip + seal)	1000 mm WC (tip & seal)

Overall Flare Height	80M
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Technical Description of Major Equipments (Scope involved)		
Item (Model no.)	MOC	Size (Description)
HC Flare Tip (FUS 44/70)	Inconel 625	44 inch x 3m lg.
HC Molecular Seal (AFS 60)	SS 316L	3.7m dia. x 6.7m lg.
Sour Flare Tip (FN 14)	Inconel 625	14 inch x 3m lg. (with Integral Gaseel IGS 14)
Common Davit Arrangement	CS/MS	For both (HC & Sour) flare tips
Common Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 7 pilots		
Loose Instruments & Thermocouple Cables		
Water seal drum & Knock out drums (Supplied by others)		
HC Stack Riser	SA516 Gr.70	60 inch x ~50m lg. – 12mm thk.
Sour Stack Riser	SS 304	14 inch x ~50m lg.
HC Flare Gas Header	SA516 Gr.70	60" x 325 m lg./ 54" x 125 m lg./ 42" x 70 m lg.
Sour Flare Gas Header	SS 314L	14" x 150 m lg.
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 12" NB for overall length of ~100 to 300m including insulation, steam tracing, steam traps, hose stations etc.
Derrick Structure	CS/MS	For overall flare height of 80 m (200MT)
Header Trestle & other supports for Plant Utility Piping	CS/MS	
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		



Client Name (Project)	M/s. NAFTOGAZ India Pvt. Ltd. (PNCP – EPCC9)	5
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Contract Reference (Our job ref.)	
NGH-6556/EPCC9-PED-PR-0001-01 dated 02.12.2006 (J-5611)	NGH-6556/EPCC9-PED-PR-0001-01 dated 02.12.2006 (J-5612)

Scope of Work / Supply	
Design, Engineering and Supply of all items of Flare Systems for Balance Offsite & Utilities and Interconnection with Panipat Refinery Marketing Terminal for IOCL's Panipat Naphtha Cracker Project (PNCP): EPCC9	Erection, Installation, Testing & Pre-commissioning of Flare Systems for Balance Offsite & Utilities and Interconnection with Panipat Refinery Marketing Terminal for IOCL's Panipat Naphtha Cracker Project (PNCP): EPCC9

Governing Technical Parameters			
Parameters	NCU HC FLARE	Polymer HC + MEG FLARE	LP HC FLARE
Peak Flow Rate	1070503 kg/hr	1041900 kg/hr (MEG: 950 kg/hr)	8000 kg/hr
Mol. Weight	27.5	57.8 (MEG: 22.9)	32
Temperature	41.7 °C	223° C (MEG: 42° C)	-10 °C to 40 °C
Smokeless Flare load	180000 kg/hr	40000 kg/hr	8000 kg/hr
Total Pre. Drop	5146 mm WC	4000 mm WC	270 mm WC
Overall Flare Height	119M	130M	20M

Technical Description of Major Equipments (Scope involved)		
➤ NCU HC FLARE PACKAGE		
Item (Model no.)	MOC	Size (Description)
Flare Tip (FUS 60/80 CB)	Incolloy 800H	60 inch x 3m lg.
Molecular Seal (AFS 60)	SS 316L	3.5m dia. x 6.6m lg.
Stack Riser	SA516 Gr.70	72 inch x ~100m lg. – 8mm thk.
Water Seal Drum	SA516 Gr.70	72" Inlet / 72"Outlet / 6.642m ID x 14mm thk.
Flare Gas Header	A672 Gr.B60 CL.12	72" x ~90 m lg./ 54" x ~25 m lg
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 24" NB for overall length of ~100m including insulation, steam tracing, steam traps, hose stations etc.
Derrick Structure	CS/MS	For overall flare height of 119 m
Header Trestle & other supports for Plant Utility Piping	CS/MS	
Fuel Gas K O Drum	SA516 Gr.70	6" Inlet / 6"Outlet / 1m dia. x 8mm thk.
Davit Arrangement	CS/MS	
Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 4 pilots		
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		



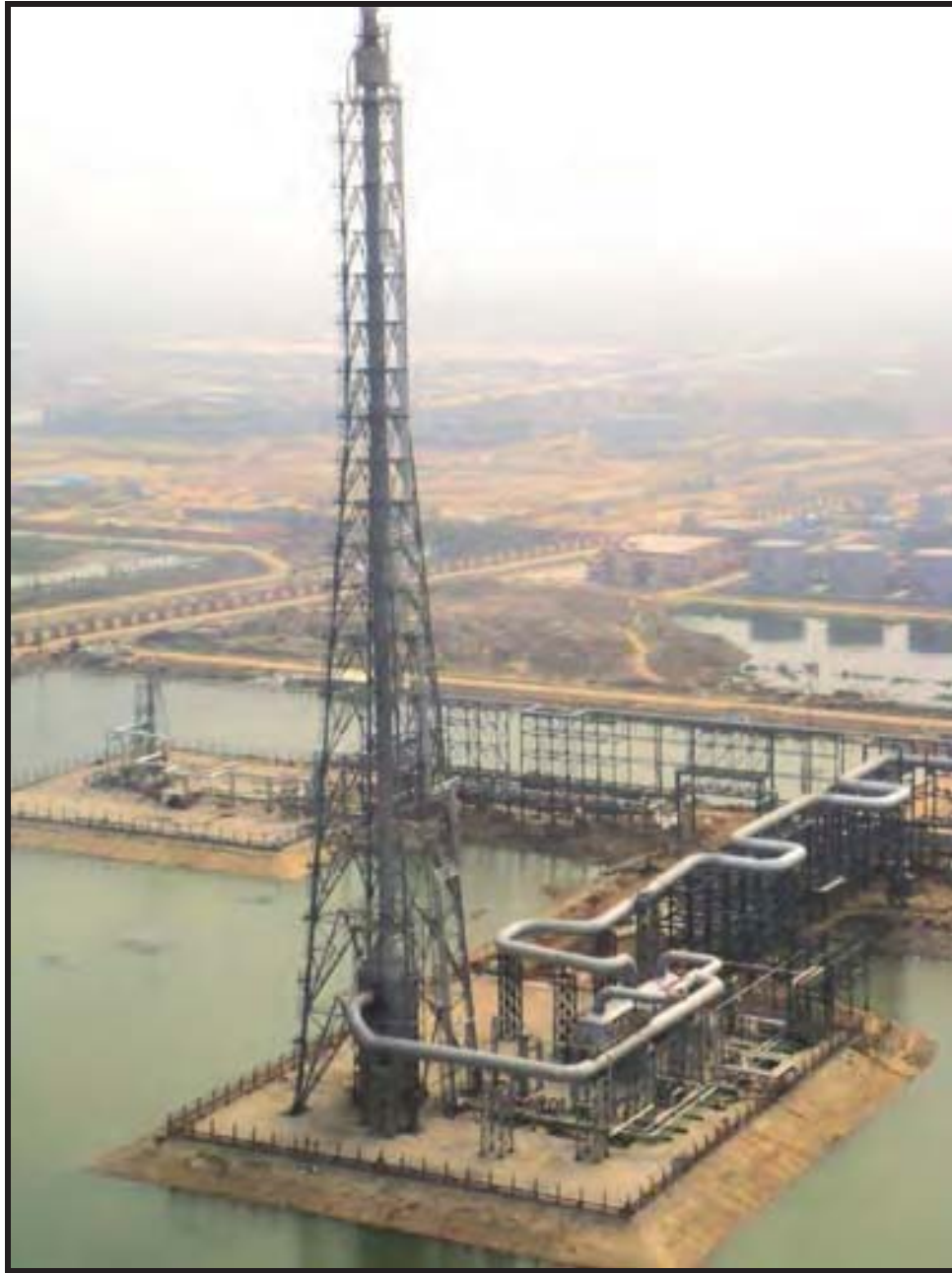
➤ Polymer HC + MEG FLARE PACKAGE		
Item (Model no.)	MOC	Size (Description)
Flare Tip (FUS 60/42 CB)	Incolloy 800H	60 inch x 3m lg.
Molecular Seal (AFS 60)	SS 316L	3.5m dia. x 6.6m lg.
Stack Riser	SA516 Gr.70	76 inch x ~110m lg. – 10mm thk.
MEG Stack Riser	A106 Gr.B	6 inch x ~130m lg. – 10mm thk.
Water Seal Drum	SA516 Gr.70	76" Inlet / 76"Outlet / 7.0222m ID x 14mm thk.
MEG Water Seal Drum	SA516 Gr.70	6" Inlet / 6"Outlet / 1.184m ID x 8mm thk.
Flare Gas Header	A672 Gr.B60 CL.12	76" x ~90 m lg./ 56" x ~25 m lg
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 18" NB for overall length of ~100m including insulation, steam tracing, steam traps, hose stations as required
Derrick Structure	CS/MS	For overall flare height of 130 m
Header Trestle & other supports for Plant Utility Piping	CS/MS	
Fuel Gas K O Drum	SA516 Gr.70	6" Inlet / 6"Outlet / 1m dia. x 8mm thk.
Davit Arrangement	CS/MS	
Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 4 pilots		
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		
➤ LP HC FLARE PACKAGE		
Item (Model no.)	MOC	Size (Description)
Flare Tip (FUS 12/16 CB)	Incolloy 800H	12 inch x 3m lg. (with Integral Gaseel IGS 12)
Stack Riser	API 5L Gr.B	24 inch x ~17m lg.
Water Seal Drum	SA516 Gr.70	24" Inlet / 24"Outlet / 1.184m ID x 8mm thk.
Flare Gas Header	API 5L Gr.B	24" x ~90 m lg.
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 4" NB for overall length of ~100m including insulation, steam tracing, steam traps, hose stations as required
Derrick Structure	CS/MS	For overall flare height of 20 m
Header Trestle & other supports for Plant Utility Piping	CS/MS	
Fuel Gas K O Drum	SA516 Gr.70	6" Inlet / 6"Outlet / 1m dia. x 8mm thk.
Davit Arrangement	CS/MS	
Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 3 pilots		
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		



Flares in operation: 76" dia. X 130m Polymer+MEG Flare in front side AND 72" dia. x 119m NCU HC + Sour Flares in back side at IOCL Panipat Refinery, PNCP (EPCC-9)



**Erection (In-progress) of 72" dia. x 119m NCU HC Flare at IOCL Panipat Refinery,
Panipat Naphtha Cracker Project (EPCC-9)**



**Polymer HC Flare (76" dia. x 130m high) at IOCL Panipat Refinery,
Panipat Naphtha Cracker Project (EPCC-9)**



**LP HC Flare (24" dia. x 20m high) at IOCL Panipat Refinery,
Panipat Naphtha Cracker Project (EPCC-9)**



Client Name (Project)	M/s. ONGC Mangalore Petrochemicals Limited (MARC)	6
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Contract Reference (Our job ref.)
LOA no.: OMPL/5230 dated 04.08.2011 (J-6052)

Scope of Work / Supply
Design, Engineering, Manufacturing, Testing, Inspection, Supply, Erection & Commissioning of Flare Stack for MANGALORE AROMATICS COMPLEX project at Mangalore

Governing Technical Parameters		
Parameters	Case 1	Case 2
Peak Flow Rate	1505516 kg/hr	1431012 kg/hr
Mol. Weight	109	63
Temperature	262 °C	193 °C
Smokeless Flare load	7,500 kg/hr	7,500 kg/hr
Total Pre. Drop	3500 mm WC	3500 mm WC

Overall Flare Height	122.5 M
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Technical Description of Major Equipments (Scope involved)		
Item (Model no.)	MOC	Size (Description)
➤ Supply, Installation & Commissioning of:		
Flare Tip (FC 70 CB)	Incolloy 825	70 inch x 3m lg.
Molecular Seal (AFS 70)	SS 316L	3.97m dia. x 8.37m lg.
Flare Stack Riser	SA516 Gr.70	72 inch x ~100m lg. – 10mm thk.
Water Seal Drum	SA516 Gr.70	66" Inlet / 72"Outlet / 3.800m ID x 12mm thk.
Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from 1" NB to 6" NB for overall length of ~320m including insulation, steam tracing, steam traps, hose stations etc.
Derrick Structure	CS/MS	For overall flare height of 122.5 m
Supports for Plant Utility Piping	CS/MS	
Fuel Gas K O Drum	SA516 Gr.70	6" Inlet / 6"Outlet / 1m dia. x 8mm thk.
Davit Arrangement	CS/MS	
Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 4 pilots		
Loose Instruments & Thermocouple Cables		