

# COMPANY PROFILE



## **Airoil Flaregas Private Limited**

**(An ISO 9001-2008/ ISO 14001-2004 accredited  
and  
ASME 'U' & 'PP' Stamps certified)**

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**AIROIL FLAREGAS** Private Limited



ISO 9001:2008 ISO 14001:2004  
FM 548440 EMS 548441

## **ANNEXURE – 1**

**INTRODUCTION ABOUT OURSELVES**



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## INTRODUCTION ABOUT OURSELVES

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**AIROIL FLAREGAS PVT. LIMITED, an ISO 9001-2008/ ISO 14001-2004 accredited**, was established in 1984, as a joint venture company with Airoil Flaregas Ltd of the UK. The British Company was acquired by Hamworthy Combustion Engineering Ltd., UK in 1993. Hamworthy Combustion was acquired by Koch Industries USA in the year 2011 and since then, Airoil Flaregas in India became an independent Company.

Airoil Flaregas offers complete design, manufacturing, installation and commissioning services for flare system for Refinery, Petrochemical, Fertilizers, Steel Plants, Oil & Gas station and allied Chemical Industries.

With over twenty-five years of design & manufacturing expertise, coupled with excellent Project Management capabilities and customer relations, Airoil Flaregas today is a true leader in the combustion engineering industry.

Airoil Flaregas is a part of the HS Group of Companies, which has been serving the Engineering Industry for three decades with total dedication & commitment.

We are pleased to highlight our turnkey capabilities for the flare system & other mechanical contracts. In 1984, we started the business activity as designer and manufacturer of only the critical components for the flare system. We had very fruitful experience of working on various projects where we were involved in the supply of flare components for Refineries, Petrochemical, Fertilizers, Steel Plants, Oil & Gas station and allied Chemical Industries. With this experience we then ventured into Construction activities for the flare system for different types of industries.

✓ **Single point responsibility**

The design and manufacturing experience is further extended to project management and turnkey contract execution with single point responsibility right from concept to commissioning for the flare system requirement.



✓ **Cost & Time savings with Better Execution Control**

On opting for turnkey flare package apart from the cost economics, the other benefit lies in the terms of time savings & better execution control as the total responsibilities lies at a single point that to with the vendor who is technically qualified and aware of the total system requirement. We all are well aware of the problems associated in construction jobs involving multiple agencies on a single work where at times in case of delay or facing a problem precious time and energy is wasted in communication and fault findings. Due to these facts we emphasize on getting more & more involved on turnkey packages.

Review of our Reference list would reveal the details of our vast experience. Till today we have executed around 50 turnkey projects.

Further, We are pleased to highlight that we had been fortunate to get ourselves associated on various prestigious projects on the turnkey flare contracts, which also includes:

- Panipat Refinery Expansion Project (**PREP**) of M/s. IOCL Panipat refinery
- Para-Xylene (**PX**) / Purified Terephthalic Acid (**PTA**) - PXPTA project of M/s. IOCL Panipat refinery
- Green Fuel & Emission Control (**GFEC**) project of M/s. HPCL Mumbai
- Visakh Refinery Clean Fuel (**VRCF**) project of M/s. HPCL Vizag
- Panipat Naptha Cracker Project (**PNCP**), EPCC-9 of M/s. IOCL Panipat refinery
- Stage Flare project for existing BX Flare at IOCL Barauni refinery
- Flare Unit (S-102) for 525 MTPD Methanol Project of M/s. GSFC, Vadodara, Project-8400
- Flare System for Toluene Di-Isocyanate (TDI) Plant of M/s. GNFC Dahej
- Flare System for Ethyl Acetate Project of M/s. GNFC Bharuch
- Process Gas Flare & Ammonia Flares for Ammonia Plant Feedstock Changeover Projects of NFL, Panipat Plant & Bhatinda Plant
- Flare Stack for Mangalore Aromatics Complex (MARC) project of M/s. OMPL Mangalore



A list of other major projects includes:

- 70000 TPA ISO Propyl Alcohol Project of M/s. Deepak Fertilisers and Petrochemicals Corp. Ltd.
- Ammonia-V Technology Upgradation Project of M/s. RCFL, Trombay, Mumbai
- The 130T RHD-TOP Unit at M/s. Jindal Vijayanagar Steel Limited, Tornagallu
- Upgradation of EPS to GGS – Agartala Dome Project of M/s. ONGC, Assam
- Upgradation of Baramura GCS Project of M/s. ONGC, Assam
- New 300 TPD Methanol Distillation Unit (MDU) Project of M/s. GNFC Bharuch
- DHDT project of M/s. BRPL Assam
- Offsites for TCI Sanmar Chemicals, Egypt
- Propylene Recovery Unit of M/s BPCL Kochi refinery
- Flare Stack System for Expansion of GCS Olpad project of M/s. ONGC
- Capacity Expansion cum Modernisation Project, Phase-II (CEMP-PH-II) of M/s BPCL Kochi refinery
- Flare Stack Components for Diesel Quality Upgradation Project (DQUP) of M/s. Numaligarh Refinery Ltd.
- Supply & Installation of Flare Package for Amine Treatment Unit for NCU of M/s. IOCL at Panipat
- Flare Stack Components for Guru Gobind Singh Refinery Project, Bathinda of M/s. HPCL-Mittal Energy Ltd. (HMEL)
- MRPL – III project of M/s. MRPL, Mangalore
- IPPL Propane/ Butane / LPG Import Terminal project at Ennore
- LT Flare system with Demountable derrick for M/s. IOCL Paradeep refinery

Please also refer the enclosed Flare Reference List of more details.



## BOARD OF DIRECTORS

<b>HASU C SHETH</b>	
➤ Founder Partner	• The HS Group of Comapnies
➤ Chairman	• Airoil Flaregas Pvt. Ltd • TLT Engineering India Pvt. Ltd
➤ Partner	• HS Engineeirng & Marketing Services
➤ Director	• Horizon Polymer Engineering Pvt. Ltd
<b>PETER J ANDRADE</b>	
➤ Founder	• The HS Group of Comapnies
➤ Managing Director	• Horizon Polymer Engineering Pvt. Ltd
➤ Partner	• HS Engineeirng & Marketing Services
➤ Director	• Airoil Flaregas Pvt. Ltd • TLT Engineering India Pvt. Ltd
<b>GAUTAM H SHETH</b>	
➤ Managing Director	• Airoil Flaregas Pvt. Ltd • TLT Engineering India Pvt. Ltd
➤ Partner	• HS Engineering & Marketing Services
<b>D C CHHEDA</b>	
➤ Finance Director	• Airoil Flaregas Pvt. Ltd • TLT Engineering India Pvt. Ltd
<b>MITESH SANGHAVI</b>	
➤ Director	• TLT Engineering India Pvt. Ltd



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## **HS GROUP COMPANIES**

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### **1. M/s. H. S. ENGINEERING & MARKETING SERVICES**

A professionally managed marketing organization representing in India more than 30 leading manufacturers from U.K., U.S.A. and Japan catering to the requirements of the Fertilizer, Refineries, Chemical, Petrochemical, Power and Oil Exploration Application.

### **2. M/s. TLT ENGINEERING INDIA PVT. LIMITED**

Leading engineering company with ISO:9001:2000, is a joint venture with a **Turbo Lufttechnik Germany** and involved in the designing, engineering & manufacturing of Industrial Fans and Silencers.

### **3. M/s. HORIZON POLYMER ENGINEERING PVT. LIMITED**

Manufacturers of Teflon (PTFE/PFA), Kynar (PVDF) and Polypropylene (PP) lined pipes, fittings, ball valves, expansion bellows and sight flow indicators in technical collaboration with a well known British House.





**AIROIL FLAREGAS** Private Limited



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**ANNEXURE – 2**  
**FLARE REFERENCE LIST**

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
1	4005	1985	NFL-Vijaipur	PDIL	Elevated Flare Components (Steam Assisted), Knock Out Drum, Flarex Seal
2	4018	1985	IOCL - Mathura	EIL	Elevated flare components FUS Type 32" Steam assisted Flare Tip (with integral Gas seal)
3	4034	1986	IFFCO - Aonla	PDIL	Elevated Flare components including (1) 36" Steam Assisted Flare tip (2) Knock Out Drum (3) Flarex Seal (4) Control Panel (5) DIP leg liquid seal. Note : Control Panel was supplied by AF-Italy
4	4039	1986	ONGC - Hazira	EIL	Ground Flare components. Ground Flare supplied by AF, UK. Control Panel supplied by AF, Italy. Completed piping supplied by AFIL.
5	4044 *	1986	FACT	FEDO	70 Mtr Self Supported flare system including flare tip type PHP - Flarex Seal, Dip leg liquid seal and control panel on completed <b>Turnkey</b> basis including site erection and commissioning.
6	4068 *	1987	Assam Petrochemicals	H & G	16" Flare tip with water seal. Self Supported flare stack for an overall height of 30 Mtr low water seal. Job executed on total <b>Turnkey</b> basis including site erection and commissioning.
7	4081	1987	Degreemont Indian Ltd		Biogas Flare, Flare tip type FN 4" (Non-smokeless) with a manual simple and effective ignition system "Triboliter" using flints.
8	4082	1987	Degreemont Indian Ltd		Biogas Flare, Flare tip type FN 4" (Non-smokeless) with a manual simple and effective ignition system "Triboliter" using flints.
9	4085	1987	Degreemont Indian Ltd		Biogas Flare, Flare tip type FN 4" (Non-smokeless) with a manual simple and effective ignition system "Triboliter" using flints.
10	4123 *	1988	Bhansali Engg & Polymers	ICB	Flare system - Stack and base water seal on completed <b>Turnkey</b> basis
11	4130 *	1989	GNFC - Bharuch	FEDO	Flare system (1) 38" Flarex Seal (2) 36" Flare tip with 55 Mtr height self supported stack (3) Water seal (4) Knock Out Drum - 2 Nos (5) Ignition Panel on completed <b>Turnkey</b> basis
12	4133 *	1989	Lubrizol India Ltd	DPG	Flare System - 6" Flare tip with Derrick Supported stack of 27 Mtr with base water seal on completed <b>Turnkey</b> basis
13	4135	1989	Gujarat Carbon	H & G	Flare tip with Integral Gas seal and ignition panel
14	4142 *	1989	Kothari Sugars	H & G	Flare system - 10" Flare tip base water seal and 37 Mtr high Derrick Supported stack on completed <b>Turnkey</b> basis.
15	4151 *	1989	CETEX Petrochemicals	DPG	Flare system - FN 24 CB Flare tip, FXA 24 Flarex Seal, Water Seal, FFG panel and self supported stack for 36M height. Job executed on total <b>Turnkey</b> basis including site erection and commissioning.
16	4171 *	1989	R.C.F		Complete Flare System. The job executed on total Turnkey basis including site erection and commissioning.
17	4180 *	1989	R.C.F. Thal	ICB	FC 12 CB, FXA 12, Triboliter Manual non-electric type natural draft ignition system, Derrick of 45 M. The job executed on total <b>Turnkey</b> basis including site erection and Commissioning
18	4195	1990	IOCL/GHP	EIL	Three Flare tips FUS 44/20 & Two FN 12 CB, forced draft electric type ignition Davit
19	4197	1990	ONGC- Gandhar	EIL	FN 24 CB, Forced Draft electric type Ignition system Davit
20	4198	1990	ONGC - Rewa	EIL	FN 24 CB, Forced Draft electric type Ignition system Davit

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
21	4203	1990	Amit Alcohol		FNS 4, Triboliter Manual Natural Draft Ignition system
22	4206	1990	Lubrizol (I) Ltd	DCL	FN 12 CB, Automatic electric Ignition
23	4209 *	1990	Gujarat Apar Polymers Ltd	Dalal	FN 10, IGS 10, Electric Manul Natural Draft Ignition Panel, Water Seal, 8" Inlet Knock Out Drum 8" Outlet Derrick Structure. Job executed on total <b>Turnkey</b> basis including site erection and commissioning.
24	4215 *	1990	Andhra Petrochemicals	DPG	H.P. Flare FN 24 CB, FXA 24, 24" Inlet Water Seal, Riser 24" Dia of 31 Mtrs L.P. Flare FUS 10/8, FXA 10, Riser 10" Dia of 11 Mtrs. Both Flare, Derrick supported, Manual Natural Draft Ignition panel. The Job executed on total <b>Turnkey</b> basis including site erection and commis
25	4227	1990	Degremont India Ltd		3 Nos of Biogas Flare tip and assemblies etc.
26	4230	1990	ONGC - Tatipaka	EIL	Flare tip and Integral Gas Seal, FFG, Davit etc
27	4235	1991	CFCL	Toyo	Ammonia Flare tip FNS 6, Flarex Seal, FFG, Spares etc
28	4237	1991	Bridge & Roof		3 Nos of Biogas Flare tip and ignition
29	4238	1991	Herdillia Polymers Ltd	DPG	1 No. Flare Tip, FC 14 CB, IGS FFG Water seal, Derrick Riser etc.
30	4249	1991	IOCL- Digboi	EIL	1 No. Flare tip, Flarex Seal, FFG Ignition Panel, Retractable Davit
31	4258 *	1991	India Tube Mills Ltd/IFFCO - Kalol		1 No Flare tip FNS 6 CB, IGS, FFG, Riser, Derrick Etc. The job executed on total <b>Turnkey</b> basis including site erection and commissioning
32	4259	1991	GAIL	EIL	1 No. Flare Tip, flarex Seal, FFG
33	4272	1991	L & T/Finolex		1 No. Air Blown Flare tip - FAB 16, FFG Panel, Blower, Motor, Actuator etc.
34	4276 77 *	1991	CFCL	TEIL	1 No. flare tip FNS 18, FXA 18, FFG system, FUS 36/18, FXA 36, FFG ssystem Riser, KOD, Derrick, Spares etc. The jobs executed on total <b>Turnkey</b> basis including site erection and commissioning.
35	4269	1991	IOCL, Barauni	EIL	Flare tip, Flarex Seal, FFg & Davit
36	4293	1992	MRL	EIL	1 No. Flare Tip FUS 36/18 CB, FFG, Retractable Davit and Spares.
37	4304 *	1992	Tata, Babrala	TCL	1 No. Flare Tips FNS 20, FXA 20, FFG, System FUS 40/18, FXA 40, Riser, KOD, Water Seal Derrick, Spares etc. The job executed on total <b>Turnkey</b> basis including site erection and commissioning.
38	4308	1992	Transpek Industries		1 No. Flare tip FNS 4, Riser, KOD, FFG System
39	4310	1992	BACL	PDIL	1 No. Flare Tip, FC 36, FXA 36, Riser, KOD, FFG System, Derrick, Spares etc.
40	4318	1992	IFFCO - Phulpur	PDIL	1 No. Flare Tip, FNS 6, FFG Panel, Spares etc.
41	4328	1992	TATA Ferti/ Kaveri Engg	PDIL	1 No. Flare tip FNS 8, FFG Panel, Spares etc.
42	4330	1992	ONGC, Uran	EIL	1 No. Flare tip FUS 42/21 CB FXA 42 Flarex seal
43	4340	1992	R.S. Builders & Engrs	Toyo	1 No. Flare tip FNS 6, FXA 8, FFG Panel, Spares etc.
44	4366	1993	Visveswaraya Iron & Steel ltd	OTTO	1 No. Flare tip FN 40 CB with IGS 40, FFG Panel (manual - FD - Electric - Seq) Etc
45	4372	1993	Kothari Sugars Ltd		FNS 6, Flare tip, FFG Panel, (Manual ND Electric), Flame Arrestor & TC Cable
46	4376	1993	Chemicals & Plastics India Ltd		2 Nos FNS 6 Flare tip, 2 No FFG Panelm, (Manual ND Electric), Flame Arrestor & TC Cable

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
47	4380	1993	Hindustan Nitro Products Gujarat Ltd		1 No. of FC Flare tip, FFG Panel (FD Manual Electric ) & Water Seal
48	4382	1993	EIL/GAIL - Lakwa	EIL	FN 24 Flare tip, Flarex Seal FXA 24 FFG Panel (FD Manual Electric), Davit and Thermocouple Cable
49	4387 *	1993	Thiru Arooran Sugars Ltd, Madras		FNS 6, Flare Tip, Flame Arrestor, FFG Panel, Thermocouple Cable. Completed on <b>Turnkey</b> basis.
50	4397	1993	Lubrizol India Ltd		FN 24 CB, flare tip, FFG Panel, (Auto- Manual), Flarex Seal FXA 24 and Thermocouple Cable
51	4403 & 4407 *	1993	SPIC Ltd		LPG Flare system, FN 10 CB, FXA 12 Riser with stack Base, common Derrick Structure, FFG Panel (Manual) and Thermocouple Cable. The job executed on total <b>Turnkey</b> basis including site erection and commissioning.
52	4421	1993	Lubrizol	Mecon	FN 8 Flare tip with IGS 8, Automatic FFG Ignition Panel and TC Cable
53	4433	1994	ONGC Hazira		FUS 60/60 CB Flare Tip with Pilot Burners
54	4435	1994	SPIC Pharma	SPIC-SMO	FNS 2 Flare tip, FFG Panel, Flame Arrestor
55	4440 *	1994	Sakthi Sugars		02 Nos of FNS 4 Flare tip, 1 No. FNS6 Flare Tip and 3 Nos of FFG Panels. Completed on <b>Turnkey</b> basis.
56	4442 *	1994	Aouthern Agri Furane Industries Ltd	SPIC-SMO	FNS3 Flare Tip, FFG Panel, Riser, Flame Arrestor, T/C Cable and utility piping. Completed on <b>Turnkey</b> basis.
57	4450	1994	Shakthi Sugar		FNS6 Flaretip & Ignition Panel
58	4451	1994	Shakthi Sugar		FNS 4 Flare tip & ignition Panel
59	4455	1994	MRPL	EIL	FC 54 CB Flare tip, FXA 54, FFG Panel, Steam Control Valve, Davit and TC Cable.
60	4456	1994	Lloyds Steel Industries - ONGC/Gandhar	EIL	FUS 36/18 CB, Flare Tip, FXA 40, FFG Panel & Davit
61	4483 *	1994	Sakthi Sugars		FNS 4 Flare Tip with ignition Panel completed on <b>Turnkey</b> basis
62	4484	1994	Otto India RSP Modernisation	M.N.Dastur	2 Nos of FNS 48 Flare Tips and 2 Nos of FFG Ignition Panel
63	4513	1994	EID Parry Nellikuppam		Biogas Flare FNS2
64	4533	1995	FACT	FEDO	FNS 36 CB Tip, FXA 36 Flarex Seal, Riser KOD Cum Water Seal, Utility Piping, TC Cable, FUS 12/24 CB Tip, FXA 12 Seal Riser, KOD Cum Water Seal, Utility Piping, TC Cable, Common Derrick, Common FFG Panel, ACW lights, Davit, Foundation Bolts, Header piping
65	4534 *	1995	FACT	FEDO	Erection and commissioning of Flare System excuted on total <b>Turnkey</b> basis
66	4543 4544 *	1995	FACT	FEDO	FNS 8 with IGS8, Riser, Derrick Structure, FFG Panel, Utility piping, Purge Control Station, TC Cable & ACE lights. The job executed on total <b>Turnkey</b> basis.
67	4566	1995	NFL-Vijaipur	PDIL	FUS 52/24 CB Tip, AFS 52 Seal, K.O.Drum 1.75 M Dia/3.7 M Dia, FFG Panel, TC Cable and Spares
68	4569	1995	IFFCO- Aonla	PDIL	FUS 52/24 CB Tip, AFS 52 Seal, K.O.Drum 1.75 M Dia/3.7 M Dia, FFG Panel, TC Cable and Spares
69	4594	1995	NFCL-Kakinada	DCL	Flare Tips (FUS 36 & FNS 18), Flarex Seals (FXA 18 & FXA 36), Risers (36" & 18"), K.O.Drums, FFG Panel, Utility Piping, T/C Cable, Derrick Structure.

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
70	4595 *	1995	NFCL-Kakinada	DCL	Erection and commissioning of Flare System. The job executed on total <b>Turnkey</b> basis.
71	4620 *	1995	GSFC - Baroda	ICB	Riser (36" & 28"), K.O.Drum, Derrick Structure, ACW Lights & erection. The job executed on total <b>Turnkey</b> basis including site erection and commissioning (100 M Ht. Flare)
72	4628	1996	MFL - Madras	FEDO	FUS 12/24 CB Flare Tip, FXA 12 Flarex Seal, K.O.Drum Cum Water Seal, FFG Panel, Utility Piping, T/C Cable & Derrick Structure.
73	4629 *	1996	MFL - Madras	FEDO	Erection and commissioning of Flare System. The job executed on total <b>Turnkey</b> basis.
74	4630	1996	Amaravati Sugars		FNS 6 Flare tip, Riser, FFG Panel, Derrick Structure, FFG Panel
75	4641 *	1996	Salem Co-operative Sugars		FNS 6 Flare tip, Riser, FFG Panel, Derrick Structure, FFG Panel completed on <b>Turnkey</b> basis
76	4672	1996	IFFCO-Phulpur	PDIL	FUS 52/24 CB Tip, Molecular Seal AFS 52, K.O.Drum (02 Nos), FFG Panel, T/C Cable.
77	4700	1996	HPCL - Visakh	EIL	Flare tip FUS 56/36 CB & Acid Gas tips with IGS, Flarex Seal AFS 60, Auto/Manual electric FD FFG Panel, Davit assembly, TC Cable, Steam Control Valve and spares
78	4701	1996	Nirma Ltd	UHDE	Flare Tip FN 52 CB, Flare tip FUS 8/10 with integral Gas seal, Flarex seal AFS 52, Retractable Davit, Water seal Knock Out Drum, Aircraft Warning Light and flow measuring instrument and Spares.
79	4714	1997	Uhde India Ltd/ Coramandal Fertiliser Ltd	UHDE	Flare Tip FNS 4 + IGS 4, FD Electric FFG manual panel, Utility piping and spares.
80	4716	1997	Thai Organics Chemicals Co. Ltd	H & G	Flare Tip FUS 10/8 + IGS 10, 12" NB Riser, KOD Cum Water Seal, FD Manual FFG Panel, Utility piping, TC Cable, Derrick Structure, Steam Control station, Davit and Spares.
81	4718	1997	GNFC - Bharuch	H & G	Flare Tip FN 16 CB, AFS 20 Flarex Seal Water Seal Drum, K.O.Drum, FD manual, FFG Panel, Purge Control KIT & Spares.
82	4733	1997	Hindustan Agies LPG Boitteling Co. Ltd		Flare Tip FN 10, Forced draft manual FFG Panel and Spares
83	4744	1997	IFFCO Aonla		Naphtha K.O.Drum and Accessories including two years spares.
84	4745A *	1997	ONGC Balol GGS IV	TPPL	Flare Tip 18/22, Flarex Seal AFS 18, Water Seal, K.O.Drum, FFG Panel, T/C Davit Assembly, Derrick Structure, Riser, Utility piping, site erection and commissioning on <b>Turnkey</b> basis.
	4745B *	1997	ONGC North Santhal	TPPL	Flare Tip 28/42, Flarex Seal AFS 18, Water Seal, K.O.Drum, FFG Panel T/C, Davit Assembly, Derrick Structure, Riser, Utility piping, site erection and commissioning on <b>Turnkey</b> basis.
	4745C *	1997	ONGC South Santhal	TPPL	Flare Tip 28/42, Flarex Seal AFS 18, Water Seal, K.O.Drum, FFG Panel T/C, Davit Assembly, Derrick Structure, Riser, Utility piping, site erection and commissioning on <b>Turnkey</b> basis.
85	4756	1997	Bechtel Singapore		Flare Stack Riser, Molecular Seal, Tip, FFG ignition Panel, Commissioning of Spares, Spares for 2 years operation.
86	4761	1997	IPCL, Gandhar	EIL	Flare Tip, Molecular Seal
87	4786	1997	BPCL	EIL	Flare Tip FN 16
88	4787	1997	IOCL, Guwahati	EIL	Flare Tip, Molecular Seal, FFG Panel

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
89	4780 *	1997	CFCL	Toyo	Flare tip, Molecular Seal, FFG Panel, KOD, Riser, Derrick, Utility Piping & Aircraft Warning light. The job executed on total <b>Turnkey</b> basis including site erection and commissioning.
90	4781	1997	CFCL	Toyo	Site Erection and Commissioning
91	4791 *	1997	MRPL	EIL	Flare tip, Molecular Seal, FFG panel, Riser, Derrick, Davit, Aircraft Warning light. The job executed on total <b>Turnkey</b> basis including site erection and commissioning (100 M Ht. Flare)
92	4810	1998	EIL/Haldia Petro	EIL	Flare tip FUS 64/70 CB, TCC (750M), Molecular Seal AFS 74, FFG Panel, Davit with accessories, Self Actuated Pressure control valve, Pressure Switch, Steam Control Valve, Restriction Orifice Plate & Spares (commissioning & 2 years)
93	4822	1998	Essar Projects	EIL	Flare Stack Components, Flare Tip (FUS 42/48 CB), FN 18 CN Flare tip, FUS 24/20 CN Flare Tip, AFS 50 Flare Seal, AFS 24 Flares Seal, FFG Panel (2 Nos), Davit (2 Nos)
94	4827	1998	Daelim Engg. Co. Ltd	EIL	Flare Stack components, Flare Tip (FN 16), Flare Stack (16") Spares (Mandatory, commissioning & 2 years)
95	4834	1998	Gujarat Chemicals Port Terminal Co. Ltd	EIL	Flare Stack Components, Flare Tip, FFG Panel, Davit and TCC, Spares
96	4835	1998	Madras Refineries Ltd	EIL	Flare tip (FN-14/IGS 14") - 2 Nos
97	4837	1998	SPIC - Dubai		Flare System - Flare Tip (FN30 CB), Flare Stack, Flare Tip (FNS 40 IGS 20), Flare tip (FNS 4 IGS), Molecular Seal, 3 Nos Riser, Derrick Structure, FFG Panel, ACW Lights, Utility piping.
98	4848	1998	Oswal	Toyo	Flare System - FNS 8 with IGS, FFG Panel, T.C.Cable, Riser, Foundation Bolt, Utility lines, Spares, Design & Engineering for Derrick Structure
99	4855	1998	ONGC Hazira		Flare tip FHP 30
100	4862	1998	IPCL	EIL	Flare Tip FN 2, Flame Arrestor
101	4866 *	1998	BPCL	EIL	Flare Turnkey job, Supply of FUS 42/21 tip, AFS 42 Molecular Seal, Riser, FFG Panel, K.O.Drum, Water Seal Drum, Derrick, All instrument & electrical items etc. The job executed on total <b>Turnkey</b> basis including site erection and commissioning (100 M ht. Flare)
102	4954	1999	Pearl Distillery		Biogas Flare - Flare Tip FN 6, FFG Panel
103	4955	1999	Stewarts & Lloyds	Lloyds	Flare Stack components - Flare Tip FN 16, P.M.Box, TC Cable etc
104	4968	1999	GAIL	EIL	Flare Stack components - Flare Tip FUS 34/15, Flare Seal AFS 34, Davit, FFG panel etc.
105	4986 *	1999	IPPL, Haldia	Toyo	Flare Turnkey job, supply of Flare Tip FN 12 CB, Molecular Seal AFS 16, 14" Riser with stack base, FFG Panel, Derrick (60M), Anchor Bolts, Utility piping, LPG manifold and TC Cables. The job executed/under execution on total <b>Turnkey</b> basis.
	4987	1999	IPPL, Haldia	Toyo	Erection and Commissioning
106	4988	1999	SCSL, Dahej	Toyo	Supply of Flare Tip FNS 8", Molecular Seal AFS 6, Riser 6", FFG Panel, Utility piping, Thermocouple Cable & Anchor bolts
	4989	1999	SCSL, Dahej	Toyo	Design and Engineering
107	5022	2000	L&T/IOCL Barauni	EIL/TPPL	Design and supply of HC Flare tip, Sour Flare Tip, K.O.Drum, FFG Panel, Davit, Instruments, Spares

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
108	5033	2000	GAIL, Vaghodia	EIL	Flare Stack Components, Flare Tip, FFG Panel, Davit Instruments
109	5037	2000	Zuari/Toyo	Toyo	Flare Stack Components - Flare Tip, Panel etc.
110	5047	2000	CFCL/Toyo	Toyo	Flare Tip
111	5051	2000	Newton/IOCL Dumad	L & T Chiyoda	Flare Stack components - Flare Tip FAB 8/18, FFG Panel, Fan & Motor. Thermocouple Cable, Davit, Instruments & Spares
112	5064	2001	Newton/ONGC Gandhar	TPPL	Engineering and Design of Flare Stack components
113	5065	2001	Newton/ONGC Gandhar	TPPL	Flare Stack Components - Flare Tip FaB 20/8) , FFG Ignition Panel, Davit with Ground winch, Fan, Thermocouple Cable, Utility piping, Aviation light, Instruments, Spares.
114	5070	2001	Paramount Ltd/ONGC Bechraji	JCE	Flare system - Flare tip (FNS 18/12 CB) with integrated Gas seal, FFG Ignition Panel, Thermocouple Cable. Junction box, Davit assembly, ground winch, Water Seal & Knock Out Drum , Aviation light, Utility piping , Spares etc.
115	5074	2001	GAIL, Noida		Flare Tip (FN4CB) with Ignition system, Riser with support arrangement .
116	5100	2001	GAIL Noida		Mobile Flare system - Flare Tip FN 4, Ignition System, Riser, LPG Manifold, Lifting Arrangement, LPG hose, Utility piping & Design and Engineering
117	5105	2001	Cairn Energy		Flare Tip FN 16 CB, FFG Panel & Thermocouple Cable
118	5111	2001	Chennai Petro-Chemical Corpn		Flare Tip FUS 36/18 CB
119	5134	2001	SPIC/ONGC Ramanad		Flare System - Design Engineering, Flare Tip FAB 22, AFS 26, Ground Winch and accessories, FFG Ignition Panel, Fan and Motor, Thermocouple Cable, Aircraft Warning light etc.
120	5158	2002	NICCO Corporation/ ONGC Kuthalam		Flare Stack components- Flare Tip FAB 22, Molecular Seal AFS 24, FFG, Davit with Ground Winch, Fan with Motor , T/C Cable
121	5159	2002	Sai Rama Engg. Enterprises/ ONGC Kovilkallapal		Flare Stack Components - Flare TIP FAB 12, Molecular Seal AFS 14, FFG ignition panel, Davit with ground winch, Fan with motor, T/C Cable
122	5162	2002	India Glycols Ltd		Flare Stack Components- Flare Tip FNS 14, with IGS, ND FFG Panel, T/C Cable, LPG Manifold & Spares
123	5174	2002	Toyo/Petronet LNG Dahej		Flare Stack Components- Flare Tip FN 16, Molecular Seal AFS 16, FD Manual/Electric FFG Panel, Davit assembly, Motorised Ground Winch and Commissioning Spares
124	5190	2002	Sree Metaliks Ltd		Flare Stack Components- Flare Tip FNS 14, with IGS, FD FFG Panel
125	5204	2002	NICCO Corporation/ ONGC Uran	EIL	Flare Tip FUS 48/30 with IGS, HE Ignition System, Local Control Panel, Retraction Mechanism, Thermocouple Cables
126	5207	2002	Bridge & Roof / ONGC Gandhar GGS VII Project	EIL/JCE	Flare Stack Components- Flare Tip FAB 16 with IGS, FD Manual/Electric FFG Panel, Fan with Motor, Thermocouple cable, Utility Piping, Davit with Ground Winch and Commissioning Spares, Design & Engineering
127	5211	2002	The Andhra Sugars Ltd.		Flare Stack Components- Flare Tip FN8 with IGS, FD Manual/Electric FFG Panel, Riser with Stack base, Thermocouple cable, Derrick Structure, Utility Piping, Commissioning & 2 Years Operational Spares, Supervision for Erection & Commissioning

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
128	5226	2002	HFCL Namrup	PDIL	Flare Stack Components- Flare Tip FUS 42/15, Molecular Seal AFS 24, FD Manual/Electric FFG Panel, Riser, Knock Out Drum, Local Control Panel for KOD, Thermocouple cable, Derrick Structure, Utility Piping, Air Craft Warning Lights, Instruments, Civil Foundation material, Piping material, Commissioning & 2 Years Operational Spares
127	5227 *	2002	HFCL Namrup	PDIL	Civil work, Handling, Storage, Erection and Commissioning The job executed/under execution on total Turnkey basis The job executed/under execution on total <b>Turnkey</b> basis
128	5232	2002	Bridge & Roof / ONGC Gandhar GGS VIII Project	EIL/JCE	Flare Stack Components- Flare Tip FAB 10 with IGS, FD Manual/Electric FFG Panel, Fan with Motor, Thermocouple cable, Utility Piping, Davit with Ground Winch and Commissioning Spares, Design & Engineering
129	5238	2003	Uhde India Ltd/ Sanjana Cryogenic Storages.Haldia	UHDE	Flare Stack Components: FNS 4 with IGS, FD Manual/Electric FFG Panel, Thermocouple Cabels, Commissioning Spares, Supervision for Erection & Commissioning
130	5245	2003	Grand Prix Fab (P) Ltd. - Delhi		Flare Stack Components: Flare Tip FN 8 with IGS, ND Manual/Electric FFG Panel, Thermocouple Cabels, Retractable Davit Assembly
130	5247	2003	ONGC Rajahmundhry		Flare Stack Components: ND Manual/Electric FFG Panel, Remote Ignition System, Supervision for Erection & Commissioning
131	5255	2003	IPCL Dahej		Flare Tip FUS 60/72 CB
132	5273	2003	Hazira LNG Private Limited	TICB	Flare Stack Components- Flare Tip FN 22 with Integral Gas Seal, FD Manual/Electric FFG Panel, Riser, Thermocouple cable, Derrick Structure, Utility Piping, Air Craft Warning Lights, LPG Manifold Assembly, Lightning Arrestor, Retractable Davit, Commissioning Spares
133	5283	2003	Indian Oil Tanking Limited	Jacobs H&G	Design, Engineering, Supply, Site Erection and Commissioning of HC Flare Tip, HC Molecular Seal, HC Flare Stack Riser, HC Water Seal Drum, HC Knock Out Drum, Acid Gas Fludic Seal, Acid Gas Riser, FFG Panel, Thermocouple cables, Utility Piping, Retractable Davit assembly and Derrick Structure. The job executed/under execution on total <b>Turnkey</b> basis
133	5284 *	2003	Indian Oil Tanking Limited	Jacobs H&G	
134	5305	2003	Anabond	Dalal	Flare Stack Components - Flare Tip FN8 with pilots, Riser 8", FFG Panel, Thermocouple Cable, Utility Piping, Derrick Structure, Water Seal & commissioning spares
135	5313	2003	BPCL Mumbai *		Design, Engineering, Supply, Site erection and commissioning of Flare Tip with integral gas seal, Knock Out Drum, FFG Panel, Pumps, Thermocouple Cable etc
136	5314	2003	VVF Limited		Supply of Molecular Seal, Vent Stack pipe & vent stack Tip
137	5325 *	2003	IOCL - Panipat	EIL	Project Management, Design, detailed engineering, procurement, manufacture, supply, transportation, storage, fabrication, construction, installation, testing, pre-commissioning and commissioning of HC Flare Stack system. The job executed on total <b>Turnkey</b> basis
138	5329	2003	Gas Authority of India Ltd	EIL	Design, Engineering and supply of 3 nos Fixed type emergency flareing system with all accessories & suporting structures, Mobile type emergency flaring system with all accessories and supporting structures.
139	5333	2003	Indus Engineering Co		Supply of Flare Tip FAB 8/6 with integral seal, FFG Panel, Fan & Motor, Thermocouple Cable and davit



**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
140	5338 *	2004	IOCL Panipat	EIL	Project Management, Design, detailed engineering, procurement, manufacture, supply, transportation, storage, fabrication, construction, installation, testing, pre-commissioning and commissioning of HC, Sour & Bio Gas Flare system. The job executed on total <b>Turnkey basis</b>
141	5339 *	2004	Hindustan Petroleum Corporation		Design, Engineering, Supply, Site erection and commissioning of Flare Tip FUS 44/54, Water Seal Drum, Zoom, Dismantling of existing flare tip, Hooking up of pilot gas, modification of WSD internals etc.
143	5419	2005	The Andhra Sugars Ltd.		Design & Engineering of Riser, derrick Structure & Utility Piping, Supply of Flare Tip FN 6, FD FFG Panel & Thermocouple Cables
144	5425 /5426	2005	Technip India Ltd		Design, Engineering, Supply of Flare Tip FN 8 with Velocity Seal, K O Drum, FFG Panel, Thermocouple Cable & Commissioning Spares AND design & engg. of Flare Stack Riser, Utility Piping & Derrick structure
145	5446	2005	Deepak Ferti. & Petro. Ltd.	Toyo	Supply & Erection of Flare system components: Flare tip FUS 22/12 CB, Mol. Seal AFS 24, Stack riser, FFG panel, Derrick, TCC, Utility & Vert. Steam piping incd. Steam control valves
146	5450	2005	IOCL Barauni		Supply of Flare tip FUS 56/24 without Pilot burners & external steam injection assembly
147	5452	2005	IOCL Barauni		Supply of Pilot burners & external steam injection assembly for Flare tip FUS 56/24
148	5454	2005	Rashtriya Chemicals & Fert. Ltd.	PDIL	Supply, manufacturing, assembly, testing, painting, inspection, packing and despatch of Flare system & accessories (Flare tip FN 32 CB, Molecular Seal, Stack riser, Knock Out drum for Process Gas flare unit; Flare tip FNS 20, Molecular seal & Stack riser for Ammonia Gas flare; Common FFG panel, TCC, AWL, Utility piping & Retractable Davit) and Design & Engg. of Derrick structure including Comm. & 2 year operation spares
149	5466	2005	HPCL - Mumbai	EIL	Design, engineering, procurement, manufacture & supply of FUS 46/28 CB HC Flare TIP, FUS 60 HC Molecular seal, Auto/manual HC FFG ignition panel, FN 12/18 CB Sour Flare tip with IGS 12, Auto/manual Sour FFG ignition panel, Steam control valve manifolds, Instruments & valves and Davit for <b>Green Fuel &amp; Emmission Control project</b> of M/s. HPCL Mumbai.
150	5473	2005	IOCL - Haldia		Supply of FUS 54 HC Flare tip, Pilot burners & other components of Sour flare tip and replacement at Haldia site
151	5476	2005	HPCL - Visakh	EIL Chennai	Design, engineering, procurement, manufacture & supply of FUS 44/72 HC Flare TIP, FUS 60 HC Molecular seal, FN 14 Sour Flare tip with IGS 14, Common Auto/manual FFG ignition panel, Steam control valve manifolds, Instruments & valves, Davit and mandatory spares for <b>Visakh Refinery Clean Fuel Project</b> of M/s. HPCL Vizag
152	5478	2005	ONGC - Ankleshwar		Supply & replacement of FUS 40/18 CB Flare tip including commissioning at CPF Gandhar site
153	5484	2005	SPIC Pharma		Supply of FFG panel & TCC
154	5514 *	2005	HPCL - Visakh	EIL	Flare System & associated site work for Visakh Refinery Clean Fuel Project of M/s. HPCL, Vizag.
155	5516	2005	Apar Industries, Valia		Supply of FAB 10/4 Flare tip & parts of FFG ignition panel

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
156	5555	2006	SMS Demag Pvt. Ltd. / Jindal Steel		Exhaust Gas After Burner Components (Flare tip FNS 16/12, FFG Panel & TCC)
157	5556	2006	The Andhra Sugars Ltd.		Supply of Air Assisted Smokeless Flare Tip FAB 8/6 & Fan blowers
158	5557 *	2006	HPCL - Mumbai	EIL	Flare Stack & associated site work for Green Fuel Emission Control Project of M/s. HPCL, Mumbai refinery.
159	5566	2006	IOTL - Mumbai (GGS-I Rd. field of ONGC Assam)		Supply of GROUND FLARE COMPONENTS (Flare burners & associated piping, 4 pilots Auto FD FFG Panel and TCC)
160	5568	2006	MRPL (Phase-2)		Supply of Flare tip FC 64 CB & 2 nos. (additional) pilot burners assy.
161	5574	2006	L & T - Chennai (GGS Agartala Dome of ONGC)		Supply of Flare Tip FAB 24/10, Molecular seal AFS 20, Water Seal Drum, ND FFG Panel, Fan & Motor, Thermocouple Cables and Retractable Davit
162	5575	2006	L & T - Chennai (GCS Baramura of ONGC)		Supply of Flare Tip FAB 16/6, Molecular seal AFS 12, Water Seal Drum, ND FFG Panel, Fan & Motor, Thermocouple Cables and Retractable Davit
163	5577	2006	MRPL (Phase-1)		Supply of Flare tip FC 54
164	5578	2006	NRL Assam		Supply of Flare tip FUS 30/15 CB & Molecular seal drum AFS 30
165	5590	2006	Caltex Gas India Pvt. Ltd.		Supply of Flare tip FN 10, TCC & Flame Front Divertor
166	5608	2006	MRPL (Phase-1)		Supply of Off Gas Flare Tip
167	5611/5612 *	2006	NAFTOGAZ INDIA PVT. LTD / IOCL PANIPAT REF.	TPKTI / EIL	Project Management, Design, detailed engineering, procurement, manufacture, supply, transportation, storage, fabrication, construction, installation, testing, pre-commissioning and commissioning of 3 nos. flare systems (NCU HC Flare system, Polymer HC/MEG Flare system & LP HC Flare system). The job executed/under execution on total <b>Turnkey basis</b>
168	5618	2006	Cairn Energy		Design, Engineering and supply of Mobile type Hot flaring system (Flare tip FN 6) with all accessories and supporting structures.
169	5639	2007	L&T ECC- Chennai (GGS-II Rds. field of ONGC Assam)		Supply of GROUND FLARE COMPONENTS: Flare burners & associated piping, 4 pilots Manual FD FFG Panel, TCC, Water Seal drum & Comm. Spares
170	5651	2007	ESSAR Oil Ltd Jamnagar		Supply of Flare tips: HC Flare tip FUS 42/48 CB, H2S Flare tip FN 18 with IGS 18 & LPG Flare tip FUS 24/20 CB
171	5656	2007	SOPAN Projects	Mecon	Supply of Flare system components: Flare tip FN 8 with IGS 8, Water seal drum, Knock out drum, FD/Manual FFG panel, TCC, Aircraft Warning lights, Retractable Davit and Design & engg. for Flare stack riser, Derrick structure, Flare header & other utility piping
172	5666	2007	BRPL	EIL	Supply of Flare system components: Main Flare tip FUS 34 CB, AFS 36, Sour Flare tip FN 10/12 with IGS 10, FD Auto/manual FFG panels (2 nos.), TCC & other instruments, Common Davit, Mandatory Spares
173	5670	2007	Merchem Ltd		Flare tip FN 3. FD/Manual FFG panel & TCC
174	5679	2007	GNFC - Bharuch	Lurgi	Supply of Flare system components: Flare tip FN 16 CB, AFS 20 Molecular seal, Flare stack riser, Water seal drum, Flare Header, K O drum, Auto/Manual FD FFG panel, TCC with TTs, Utility piping, Aircraft warning lights, Instruments, Spares and D/E for Derrick structure & civil works

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
175	5681	2007	GNFC - Bharuch		Supply of FD/Manual FFG panels (4 pilots & 3 pilots) & Pilot Burners (7 nos.) with Spares
176	5697	2007	Technip KT India Ltd, Noida / HOEL		Supply of HP Flare tip FN 20 CB with IGS 20, LP Flare tip FN 8 with IGS 8, FD/Manual FFG panels (5 pilots), LP Water Seal Drum, TCC, Common Davit, Aircraft Warning Lights & Spares
177	5723	2007	IOCL Panipat ref.		Supply of Cold Flare Stack Tip
178	5754	2008	Technip India Ltd, Chennai / Chemplast Sanmar, Egypt		Supply of Flare tip FAB 16/28, Molecular seal AFS 16, Integral K knock out drum, FD/Auto-Manual FFG panels (4 pilots), Retractable Davit, TCC/JBs, LPG manifold, Air Blowers, Aircraft Warning Lights & Spares
179	5756	2008	BPCL Kochi Refinery (PRU)	EIL	Supply of Flare system components: Flare tip FUS 28/16 CB, AFS 30, FD Auto/manual FFG panels (3 pilots), TCC & other instruments, Common Davit, Aircraft Warning lights & Mandatory Spares
180	5771	2008	Chemplast Sanmar Ltd		Supply of Air blown Flare tip FAB 8/20, Air blowers, TCC with Flame proof PM box and Design & Engineering
181	5802	2008	Department of Atomic Energy / HWP Manuguru		Supply of Non-smokeless Flare tip FN 20 CB - 2 nos. & Spare Pilot Nozzles - 6 nos.
182	5806	2009	Tata Projects Ltd (GCS Olpad, ONGC Ankleshwar)		Supply of Flare tip FN 8, Molecular seal AFS 8, Water Seal Drum, Hori. K O Drum, FD-Manual FFG panels (2 pilots), Retractable Davit, TCC/JBs, Mandatory spares, Comm. Spares, Design & Engg. of Derrick/Riser/ Header/Utility
183	5808	2009	BPCL Kochi Refinery (CEMP PH-II)	EIL Chennai	Supply of Flare Stack Components: Main Flare tip FUS 60/48, Main Seal AFS 60, Sour Flare tip FN 12 with seal IGS 12, Common FD Auto/manual FFG panels (7 pilots), TCC & other instruments, Common Davit, Comm. Spares & Mandatory Spares
184	5812	2009	IOCL Guwahati		Supply of Flare tip FUS 30/15 CB (for replacement)
185	5817	2009	Cairn Energy India Pty Ltd		Supply of Flare Stack Components: FN 10, Stack riser with Guy rope supported arrangement, Utility Piping
186	5833	2009	NRL Assam (DQUP Project)	EIL New Delhi	Supply of Flare Stack Components: Flare tip FUS 36/15 CB, Flare Molecular Seal AFS 34, TCC & other instruments, Retractable Davit assy with Electrical ground winch, Comm. Spares & 2 years op. Spares
187	5836 / 5837 *	2009	IOT Engg. Projects Ltd (IOCL Panipat ref. - NCU PNCP EPCC-9)	EIL New Delhi	Supply & Installation of Flare Package for Amine Treatment Unit: Acid Flare tip FN 18/12 CB with Integral Gaseel IGS 12, Flare Stack riser, Modification of NCU HC FFG panel, TCC & other instruments, Flare header & other piping, Modification of NCU HC Derrick structure & Retractable Davit on <b>Turnkey basis</b>
188	5844	2009	HMEL GGSRL Bathinda project	EIL New Delhi	Supply of Flare Stack Components: HC Flare tip FUS 68/24 CB, HC Flare Seal AFS 76, Sour Gas Flare tip FN 24/32 CB with seal IGS 24, Common FD Auto/manual FFG panels (7 pilots), TCC & other instruments, Common Davit, Comm. Spares & Mandatory Spares
189	5874	2009	IGC / Lavan Oil Refinery Co., IRAN		Supply of Main Flare Systems (2 off) & Acid Flare System Components: Main Flare tips (44 inch), AFS 48 Molecular Seals, Common FD Auto/manual FFG panel (6 pilots) with Propane Manifold, TCCs, Instruments, Retra. Davit, AWLs, Acid Gas Flare tip FN 8 with seal IGS 8, Acid FD Auto/manual FFG panels (2 pilots) with Propane Manifold, TCC, Design & Engg., Comm. Spares & 2 years Spares

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
189	5896	2009	BPCL Mumbai (Uran plant)	UHDE	Supply of Flare tip FN 12, Molecular Seal AFS 14, FD manual FFG panels (3 pilots), TCC & other instruments, Davit & Comm. Spares
190	5900	2009	FOCUS Energy Ltd		Supply of Flare tip FN 8 with IGS 8, Stack riser, Water seal drum, FD manual FFG panels (2 pilots), TCC & other instruments, Guy rope suppt. Arrangement
191	5923 / 5924 *	2010	IOT Infrastructure & Energy Services Ltd (ISPRL, Visag)	Jacobs / EIL	<b>Supply, Erection &amp; Commissioning</b> of Flare System for ISPRL Strategic Storage of Crude Oil Project at Visag: Flare tip FUS 12/9 CB with Integral Gaseel IGS 12, Flare Stack riser, Water Seal Drum, Auto-manual FFG panel (3 pilots), Derrick structure, Retractable Davit, AWLs., Utility Piping, TCC/TTs./JBs & other Instruments
192	5932	2010	IOCL Barauni		Supply of Flare tip FUS 56/24
193	5936	2010	MRPL Phase-III Refinery project	EIL New Delhi	Supply of Flare Stack Components: HC Flare tip FUS 72/36 CB, HC Flare Seal AFS 76, Sour Gas Flare tip FN 24/28 CB with seal IGS 24, Common FD Auto/manual FFG panels (7 pilots), TCC & other instruments, Common Davit, Comm. Spares & Mandatory Spares
194	5938	2010	Coromandel Int. Ltd. AP		Supply of Ammonia Flare tip FNS 12 with IGS 12
195	5942 / 5943 *	2010	GNFC - Bharuch (TDI Dahej project)	IBIC	<b>Supply, Erection &amp; Commissioning</b> of Flare System for TDI Dahej: Flare tip FN 32/24 CB with Integral Gaseel IGS 24, Flare Stack riser, Water Seal Drum, Flare Header, Knock Out Drum, Auto-manual FFG panel (3 pilots), LPG Manifold system, Derrick structure, Retractable Davit, AWLs., Utility Piping, TCC/TTs./JBs, IR Pilot Flame detector & Spares
196	5945	2010	PUNJ Lloyd Ltd. (IPPL Ennore, TN proj)	PL Engg.	Supply of Flare System: Flare tip FAB 20/24, Molecular Seal AFS 22, Flare Stack riser, Air Riser, Auto-manual FFG panel (3 pilots), LPG Manifold system, Derrick structure, Retractable Davit, AWLs., Utility Piping, TCC/TTs./TTs, Air blowers
197	5963	2010	IFFCO Paradeep		Supply of FFG panel (SS)
198	5964 *	2010	GSFC, Vadodara (Methanol proj- 8400)	PDIL Vadodara	<b>Supply, Erection &amp; Commissioning</b> of Flare System: Flare tip FN 24 CB, Molecular Seal AFS 28, Flare Stack riser, K O Drum, Manual FFG panel (3 pilots), Derrick structure, Retractable Davit, AWLs., Utility Piping, TE/TCC & other instruments
199	5968 / 69 *	2010	IOCL Barauni (Stage flares proj)		<b>Supply, Erection &amp; Commissioning</b> of Flare System: Flare tip (FUS) & IGS, Flare Stack riser, Water seal Drum, Flare header, Manual FFG panel (2 pilots), TE/TCC, Utility piping, Derrick structure (strengthening) & 2nd stage Water seal drum modification
200	5989 / 5990 *	2010	GNFC - Bharuch (EA Project)	KBK	<b>Supply, Erection &amp; Commissioning</b> of Flare System for Ethyl Acitrate project: Flare tip FN 18 CB, Molecular seal AFS 20, Flare Stack riser, Water Seal Drum, Manual FFG panel (3 pilots), Derrick structure, Retractable Davit, AWLs., Utility Piping, TCC/TTs./JBs & Spares
201	5994	2010	IOT Infrastructure & Energy Services Ltd (Paradip refinery project)	Jacobs / EIL	<b>Supply of Demountable</b> LT Flare Systems (1 Op. + 1 Stand by): Flare tip FC 24 CB with Integral Gaseel IGS 24, Flare Stack riser, Auto/Manual FFG panel (3 pilots), LPG manifold, Demountable Derrick structure, AWLs., Utility Piping, TCC/TTs./JBs & Spares

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
202	6009	2011	L&T Ltd. (GNFC - Syngas gen. plant flare project)		<b>Supply</b> of Flare Systems components: Flare tip FN 36 CB, Molecular seal AFS 34, Flare Stack riser, Knock Out drum, Manual FFG panel (3 pilots), TCC/TTs/JBs. AWLs., Retractable Davit Assy, Utility Piping, Inst. For Tempurge & Spares AND <b>Design &amp; Engineering</b> of Derrick structure
203	6012 *	2011	Tecnimont SpA India (NFL - Nangal project)	PDIL Noida	<b>Supply</b> of Hot & Cold Flare Systems components: Hot Flare tip FN 40 CB, Molecular seal AFS 42, Flare Stack riser, Knock Out drum, Cold Flare tip FNS 46, Mol. seal AFS 34 , KO drum, Common Auto/Manual FFG panel (8 pilots), Common Derrick structure, TCC/TTs/JBs. AWLs., Retractable Davit Assy, Utility Piping, Inst. For Tempurge, IR detectors & Spares etc.
204	6013	2011	Tecnimont ICB (NFL - Nangal project)		<b>Site Erection &amp; commissioning</b> of Hot & Cold Flare Systems components
205	6017	2011	Kazstroy Services Infra. I Pvt. Ltd (ONGC Konaban GGS proj)	Mott-Mac	Supply of Flare System: Flare tip FN 14, Molecular Seal AFS 14, Flare Stack riser, Water seal drum, Auto-manual ND FFG panel (3 pilots), Derrick structure, Retractable Davit, AWLs., Utility Piping, TCC/TTs., spares
206	6019	2011	Ace Energy (ONGC Lanwa GGS-III proj)	Prescient Energy	Supply of Flare System: Flare tip FNS 28/14 with IGS 14, Water seal drum, Manual FD FFG panel (3 pilots), Retractable Davit, AWLs., TCC/TTs., FG KO drum, spares and D/E of derrick, riser, KOD & utility
207	6021	2011	Essar Projects (Matix - Ammonia project)	PDIL Noida	<b>Supply</b> of FE & CE Flare Systems components: FE Flare tip FN 50 CB, Molecular seal AFS 60, Flare Stack riser, Knock Out drum, CE Flare tip FNS 60, Mol. seal AFS 30, stack riser, KO drum, 2 off Manual FFG panels (4 pilots), Common Derrick structure, TCC/TTs/JBs. AWLs., Retractable Davit Assy, Utility Piping, Instruments & Spares etc.
208	6030	2011	L&T Ltd. (NFL - Panipat project)	PDIL Noida	<b>Supply</b> of PG & Ammonia Flare Systems components: PG Flare tip FN 40 CB, Molecular seal AFS 40, Flare Stack riser, PG KO drum, Amm Flare tip FNS 38, Amm Mol. seal AFS 20 , Amm KO drum, 2 off Manual FFG panel (8 pilots), TCC/TTs/JBs. AWLs., Retractable Davit Assy, Utility Piping, Inst. For Tempurge, Spares etc. AND <b>Design &amp; Engineering</b> of Derrick structure
209	6031	2011	L&T Ltd. (NFL - Bhatinda project)	PDIL Noida	<b>Supply</b> of PG & Ammonia Flare Systems components: PG Flare tip FN 40 CB, Molecular seal AFS 40, Flare Stack riser, PG KO drum, Amm Flare tip FNS 38, Amm Mol. seal AFS 20 , Amm KO drum, 2 off Manual FFG panel (8 pilots), TCC/TTs/JBs. AWLs., Retractable Davit Assy, Utility Piping, Inst. For Tempurge, Spares etc. AND <b>Design &amp; Engineering</b> of Derrick structure
210	6032 ** / *	2011	Nagarjuna Oil Corp Ltd (Cuddalore ref. project)	UHDE Mumbai	<b>Supply</b> of Wet & Sour Flare Systems components: Wet Flare tip FUS 84 CB, Molecular seal AFS 84, Flare Stack riser, Water Seal drum, Sour Flare tip FUS 28 CB with Integral Gaseel IGS 28, Flare stack riser, Common Manual FFG panel (7 pilots) with LPG manifold, FG KO drum, Common Derrick structure, TCC/TTs/JBs. AWLs., Retractable Davit Assy, Utility Piping etc.
211	6033**				<b>Site Erection &amp; commissioning</b> of Wet & Sour Flare Systems components

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
212	6045	2011	EIL New Delhi (Onshore Gas terminal proj (AP) of M/s. GSPC)		Supply of Flare Stack Components: HC Flare tip FUS 24/12 CB, HC Flare Seal AFS 24, Sour Gas Flare tip FN 16 with seal IGS 16, Common FD Auto/manual FFG panels (6 pilots), TCC & other instruments, Common Davit, Comm. Spares & Mandatory Spares
213	6048	2011	Lubrizol		Supply of Flare tip with Integral Gaseel, Flare stack riser & FFG panel
214	6051	2011	GAIL		Supply of Flare Tip FUS 34/15 CB
215	6052 ** / *	2011	ONGC Mangalore Petrochemicals Ltd (MARC project)	Toyo	<b>Supply, Erection &amp; Commissioning</b> of Flare Stack: Flare tip FC 70 CB, Molecular Seal AFS 70, Flare Stack riser 72", Water Seal Drum, Auto/Manual FFG panel (4 pilots), Fuel Gas KO Drum, LPG manifold system, Derrick structure, Retractable Davit, AWLs., Utility Piping, TE/TCC/TT & other instruments
216	6059	2011	Toyo Engg India Ltd (SBR Plant project of M/s. ISRL Panipat)		Supply of Flare System components: Flare tip FUS 22/42 CB, Molecular Seal AFS 24, Water seal-cum-K O Drum, Manual FFG panel (3 pilots), Retractable Davit, TE/TCC/TT and Design & engg of Riser, Derrick etc.
217	6063	2011	IOCL Panipat (PNCP-EPCC9)		Supply of NCU Flare Tip FUS 60/80 CB & Acid Flare tip FN 18/12 CB
218	6066	2011	Cairn Energy India Pty Ltd		Supply of Flare stack components (for refurbishment of existing flare system at Raag Oil development project)
219	6071	2012	GAIL India Ltd	EIL New Delhi	Supply of Flare Stack Components: Flare tip FUS 66/24 CB, Flare Molecular Seal AFS 66, FD Auto/manual FFG panels (4 pilots), UV Flame detectors, TE/TCC & other instruments, Davit, Comm. Spares & Mandatory Spares
220	6072	2011	Punj Lloyd Ltd (ISPRL Mangalore)	Triune / EIL	Supply of Flare System components: Flare tip FUS 18/6 CB with IGS 18, Water seal Drum, Auto/Manual FFG panel (3 pilots), LPG Manifold, Retractable Davit, AWLs, TE/TCC/TT, Instruments and Design & engg of Riser, Utility & Derrick
221	6082	2012	IOCL Mathura Refinery	Technip	Adequacy Check of Flare tip and other Flare components of IOCL Mathura Refinery
222	6090	2012	Aditya Birla Chem (Thailand) Ltd.		Supply of Flare Flame Front Generator Panel
223	6092 *	2012	ONGC Ltd., Uran		Supply & Replacement of Flare tip, FFG panel, Piping & other instruments and associated maintenance job
224	6103	2012	TCI Sanmar, Egypt	Sanmar Engg	Supply of Water seal drum for Existing flare
225	6105	2012	IOCL, Panipat (PxPTA)		Supply of FUS 42/56 CB HC Flare Tip & FN 6 Biogas Flare Tip.
226	6106 **	2012	Reliance Industries Ltd.		Supply of Flare Tip
227	6107	2012	Essar Oil Ltd Jamnagar		Supply of H2S Flare Tip & FUS Flare Tip Parts.
228	6111 ** / *	2012	Tata Steel Ltd. Kalinga Nagar	M N Dastur	<b>Supply, Erection &amp; Commissioning</b> of CO Gas Flaring System: 4 nos. FNS 30/12 Flare tips with IGS 12 & Flare tip shut off valves, Self supported Flare stack riser with ladder & platforms, Manual/electric FFG panel for 12 nos. pilots, TE/TT/TCC, AWLs, Utility piping, Electrical & Instrumentation
229	6119	2013	Cairn India Ltd / Saraswati Ph-2 project		Supply of Flare Pit Components: FAB 6/10 Flare Tip with IGS 6, Water Seal Drum, Manual/Ele FFG panel, TE/TCC, Air Blower & Utility piping

**Flare Reference List**

Sr. No.	AFIL JOB NO	YEAR OF ORDER	CLIENT	CONSULTANT	EQUIPMENT
230	6126	2013	Cairn India Ltd / Aishwarya Wellpad-08		Supply of Flare Pit Components: FNS 12 Flare Tip with IGS 6, Manual/Ele FFG panel, TE/TCC & Utility piping
231	6139 **	2013	Gasmar S. A., Chile		Supply of Flare Components: FAB 8/10 Flare Tip, Molecular Seal AFS 8, Gas & Air Risers, K O Drum, Manual/Ele FFG panel, TE/TCC, Air Blower, Utility piping, Guy Wire Supporting Arrangement, Davit & Aircraft warning lights
232	6150 **	2013	Tata Projects Ltd (BFG Flare at NMDC)	Mecon	Supply of Flare Components: FNS 112 Flare Tip with IGS 112, Auto-Manual/Ele FFG panel, TE/TCC, Utility piping, Instruments & Design/engg.
233	6154 **	2013	Kemaman Bitumen Co. Sdn Bhd, Malaysia		Supply of Flare Components: Auto-Manual/Ele FFG panel, TE/TCC, IR Pilot Flame Detectors
<b>** Under Execution</b>				<b>* Turnkey Projects : 50</b>	



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## **ANNEXURE – 3**

### **LIST OF PLANT & MACHINERIES**





## LIST OF PLANT & MACHINERIES

### A. PLANT

Sr. No.	Description	Area (W X L) mtrs.	EOT Crane Capacity / make	Qty. Nos.
<b>1</b>	<b>Sheds &amp; Crane Details</b>			
1.1	Shed – 1	10 x 100 (1000 m <sup>2</sup> )	5 Tons X 6.5 Mtrs lift / Yamuna	1
			15 Tons X 6.5 mtrs lift / Vikrant	1
			10 Tons X 6.5 mtrs lift / Hi-tech	1
1.2	Shed – 2	20 x 100 (2000 m <sup>2</sup> )	5 Tons X 5 Mtrs lift / Hi- tech	1
			5 Tons X 6.5 Mtrs lift / Vikrant	1
1.3	Shed – 3	10 x 25 (250 m <sup>2</sup> )	5 Tons X 5 Mtrs lift / Vikrant	1
1.4	Open Finished Area (Leveled & concreted)	25 X 50 (2 nos.) (250 m <sup>2</sup> )	Mobile Hydra crane / escort	2
<b>2</b>	<b>Electric Power</b>	GEB contract demand	180 kVA	
<b>3</b>	<b>D G Set</b>	Kirloskar / cumin	125 kVA	1

➤ Total under crane covered manufacturing space: **3250 m<sup>2</sup>**



## **B. MACHINERIES**

<b>Sr. No.</b>	<b>Description</b>	<b>Make</b>	<b>Capacity</b>	<b>Qty. Nos.</b>
<b>1</b>	<b>CUTTING FACILITIES</b>			
1.1	CNC profile cutting m/c	PRO ARC	16 mm on CS	1
1.2	PUG Cutting m/c	ESAB	60 mm	5
1.3	Gas Cutting Torches	ESAB	60 mm	8
1.3	Air Plasma Cutting m/c	Electro Plasma	16 mm on SS	1
1.4	Abrasive cut off m/c	Sahyog	4" pipe, 2" rod	1
1.5	Abrasive cut off m/c	KPT	2" pipe , 1" rod	1
1.6	Hack Saw m / c	VISHAL	8" X 20 " strock	1
<b>2</b>	<b>SHELL ROTATORS</b>			
2.1	Motorised	MEMCO	10 Tons X 2000 mm	1
2.2	Motorised	AMIN Machinery	15 tons X 2500 mm	1
2.3	Motorised	AMIN Machinery	25 tons X 2500 mm	3
2.4	Heavy duty	AFIL	40 tons	2
2.5	Heavy duty	AFIL	50tons	2
<b>3</b>	<b>WELDING FACILITIES</b>			
3.1	Submerged Arc Welding	MEMCO	1200 amps	2
3.2	TIG Welding	Standard Engg.	400 Amps	3
3.3	MIG Welding	TURBO ARC	400 Amps	2
3.4	DC Rectifiers	ADOR / OMAX / GAYATRI	400 Amps	18
3.5	DC inverter welding m/c	MEMCO	400 Amps	5
3.6	Electrode baking Ovens	MEMCO	50 to 400 Deg C	4
3.7	Welding Boom	AMIN	4 m dia.	1
<b>4</b>	<b>PLATE BENDING</b>			
4.1	3 roller pyramid type	HIMALAYA	2500 mm X 25 mm thk	1
4.2	3 roller pyramid type	CHAUDHARY	2500 MM X 16 mm thk	1
<b>5</b>	<b>SHEARING MACHINE</b>	CITIZEN	2000 MM x 10 MM	1
<b>6</b>	<b>HYDRAULIC PRESS</b>	CITIZEN	100 tons	1



Sr. No.	Description	Make	Capacity	Qty. Nos.
<b>7</b>	<b>AIR COMPRESSOR</b>			
7.1	Screw type - air cooled	ATLAS Copco	7.5 bar X 250 CFM	1
7.2	Piston type - 2 stage	I R	7.0 bar X 50 CFM	1
7.3	Piston type - 2 stage	Elgi	7.0 bar X 50 CFM	1
<b>8</b>	<b>MACHINING FACILITIES</b>			
8.1	Heavy duty Lathe	RAVI	5 Ft. bed X 20" centre ht	1
8.2	Precision lathe	ACCURATE	4 Ft. bed X 8" centre ht	1
8.3	Precision lathe	BANKA	4 Ft. bed X 8" centre ht	1
8.4	Precision lathe	RAVI	4 Ft. bed X 8" centre ht	1
8.5	precision drill pillar type	KKP	1/2" X cone pully drive	1
8.6	Pillar type drill	SIDHPURA	1" X cone pully drive	1
8.7	Radial Drill	SIDHPURA	40 mm X 1 mtr arm	3
8.8	Magnetic base drill	ROTON	25 mm capacity	3
8.9	Radial Drill	HMT	62 mm X 1.5 mtr arm	1
<b>9</b>	<b>GRINDING MACHINES</b>			
9.1	Portable AG - 7	KPT / BOSCH	2.5 HP x 8500 rpm	16
9.2	portable AG - 4	KPT / BOSCH	1.0 HP X 8500 rpm	6
9.3	Portable GQ - 4	KPT	2.5 HP x 8500 rpm	1
9.4	Bench Grinder			2
9.5	Portable Shaft grinder	WOULF	Single phase x	1
9.6	Portable Shaft grinder		3 phase X	1
<b>10</b>	<b>MEASURING &amp; TESTING INSTRUMENTS</b>			
10.1	Digital Verniers	MITUTOYO	0 to 300 mm	2
10.2	Micro meters	MITUTOYO	0-25, 25-50, 50-75, 75-100	1 each
10.3	Plug / Ring / Pin gauges		various	
10.4	Coat thickness Meter	COAT METER	0 - 600 micron	1
10.5	Digital coat thickness	YUYUTSU	0 - 2000 micron	
10.6	Hardness tester			1
10.7	D- Meter	MODSONIC	1 MM TO 300 MM	1
10.8	X ray Film Viewer			1
10.9	Measuring Tapes	Free mans	5mtrs, 15 mtrs, 25 mtrs, 30 mtrs	1 each
<b>11</b>	<b>HUMIDITY TESTER</b>			1



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**ANNEXURE – 4**  
**DESIGN COMPETENCY**



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## DESIGN COMPETENCY

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We possess a team of experienced Design personnel to carry out wide range of detailed design & engineering activities ranging from process, mechanical, structural & civil, piping, instrumentation & electrical etc. In addition, we have also established a group of designers on regular basis to aid our in house design function.

The following is a list of our key personnel who are responsible for the design & engineering in house:

M K Dwivedi – who leads the team of following key personnel – having vast experience of more than 25 years in engineering of flare products, providing detailed technical know-how & also familiar with the present market trends.

**Engineering:**

- Ketan Purohit
- D C Mody
- Himansu Bhatt
- Purav Shah

**Design & drawing:**

- V K Nautiyal
- J D Parmar
- Keyur Raval
- Bhaumik Gajjar

We have in-house facility to generate all kinds of drawings with up-to-date drawing department possessing required computer facilities.

The engineering team has successfully executed nos. of prestigious projects (few on the turnkey basis) involving detailed design & engineering with respect to process, mechanical, structural & civil, piping, instrumentation & electrical; which reveals our design competency fulfilling the customer requirements.



We are pleased to summarise few of the prestigious flare projects, with whom we had been fortunate to get ourselves associated, as under:

- Recently executed:
  - PREP project of M/s. IOCL Panipat refinery,
  - PxPTA projects of M/s. IOCL Panipat refinery,
  - Green Fuel & Emission Control project of M/s. HPCL Mumbai and
  - Visakh Refinery Clean Fuel project of M/s. HPCL Vizag.
  - 70000 TPA ISO Propyl Alcohol Project of M/s. Deepak Fertilisers and Petrochemicals Corp. Ltd.
  - Ammonia-V Technology Upgradation Project of M/s. RCFL, Trombay, Mumbai
  - The 130T RHD-TOP Unit at M/s. Jindal Vijayanagar Steel Limited, Tornagallu
  - Upgradation of EPS to GGS – Agartala Dome Project of M/s. ONGC, Assam
  - Upgradation of Baramura GCS Project of M/s. ONGC, Assam
  - New 300 TPD Methanol Distillation Unit (MDU) Project of M/s. GNFC Bharuch
  - DHDT project of M/s. BRPL Assam
  - Offsites for TCI Sanmar Chemicals, Egypt
  - Propylene Recovery Unit of M/s BPCL Kochi refinery
  - Flare Stack System for Expansion of GCS Olpad project of M/s. ONGC
  - Capacity Expansion cum Modernisation Project, Phase-II (CEMP-PH-II) of M/s BPCL Kochi refinery
  - Flare Stack for Diesel Quality Upgradation Project (DQUP) of M/s. NRL
  - Supply & Installation of Flare Package for Amine Treatment Unit for NCU of M/s. IOCL at Panipat
  - Panipat Naptha Cracker Project (PNCP), EPCC-9 of M/s. IOCL Panipat refinery
  - Flare Stack for Guru Gobind Singh Refinery Project, Bathinda of M/s. HPCL-Mittal Energy Ltd. (HMEL)
  - MRPL – III project of M/s. MRPL, Mangalore
  - IPPL Propane/ Butane / LPG Import Terminal project at Ennore
  - TDI Dahej Plant project of M/s. GNFC
  - 525 MTPD Methanol Project of M/s. GSFC
  - Staged Flaring – Offsite & Utilities at Barauni refinery of M/s. IOCL
  - LT Flare system with Demountable derrick for M/s. IOCL Paradeep refinery
  - Mangalore Aromatic Complex project of M/s. OMPL Mangalore



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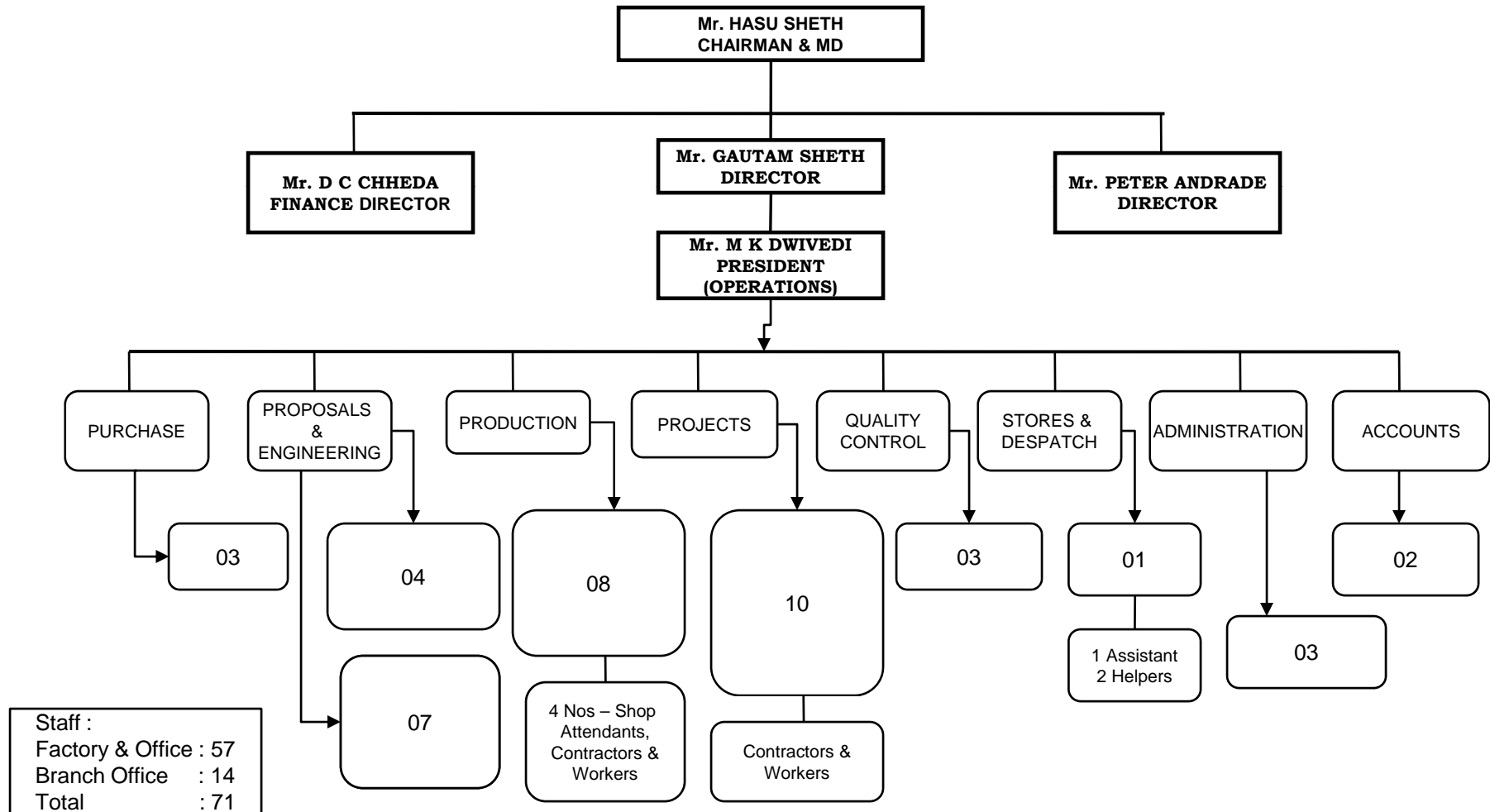


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**ANNEXURE – 5**  
**ORGANISATION CHART**



## ORGANISATION CHART







**AIROIL FLAREGAS** Private Limited



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## **ANNEXURE – 6**

### **DETAILS OF PRESTIGIOUS ORDERS**



## DETAILS OF PRESTIGIOUS ORDERS

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

<b>Overall Flare Height</b>	<b>100M</b>
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<b>Technical Description of Major Equipments (Scope involved)</b>		
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.
<b>Stack Riser</b>	SA672 Gr.70 CL 22	<b>62 inch x ~75m lg.</b>
Water Seal Drum	SA516 Gr.70	68" Inlet / 62"Outlet / 6.63m dia. x 14mm thk.
<b>Flare Gas Header</b>	SA516 Gr.70	<b>68" x 110 m lg.</b>
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		



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

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

<b>Governing Technical Parameters</b>			
<b>Parameters</b>	<b>HC FLARE</b>	<b>BIOGAS FLARE</b>	<b>SOUR FLARE</b>
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

<b>Overall Flare Height</b>	<b>107M</b>
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<b>Technical Description of Major Equipments (Scope involved)</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
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.
<b>HC Stack Riser</b>	SA672 Gr.70 CL 12	<b>48 inch x ~80m lg.</b>
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.
<b>HC Flare Gas Header</b>	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.
<b>Common Derrick Structure</b>	CS/MS	For overall flare height of 107 m
Header Trestle & other supports for Plant Utility Piping	CS/MS	
<b>Common Davit Arrangement</b>	CS/MS	For all (HC, Bio & Sour) flare tips
<b>Common Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 8 pilots</b>		
Instrumentation including Ultrasonic Mass Flow meter, Transmitters for Pressure / Temperature / Flow applications, Thermocouple Cables and other Electrical items		



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

<b>Scope of Work / Supply</b>
Design, engineering, procurement, manufacture & supply of Flare Stack Components for <b>Green Fuel &amp; Emission Control (GFEC) project</b> 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: <b>Mechanical works, Static Equipment, &amp; Structural works</b>

<b>Governing Technical Parameters</b>		
<b>Parameters</b>	<b>HC FLARE</b>	<b>SOUR FLARE</b>
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)

<b>Overall Flare Height</b>	<b>110M</b>
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<b>Technical Description of Major Equipments (Scope involved)</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
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)
<b>Common Davit Arrangement</b>	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)		
<b>HC Flare Gas Header</b>	SA516 Gr.70	<b>60 inch x ~100m lg. – 12mm thk.</b>
<b>Sour Flare Gas Header</b>	SS 304	<b>18 inch x ~50m lg.</b>
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	



**Flare (60" dia. x 110m high) in operation at HPCL Mumbai Refinery, Green Fuel & Emission Control (GFEC) Project**





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

<b>Scope of Work / Supply</b>
Design, engineering, procurement, manufacture & supply of Flare Stack Components for <b>Visakh Refinery Clean Fuel (VRCF) Project</b> 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: <b>Civil &amp; Structural works, Mechanical works, Static &amp; Rotating Equipment, Electrical works, Instrumentation works</b>

<b>Governing Technical Parameters</b>		
<b>Parameters</b>	<b>HC FLARE</b>	<b>SOUR FLARE</b>
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)

<b>Overall Flare Height</b>	<b>80M</b>
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<b>Technical Description of Major Equipments (Scope involved)</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
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)
<b>Common Davit Arrangement</b>	CS/MS	For both (HC & Sour) flare tips
<b>Common Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 7 pilots</b>		
Loose Instruments & Thermocouple Cables		
Water seal drum & Knock out drums (Supplied by others)		
HC Stack Riser	SA516 Gr.70	<b>60 inch x ~50m lg. – 12mm thk.</b>
Sour Stack Riser	SS 304	<b>14 inch x ~50m lg.</b>
<b>HC Flare Gas Header</b>	SA516 Gr.70	<b>60" x 325 m lg./ 54" x 125 m lg./ 42" x 70 m lg.</b>
<b>Sour Flare Gas Header</b>	SS 314L	<b>14" x 150 m lg.</b>
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from <b>1" NB to 12" NB</b> 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		



**Flare (60" dia. x 80m high) in operation at  
HPCL Vizag Refinery, Visakh Refinery  
Clean Fuel (VRCF) Project**





<b>Client Name (Project)</b>	<b>M/s. NAFTOGAZ India Pvt. Ltd. (PNCP – EPCC9)</b>	<b>5</b>
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<b>Contract Reference (Our job ref.)</b>	
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)

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

<b>Governing Technical Parameters</b>			
<b>Parameters</b>	<b>NCU HC FLARE</b>	<b>Polymer HC + MEG FLARE</b>	<b>LP HC FLARE</b>
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
<b>Overall Flare Height</b>	<b>119M</b>	<b>130M</b>	<b>20M</b>

<b>Technical Description of Major Equipments (Scope involved)</b>		
➤ <b>NCU HC FLARE PACKAGE</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
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.
<b>Stack Riser</b>	SA516 Gr.70	<b>72 inch x ~100m lg. – 8mm thk.</b>
Water Seal Drum	SA516 Gr.70	72" Inlet / 72"Outlet / 6.642m ID x 14mm thk.
<b>Flare Gas Header</b>	A672 Gr.B60 CL.12	<b>72" x ~90 m lg./ 54" x ~25 m lg</b>
Other Utility Piping for Steam, Fuel Gas, Water, Nitrogen, Plant Air, Inst. Air etc.	SS / CS	Having diameter ranging from <b>1" NB to 24" NB</b> 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		





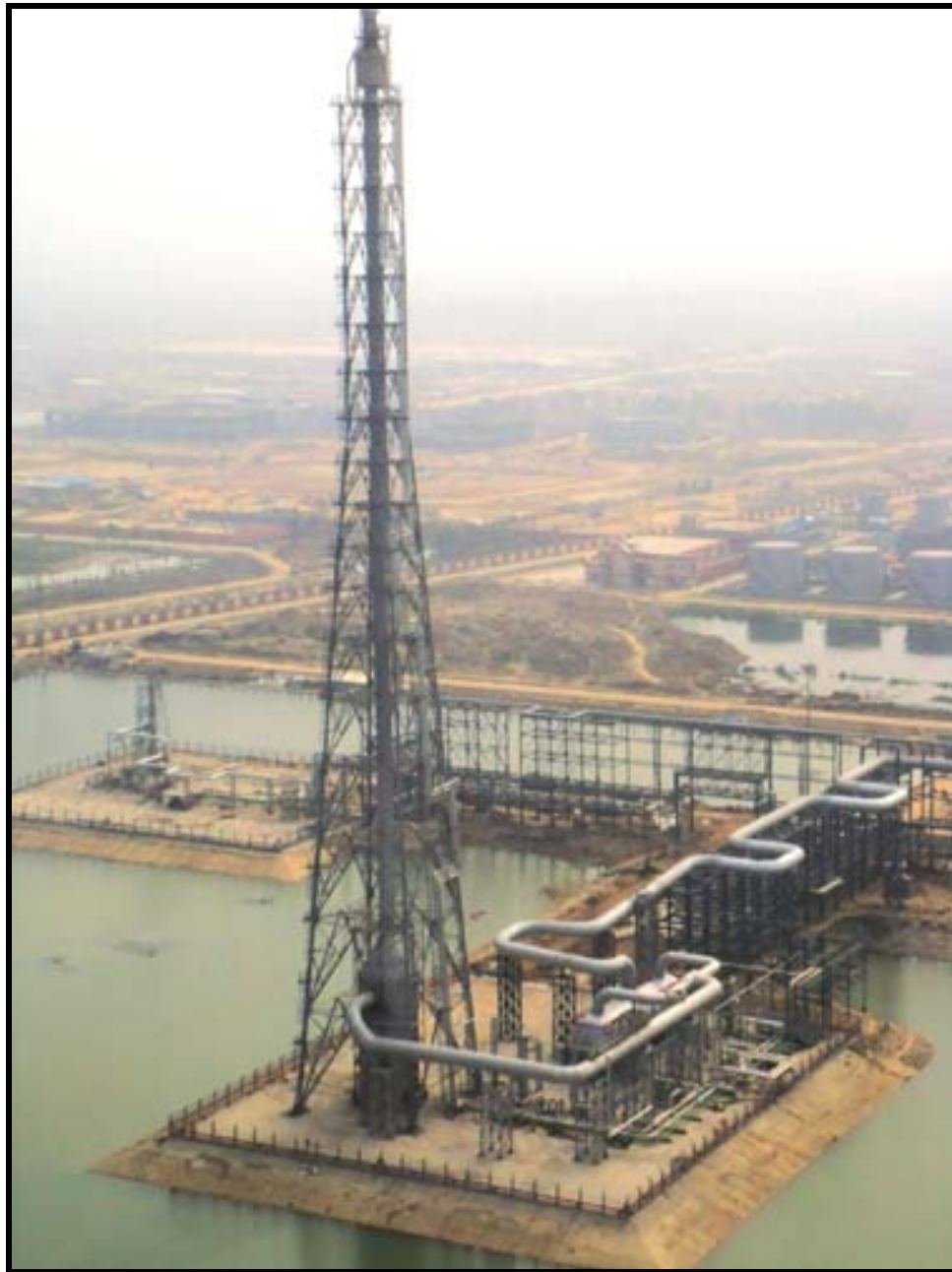
<b>➤ Polymer HC + MEG FLARE PACKAGE</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
Flare Tip (FUS 60/42 CB)	Incolloy 800H	60 inch x 3m lg.
Molecular Seal (AFS 60)	SS 316L	3.5m dia. x 6.6m lg.
<b>Stack Riser</b>	SA516 Gr.70	<b>76 inch x ~110m lg. – 10mm thk.</b>
MEG Stack Riser	A106 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.
<b>Flare Gas Header</b>	A672 Gr.B60 CL.12	<b>76" x ~90 m lg./ 56" x ~25 m lg</b>
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		
<b>➤ LP HC FLARE PACKAGE</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
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)**



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

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

<b>Governing Technical Parameters</b>		
<b>Parameters</b>	<b>Case 1</b>	<b>Case 2</b>
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

<b>Overall Flare Height</b>	<b>122.5 M</b>
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<b>Technical Description of Major Equipments (Scope involved)</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
<b>➤ Supply, Installation &amp; Commissioning of:</b>		
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		



**Water Seal Drum  
(3.8 m dia.)  
Ready for Dispatch  
from our works for  
OMPL Mangalore**



**OMPL Mangalore  
Flare Site at the  
time beginning of  
Site Work**



**OMPL: Erection in progress of Derrick Structure (122.5 m high) and Flare Stack Riser (72" NB dia.)**







**OMPL : (Left)  
Erection in progress  
of Molecular Seal  
(4 m dia.)  
at height of ~120m.**

**And**

**(Below) Flare Stack  
installed along with  
Flare tip (overall  
height 122.5m)**





<b>Client Name (Project)</b>	<b>M/s. IOT Infrastructure &amp; Energy Services Ltd (Crude &amp; Finished Products Tankages Facility at Paradip Refinery Project, Orissa)</b>	<b>7</b>
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<b>Contract Reference (Our job ref.)</b>
PO no.: ER02100101/201000934 dated 24.01.2011 <b>(J-5994)</b>

<b>Scope of Supply</b>
Design, Engineering, Manufacturing, Testing, Inspection & Supply of LT Flare System Package (220-A-017) (2 nos. <b>Demountable</b> 24" NB dia. Flare Stacks – one operating + one standby) for Crude & Finished Products Tankages Facility at Paradip Refinery Project, Orissa project

<b>Governing Technical Parameters</b>		
<b>Parameters</b>	<b>Case 1</b>	<b>Case 2</b>
Peak Flow Rate	198000 kg/hr (LPG)	207000 kg/hr (Propylene)
Mol. Weight	44.1	42.08
Temperature	64 °C	64 °C
Smokeless Flare load	FG purge	FG purge
Total Pre. Drop	5000 mm WC	5000 mm WC

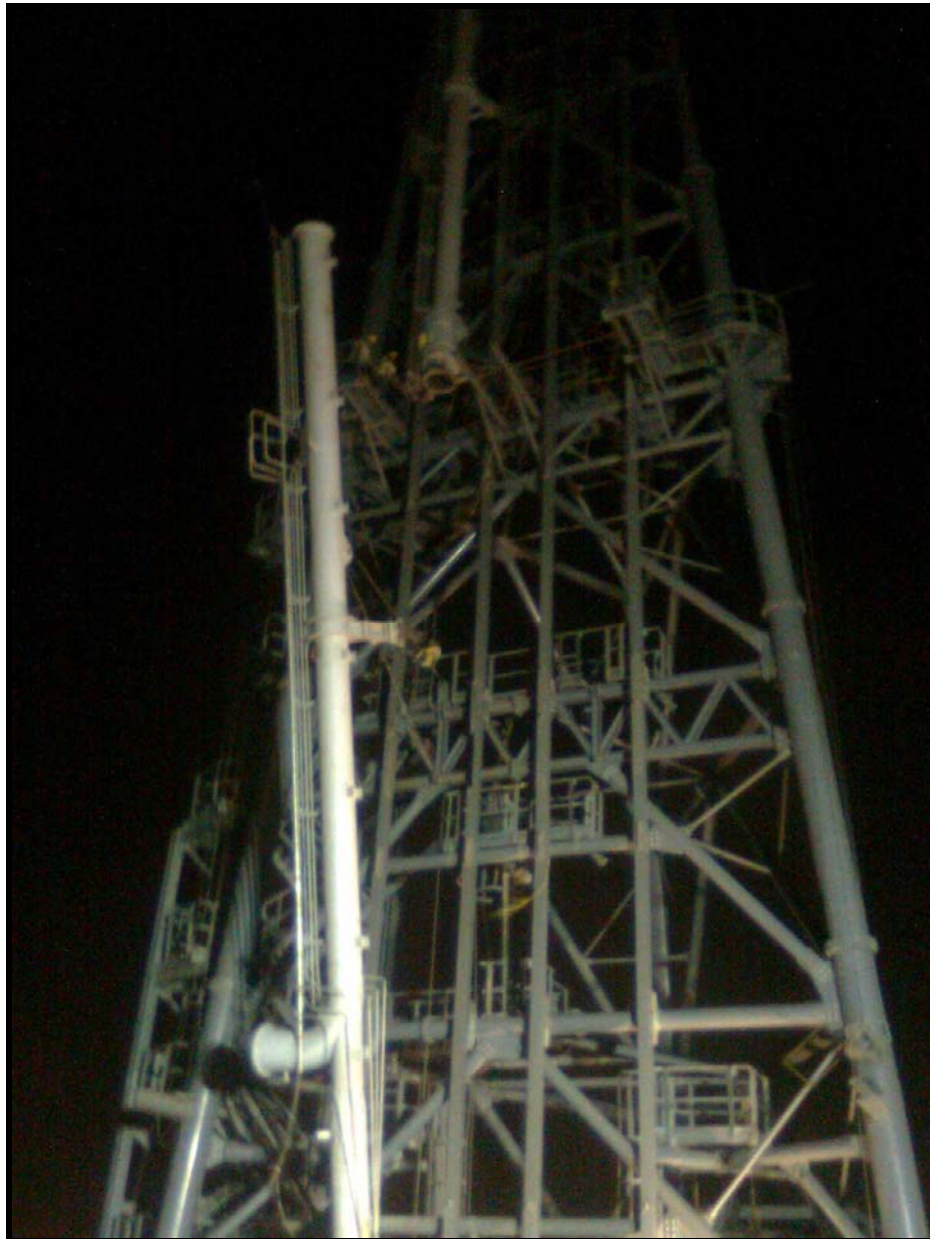
<b>Overall Flare Height</b>	<b>76.5 M</b>
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<b>Technical Description of Major Equipments (Scope involved)</b>		
<b>Item (Model no.)</b>	<b>MOC</b>	<b>Size (Description)</b>
➤ <b>Supply and Supervision of Installation &amp; Commissioning of:</b>		
Flare Tip (FC 24 CB) with Integral Gaseel (IGS 24)	SS 310/ Incolloy 800H	24 inch x 3m lg.
Flare Stack Riser	SA333 Gr.6	24 inch x 73.5m lg. – 9.53mm thk.
Utility Piping for Steam, Pilot Gas & Flame front etc.	CS	Having diameter 1" NB & 2" NB for overall length of 73.5m duly mounted on Flare Stack Risers
<b>Demountable</b> Derrick Structure	CS/MS	For overall flare height of 76.5 m
Flame Front Generator Panel - FD Auto/Manual suitable for monitoring 4 pilots		
Loose Instruments & Thermocouple Cables		



**Demountable Flare  
Stack Risers  
(24" dia.)  
Ready for Dispatch  
from our works**





**Installation in progress of Demountable Flare Stack Riser (24" dia.) at IOCL Paradip Refinery**



**PHOTOGRAPHS OF FEW OTHER FLARE SITES**



**Flare (8" dia. x 30m high) for Expansion of GCS Olpad project of ONGC Ankleshwar, Gujarat**



**Flare (24" dia. x 52m high) in operation at Hazira Port & LNG Terminal**





**Flare (72" dia. x 100m high) in operation at IOCL Barauni Refinery**



**Ground Flare at GGS-II of ONGC Rudrasagar field, Assam**





**AIROIL FLAREGAS** Private Limited



ISO 9001:2008 ISO 14001:2004  
FM 548440 EMS 548441

**ANNEXURE – 7**  
**CERTIFICATES FROM CUSTOMERS**



Ref: NG/LTR/11-12/071  
Date : 25<sup>th</sup> August 2011

**MECHANICAL COMPLETION CERTIFICATE**

Project	Panipat Naphta Cracker Project, EPCC-9
Client	M/s Indian Oil Corporation Limited, Panipat
Consultant	M/s Engineers India Limited
LOI No.	NGH-6556/EPCC-9-P-0006 dt. 21.12.2006
Value of Contract	Rs. 41.51 crores
Job Description	Design, Engineering, Supply, Installation & Commissioning of Flare System for Balance Offsite & Utilities and inter connection with Panipat Refinery Marketing Terminal for IOCL's Panipat Naphta Cracker Project (PNCP) EPCC-9
	<ul style="list-style-type: none"><li>• NCU HC Flare System</li><li>• Polymer HC Flare System</li><li>• LP HC Flare System</li></ul>

The above mentioned job has been mechanically completed satisfactorily in all respects by M/s Airoil Flaregas India Private Limited as per LOI Terms and Conditions on following dates

NCU HC Flare System	Mechanical completion on 07.03.2011
Polymer HC Flare System	Mechanical completion on 11.03.2011
LP HC Flare System	Mechanical completion on 14.03.2011

Thanking you

Yours faithfully  
For Naftogaz India Private Limited

Authorized Signatory



PLANT :  
POST BOX NO. - 12, DURGACHAK  
HALDIA - 721602  
DIST. PURBA MEDINIPORE  
WEST BENGAL, INDIA  
TEL : +91 (03224) 272756  
274400/877/881/882/007  
FAX : +91 (03224) 274420/861/880/272750

December 30, 2009

**To whomsoever it may concern**

This is to certify that the existing flare tip assembly at Haldia Petrochemical Ltd at Haldia complex commissioned in the March 2000 was supplied by Airoil Flaregas (India) Pvt. Ltd. The flare was designed to following requirements:

Flare gas quantity: 12, 86,400 kg per hour  
Flare gas temperature: 70 deg C  
Average molecular weight: 41.65  
Overall flare height: 120m

The system was in operation till October '09 when the same has been dismantled and is being replaced another flare tip assembly of larger capacity supplied by a different vendor to suit to new enlarged capacity of the plant complex now under expansion.

**For HALDIA PETROCHEMICALS LIMITED**

A handwritten signature in black ink, appearing to be "S. R. Ghosh", written over a circular stamp or seal.

**S. R. Ghosh**  
**Head – Plant & Projects**



## MECHANICAL COMPLETION CERTIFICATE

Owner : Indian Oil Corporation Limited (IOCL)  
Engineer-in-Charge : Engineers India Limited (EIL)  
Contractor : AIROIL – FLAREGAS (INDIA) PVT. LTD.

### **Part A. Mechanical Completion Certificate**

LOA No. : PJ/CC/PREP/T-055/LOA Dated 3.12.2003  
Contract Title : HC Flare Stack System for Panipat Refinery Expansion Project  
Of M/s Indian Oil Corporation Limited, at Panipat (Haryana)

EIL/ IOCL, having been notified by AIROIL – FLAREGAS (INDIA) PVT. LTD in writing vide letter no. AFIL/5325/2005 dated 1<sup>st</sup> October 2005, "Notification of Mechanical Completion of HC Flare Stack System for Panipat Refinery Expansion Project of M/s Indian Oil Corporation Limited", that the Mechanical Completion is achieved, hereby certifies that the Mechanical Completion, undertaken and completed by AIROIL – FLAREGAS (INDIA) PVT. LTD., has been achieved and is formally accepted by IOCL with effect from the date given herein below without prejudice to clause number 4.4.0.0 including its sub clauses of G.C.C. and its related amendments in the subject CONTRACT.

**MECHANICAL COMPLETION DATE : 30<sup>th</sup> September 2005**

### **Part B. Signed by and received for and on behalf of**

**Indian Oil Corporation Ltd.**

**S.N. Choudhary**  
General Manager (Tech)

**Engineers India Ltd.**

**R.K. Batra**  
Resident Construction Manager

**Airoil-Flaregas (I) Pvt. Ltd**

**M.K. Dwivedi**  
General Manager (Operations)

**A.K. Das**  
Chief Project Manager

**B.K. Sonowal**  
Deputy General Manager

**C.R. Patel**  
Resident Construction Manager



## MECHANICAL COMPLETION CERTIFICATE

Owner : INDIAN OIL CORPORATION LIMITED (IOCL)  
Engineer In-Charge : ENGINEERS INDIA LIMITED  
Contractor : AIROIL-FLAREGAS (INDIA) PRIVATE LIMITED  
Contract No. : PJ/CC/PX-PTA/T-063/LOA dated 12.02.2004  
Contract Title : Project Management, Design, Detailed Engineering, Procurement, Manufacture, Supply, Transportation, Storage, Fabrication, Construction, Installation, Testing, Pre-Commissioning & Commissioning of HC, Sour & Biogas flare systems for integrated PX-PTA Project of M/s Indian Oil Corporation Limited at Panipat (Haryana)

This is to certify that Mechanical Completion of HC, Sour & Bio gas flare systems for integrated PX-PTA Project has been achieved by M/s. Airoil-Flaregas (India) Private Limited on 31<sup>st</sup> March, 2006 and the same has been accepted by EIL and IOCL without any prejudice to the contract provisions and General Conditions of the Contract and its related amendments.

This Certificate is being issued with respect to M/s Airoil-Flaregas (India) Private Ltd's Letter No AFIPL/J-5338/PX-PTA/136 dated 30<sup>th</sup> March, 2006.

Engineers India Ltd.

Indian Oil Corporation Ltd.

Airoil-flaregas (India)  
Private Limited

S.C. Barman

Resident Construction Manager

  
31/3/06

Sanjiv Singh

Deputy General Manager

Udit Mittal

Regional Manager

R.K. Sharma

Area Co-ordinator

  
31 March 2006

A.K. Goel

Chief Project Manager

K.P. Balan

Resident Construction Manager

*Part: W 101/102/103 104/105*

**इंजीनियर्स  
इंडिया लिमिटेड**  **ENGINEERS  
INDIA LIMITED**  
(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)

एच.पी.सी.एल. (जी.एफ.ई.सी.) परियोजनाएं, पी.ओ. बॉक्स नं. 8816, माहुल, मुम्बई-400 074.  
H.P.C.L. (G.F.E.C.) Projects, P.O. Box No. 8816, Mahul, Mumbai - 400 074.

**COMPLETION CERTIFICATE**

Name of Work	: Flare Stack and Associated work. (GFEC Project) – HPCL Site, Mumbai.
Name of Contractor	: M/G. Anil Fluor Gas (I) Pvt. Ltd.
P. O. no.	: 6000212-OQ-48009 dated. 10.07.06.
LOI No.	: LOI No. 539 dated. 02.06.06.
Contractual Completion Date	: 01.02.2007
Actual Completion Date	: 16.05.2008
Commissioning Date	: 21.05.2008
Awarded Value of Work	: 4, 98,00,000.00.
Final Executed Value of Work	: 4, 79,83 528.67.
Time Extension given upto	: 31.05.08
5% LD Applicable	: NA
Liability Period	: 20.05.2009

This is to certify that the agency has performed all its obligations under the contract.

Dated: 09.03.09

  
Resident Construction Manager.)

BHARAT PETROLEUM CORPORATION LTD.  
REFINERY DIVISION, MAHUL  
MUMBAI - 400 074.

DATE :

COMPLETION CERTIFICATE

Name of Work : NEW FLARE STACK FOR DHDS PROJ.  
Name of the Contractor : MJS AIR OIL FLARE GAS (INDIA) LTD.  
Contract No. & Date (W.O. No.) : LOI, NO: 3829/EIL/19 DTD. 24-9-1998  
Date of Commencement of Work : 24-9-1998  
Date of Completion of work as per agreement : 23-02-1999  
Actual date of completion of work : 31-05-1999  
Extension of time granted : Yes / No / Recommended  
If yes, the letter ref. No. : 3829/EIL/19 dtd. 31-03-1999  
Vale of Completed work : Rs. ~~4,60,73,251.48~~ ~~4,64,89,475.48~~  
Date of Taking over of the completed work : ~~4,60,97,399.98~~  
~~4,60,85,522.18~~

Certified that the above work has been completed in all respects as per drawings, specifications and directions of Engineer-in-Charge on .....31-05-1999... and has been taken over from the contractor.

It is also certified that the contractor has cleared / cleaned the site (qwtessed by the concerned Engineer from BPCL on dtd. ....As directed by Engineer-in-Charge.

  
ENGINEER-IN-CHARGE

NAME :

G. S. NATARAJ

Countersigned

Resident Consn. Manager  
ENGINEERS INDIA LTD

  
DEPARTMENTAL HEAD

NAME :

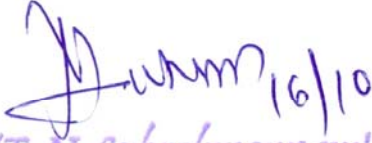
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प्रबन्धक  
इंजीनियर्स इंडिया लिमिटेड  
पी.पी.सी.एल. (पि.), माहुल, मुम्बई.

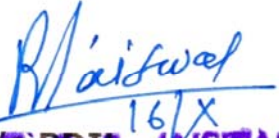
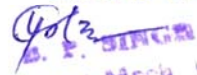
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S. No. <u>.....</u>

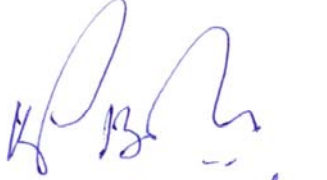
## Mechanical COMPLETION CERTIFICATE

Project : Namrup Revamp  
Client : M/s BVFCL, Namrup  
Consultant : M/s PDIL  
Purchase Order No. : 1064/W/110/B/ICB  
Job Description : Combined Flare System for A-I & II

The above mentioned job has been mechanically completed satisfactorily in all respect on 03.09.2004 by M/s Air Oil Flare Gas (India) Pvt. Ltd., as per work order terms & conditions.

  
(T. N. Subrahmanyam)  
M/s BVFCL  
Chief Engineer (Mech).  
Revamp Project Cell,  
BVFCL, Namrup  
16/10/04

  
M/S. PDIL. JAISWAL  
16/10  
RCM, PDIL  
BVFCL Revamp Project  
Namrup ( Assam )  
  
S. P. SINGH  
Asst Engr. ( Mech ) PDIL  
HFCL Revamp Project  
NAMRUP. ( Assam )

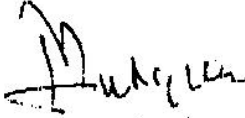
M/s Air Oil  
  
P. Bala  
AIROIL-FLAREGAS (I) PVT. LTD,  
BVFC SITE




## COMMISSIONING CERTIFICATE

Project : Namrup Revamp  
Client : M/s BVFCL, Namrup  
Consultant : M/s PDIL  
Purchase Order No. : 1064/P/110/A/ICB  
Job Description : Combined Flare System for A-II

The Combined Flare System for Ammonia-II duly erected by M/s Airoil Flaregas (India) Pvt. Limited has been commissioned successfully on ~~29.04.2015~~, as per work order terms & conditions.  
29.04.2015

  
N. Subramanian  
M/s BVFCL  
Namrup  
29/04

  
M/s PDIL  
E. G. P. JAISWAL  
RCM, PDIL  
BVFCL Revamp Project  
Namrup (Asstt.)



# OIL & NATURAL GAS CORPORATION LIMITED

ENGINEERING AND CONSTRUCTION DIVISION  
2<sup>nd</sup> FLOOR, CONST. & MAINTENANCE, BUILDING,  
MAKARPURA ROAD, VADODARA – 390009.

FAX NO : 91-265-641296

PH : 641924

NO: BDA/E&C/ICP-B-S/MOD/4-AF/97

DATED : 5<sup>th</sup> JULY 2001

## COMPLETION CERTIFICATE

This is to certify that M/S Air Oil Flare Gas (India) Ltd., Indrad, Mehsana – 382721 was awarded the Turnkey works including Engineering, Fabrication, Supply Erection, Installation and Commissioning etc of Flare System at Balol GGS- IV , North and South Santhal GGS cum CTF at lumpsum price of Rs 352.0 lacs (Rupees Three Crores Fifty two lacs) only on 08.05.97 with completion by 07.11.97 vide Contract No. BDA/SP/OPS/PM/31(1)/INSITU/ MOD/FLARE/96/C-018.

The schedule completion date was revised to 09.06.2000 for the reasons not attributable to the Contractor.

The works of commissioning and performance test runs as envisaged in the Contract were deleted from the Scope of Work of Contractor and the value of the Contract was reduced to Rs. 348.48 lacs.

M/S Air Oil Flare Gas (India) Ltd., has successfully completed all the works in all respect including trial run on NO LOAD / Testing with LPG as per detail below.

(i)	North Santhal GGS cum CTF .....	04.05.2000
(ii)	South Santhal GGS cum CTF .....	09.05.2000
(iii)	Balol GGS IV .....	25.05.2000

The System has been found working satisfactorily.

*S. Kumar*  
5/7/01

(S. KUMAR)  
CE (P)

Project Coordinator

HS / MKD



TOYO ENGINEERING

MINUTES OF MEETING

PAGE 01 OF 02

JOB NO. 6218

REQ. NO.

SUBJECT : FLARE STACK

TEIL'S JOB NO. : 6210

VENDOR / CONTRACTOR NAME : M/s. AIROIL FLAREGAS (I) PRIVATE LIMITED

CLIENT / JOB NAME : M/S. DREPAK FERTILISERS PETROCHEMICALS & CORP. LTD.

TEIL'S PROJECT NAME : IPA - PROJECT

PLACE OF MEETING : TEIL SITE OFFICE

DATE OF MEETING : 23/02/2006

ATTENDANTS:

M/S. TEIL

1. MR. V. V. KATTI

M/S. DFPCL

1. MR.

M/S. AIROIL

1. MR. D. R. KULKARNI

DISTRIBUTION :

1. M/S. TEIL - HO MUMBAI
2. M/S. DFPCL
3. M/S. AIROIL

TOYO ENGINEERING INDIA LIMITED

DATE : 23/02/06

DFPCL

DATE :

AIROIL

DATE : 23/2/06



TOTO BDA

**MINUTES OF MEETING**

**PAGE : 02 OF 03**

**JOB NO : 6210**

**REQ. NO :**

**ACTION BY**

1. M/s. AIROIL INFORMED THAT AS THEY HAVE ACHIEVED THE MECHANICAL COMPLETION RELATED TO INSTALLATION OF FLARESTACK & FURTHER REQUESTED DFPCL/TEIL TO ALLOW THEM TO DEMOBILISE THEIR MANPOWER & MACHINERY FROM SITE.
2. FURTHER M/s. AIROIL INFORMED THAT THEY WILL MOBILISE REQUIRED MANPOWER DURING COMMISSIONING FOR WHICH THEY HAVE TO BE INTIMATED 5 DAYS IN ADVANCE.
3. TEIL AGREED AND ACCEPTED THE SAME AS M/s. AIROIL HAVE COMPLETED ALL THE RELATED INSTALLATION WORKS AS PER APPROVED DRAWINGS & ALSO ATTENDED THE PUNCH POINTS.
4. SUBJECTED AIROIFURTHER TEIL REQUESTED TO KEEP SOME TOOLS & MACHINERY THAT MAY BE REQUIRED DURING COMMISSIONING OF FLARE & M/s. AIROIL AGREED FOR THE SAME.

फेक्ट इंजिनियरिंग एण्ड  
डिज़ाइन ऑर्गनाइज़ेशन



**FEDO**

**FACT ENGINEERING AND  
DESIGN ORGANISATION**

**A Division of The Fertilisers And Chemicals Travancore Ltd.**

(A Government of India Enterprise)  
Udyogamandal-683 501, Cochin, India.

September 04, 1997

M/s. Alroil Flare gas (India) Ltd.,  
MFL\_site,  
Manali, Chennai - 68.

Sir,

**Sub : Supply fabrication, erection, commissioning and  
performance guarantee test of HDS flare system.**

**Ref : 1. Order No Amm/Aow/96/T-129/119, dated 11.03.96.  
2. Your letter No. Nil, dated 04.09.1997.**

With reference to your above mentioned letter regarding issue of Mechanical completion certificate for the supply, fabrication and erection of HDS flare system under above referred order, we are hereby issuing a Mechanical completion certificate for the above package.

Thanking you,

Very truly yours

for **THE FERTILIZERS AND CHEMICALS TRAVANCORE LIMITED  
FACT ENGINEERING AND DESIGN ORGANISATION.**

**V.K. ANIL**

**RESIDENT CONSTRUCTION MANAGER**

**Name of System :** FLARE SYSTEM  
**Item No :** Unit 900  
**Supplier :** M/s AIROIL FLAREGAS (I) Ltd.  
**P.O. No. :** 3020/02-012/192/7043 & 7044 dt. 23.01.94.


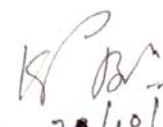
*We certify that the System mentioned above  
has been completely installed  
in accordance with specifications.*

**THE SYSTEM IS READY FOR  
PRE-COMMISSIONING.**

**Pending jobs :** (1) Operability of the Lifting Davit to be checked during Pre-commissioning.

**Reference documents :**  
*PUNCH-LIST (ENCLOSED)*

**Items included :**

HTAS	FACT	SUPPLIER
<i>1/11-97</i>  Date      Signature	<i>30.10.97</i>  Date      Signature	 <i>30/10/97</i> Date      Signature



# TOYO ENGINEERING INDIA LIMITED

TOYO HOUSE, LAL BAHADUR SHASTRI MARG, KANJURMARG (WEST),  
MUMBAI - 400 078. ● TEL. : (91-22) 579 9001 ● FAX : (91-22) 579 9061 / 62  
INTERNET SITE : [www.teil.com](http://www.teil.com)

Ref No. : PRC/6163/ 4801/P-118

Date : 20/09/2000

M/s. Airoil Flaregas (India) Ltd.,  
788 & 793, Opp. Torrent Laboratories,  
Kalol Mehsana Highway, INDRAD - 383341.  
Tal. Kadi, Dist. Mehsana.  
Attn. : Mr. M. K. Dwivedi - GM.

Dear Sir,

Subject: Successful Handing over of Ammonia Storages Facility at Dahej

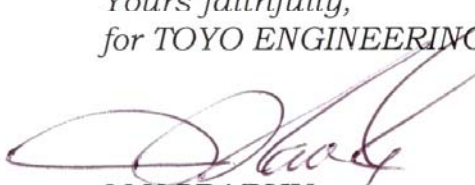
We wish to inform you that the project work including Design, Supply, Erection & Commissioning of 10,000 MT Ammonia Storage & Handling Facilities awarded to us on 7<sup>th</sup> September 1999 by M/s.Sanjana Cryogenic Storages Limited (SCSL) on Turnkey lumpsum basis at Indogulf-Birla Coppers Dahej premises was successfully commissioned and handed over to M/s.SCSL in a record time of exactly one year.

The above feat would not have been possible but for your kind co operation in Designing, Manufacturing and Delivering the items(s) ordered on you in time which enabled us to maintain the schedule as agreed with our client.

We appreciate the contribution made in by you for this project and would like to thank you for the same. Further we would seek similar co operation from you for our future projects as well.

Thanking you once again,

Yours faithfully,  
for TOYO ENGINEERING INDIA LIMITED

  
M.V.PRABHU  
H.O.D. PROCUREMENT





**AIROIL FLAREGAS** Private Limited



ISO 9001:2008 ISO 14001:2004  
FM 548440 EMS 548441

## **ANNEXURE – 8**

**COPY OF ISO CERTIFICATIONS**





# Certificate of Registration

## QUALITY MANAGEMENT SYSTEM - ISO 9001:2008

This is to certify that:

Airoil Flaregas Private Limited  
Survey No. 788 & 793  
Opp. Torrent Laboratories  
Kalol-Mehsana Highway-Indrad  
Taluka: Kadi, Dist. Mehsana 383 341  
Gujarat  
India

Holds Certificate No: **FM 548440**

and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope:

The Design, Manufacture, Supply, Installation & Commissioning of Flare Systems, Burners, Pressure Vessels and Allied Equipments/ Spares.

For and on behalf of BSI:

Gary Fenton, Global Assurance Director

Originally registered: 31/03/2009

Latest Issue: 03/04/2012

Expiry Date: 02/04/2015



Page: 1 of 2

This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract.

An electronic certificate can be authenticated [online](#).

Printed copies can be validated at [www.bsi-global.com/ClientDirectory](http://www.bsi-global.com/ClientDirectory) or telephone +91 11 2692 9000.

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization. This certificate is valid only if provided original copies are in complete set.

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 845 080 9000  
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.  
A Member of the BSI Group of Companies.



Certificate No: **FM 548440**

**Location**

**Registered Activities**

Airoil Flaregas Private Limited  
Survey No. 788 & 793  
Opp. Torrent Laboratories  
Kalol-Mehsana Highway-Indrad  
Taluka: Kadi, Dist. Mehsana 383 341  
Gujarat  
India

Production, QC, Purchase, M.R. Functions, H.R and Stores.

Airoil Flaregas Private Limited  
505, 5th Mauryansh Elanza  
Shyamal Cross Road  
Satellite  
Ahmedabad 380 015  
Gujarat  
India

Top Management, Projects, Contracts & Design.

Originally registered: **31/03/2009**

Latest Issue: **03/04/2012**

Expiry Date: **02/04/2015**

Page: 2 of 2

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A Member of the BSI Group of Companies.



# Certificate of Registration

## ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2004

This is to certify that:

Airoil Flaregas Private Limited  
Survey No. 788 & 793  
Opp. Torrent Laboratories  
Kalol-Mehsana Highway-Indrad  
Taluka: Kadi, Dist. Mehsana 383 341  
Gujarat  
India

Holds Certificate No: **EMS 548441**

and operates an Environmental Management System which complies with the requirements of ISO 14001:2004 for the following scope:

The Design, Manufacture, Supply, Installation & Commissioning of Flare Systems, Burners, Pressure Vessels and Allied Equipments/ Spares.

For and on behalf of BSI:

Gary Fenton, Global Assurance Director

Originally registered: 31/03/2009

Latest Issue: 03/04/2012

Expiry Date: 02/04/2015



Page: 1 of 2

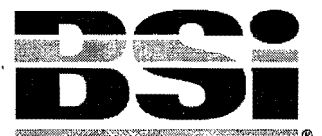
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Further clarifications regarding the scope of this certificate and the applicability of ISO 14001:2004 requirements may be obtained by consulting the organization. This certificate is valid only if provided original copies are in complete set.

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 845 080 9000  
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.  
A Member of the BSI Group of Companies.



Certificate No: **EMS 548441**

<b>Location</b>	<b>Registered Activities</b>
Airoil Flaregas Private Limited Survey No. 788 & 793 Opp. Torrent Laboratories Kalol-Mehsana Highway-Indrad Taluka: Kadi, Dist. Mehsana 383 341 Gujarat India	Production, QC, Purchase, M.R. Functions, H.R and Stores.
Airoil Flaregas Private Limited 505, 5th Mauryansh Elanza Shyamal Cross Road Satellite Ahmedabad 380 015 Gujarat India	Top Management, Projects, Contracts & Design.

Originally registered: **31/03/2009**

Latest Issue: **03/04/2012**

Expiry Date: **02/04/2015**

Page: 2 of 2

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Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 845 080 9000  
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.  
A Member of the BSI Group of Companies.



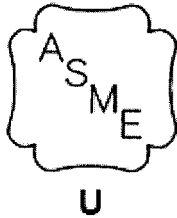
**AIROIL FLAREGAS** Private Limited



ISO 9001:2008 ISO 14001:2004  
FM 548440 EMS 548441

## **ANNEXURE – 9**

**COPY OF ASME 'U' & 'PP' STAMPS  
CERTIFICATIONS**



# CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

**Airoil Flaregas Private Limited**  
**Survey No.788 & 793, Opposite Torrent Laboratories**  
**Kalol-Mehsana Highway, Village: - Indrad, District: - Mehsana**  
**Gujarat 383341**  
**India**

SCOPE:

**Manufacture of pressure vessels at the above location and field sites controlled by the above location (This authorization does not cover impregnated graphite)**

AUTHORIZED: **May 22, 2013**

EXPIRES: **May 22, 2016**

CERTIFICATE NUMBER: **45,116**

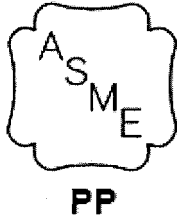
A handwritten signature in black ink, reading "Bryan A. Eiler".

Vice President, Conformity Assessment



A handwritten signature in black ink, reading "David A. Wight".

Director, Conformity Assessment



# CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

**COMPANY:**

**Airoil Flaregas Private Limited  
Survey No.788 & 793, Opposite Torrent Laboratories  
Kalol-Mehsana Highway, Village: - Indrad, District: - Mehsana  
Gujarat 383341  
India**

**SCOPE:**

**Fabrication and assembly of pressure piping at the above location and field sites controlled by the above location**

**AUTHORIZED: May 22, 2013**

**EXPIRES: May 22, 2016**

**CERTIFICATE NUMBER: 45,115**

A handwritten signature in black ink, reading 'Bryan A. Eiler'.

Vice President, Conformity Assessment



A handwritten signature in black ink, reading 'David A. Wight'.

Director, Conformity Assessment