PUNJ LLOYD

update

EPC project, Liquid Product Terminal, Jurong Island for Horizon Terminals Pte. Ltd., Singapore

EPC project, Tambora Phase II of pipeline network for Total, Indonesia

Flowlines and Well Head Installation, Bab/Bu Hasa oilfields for Abu Dhabi Company for Onshore Oil Operations

Crude Oil Terminal for Indian Oil Corp. Ltd., Paradip, India

Paradip-Haldia crude oil pipeline by HDD 1380 m, 30" dia for Indian Oil Corp. Ltd., Paradip

Design of Trace Heating for PA-B (Piltun-Astokhskoye) Offshore Platform, Sakhalin for AMEC Services Ltd., Russia

Mora Sachin Palsana pipeline including Tapi river crossing by HDD for Gujarat Adani Port Ltd., Gujarat

1000 MW power plant for Jindal Power Ltd. at Tamnar, India

NEW PROJECTS

Tunu Field Development Project – Phase 9

At PT Punj Lloyd Indonesia

high priority is placed on health, safety and environment. TOTAL E&P Indonesie awarded the EPC contract for Tunu Field Development – Phase 9 to PT Punj Lloyd Indonesia. This was the fourth in the series of Tunu Field projects, over eight years in Indonesia. Our track record, availability of marine equipment and unrelenting safety standards made us the best choice.

Tunu is a gas and condensate field in East Kalimantan, Indonesia on the outer margin of the Mahakam delta, partially onshore in swamp and offshore in shallow waters.

The Mahakam Delta is infamous for its shallow sea with excessive surface currents. The inner delta, criss-crossed by rivers, is inhabited by salt-water crocodiles, snakes and other reptiles.

We deployed our fleet of marine equipment comprising 'purpose built' barges, amphibian equipment, shallow tugs and dredgers with a draft of one meter.

Pipe pull operations from GTS 'Y' to shore line

A detailed hazard identification and risk assessment was conducted by our HSE team.

The pipeline (20" dia) 2000 m long had to be laid from the shoreline (KP 2000) to the offshore platform GTS 'Y' at KP 0. The pipe string was fabricated in an inshore trench in two sections of 1300 m and 900 m, due to insufficient length inshore.

We encountered offshore very rough weather with currents exceeding 8.5 knots. Lateral guide piles were driven 50 m along the entire length, in two rows 3 m apart. This was to arrest the excessive movement of the pipe string during high tide. Special custom built poly buoys were attached to the pipe string to make the string buoyant during the pulling operations.

A Work Barge 120' in length, with a four point mooring system was positioned to pull

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achieved 85.7 per cent the highest HSE rating among the contractors working for TOTAL in Indonesia

the string. The barge is equipped by Dual RTK, GPS and barge management systems for accurate positioning and is mounted with a 7 T winch carrying a 1500 m wire rope and a 75 T crane.

The entire offshore area was very shallow with clusters of sand dunes which were displaced during spring tides. The presence of sand dunes necessitated pre-trenching prior to the pulling operation. A cutter suction dredger was deployed to carry out the pre-trenching operations.

The wire rope was laid with a special push-boat less than 3 m wide, which enabled it to move between the two lateral guide piles.

Pulling operation

The pulling operation commenced with the first string of 900 m being pulled offshore. The tie-in of the two strings was carried out in the inshore swamp trench. The pipe pull head was at KP 1350, with 750 m of the pipe section pulled offshore. Four flexiyoke barges 32 T SWL with two swamp excavators were deployed to carry out this specialised tie-in inshore.

This inshore activity was tide dependent and the

Scope includes engineering, procurement of all material like line pipe, fittings, pile pipes. The pipeline details are:

- 20" OD 19.05 mm CC API 5L Gr. X-65 — 15.7 km
- 8" OD 18.6 mm API 5L Gr. X-65 — 1.7 km

To be laid as follows:

- Shore Approach by Surface Pull — 2 km
- Offshore conventional — 3.2 km
- Offshore Push Pull — 2.7 km
- Swamp Push Pull — 5.4 km
- HDD in Swamp with Rig mounted on Barge — 4.1 km

movement of flexiyoke barges was possible only during high tide. Tie-in and other associated activities like radiography and field joint coating were also performed during suitable tides.

The pulling operation resumed after the successful completion of the tie-in. The barge was re-positioned at GTS 'Y' (KP 0) platform and the wire rope with pull head was laid at KP 1350. The string was regularly monitored for buoyancy aids so that the load on the winch did not increase its SWL. Underwater divers were deployed to constantly check the position of the pull head with respect to the pipe's centerline.

Installation of Risers and Doglegs

Five platforms of risers and doglegs were to be installed with pipes of 8” and 2” and 20” piggy back line. The newly acquired 230 ft barge with a deck loading capacity of 10 T/m^2 was fitted with four davits each for SWL of 35 T, supported on a four point mooring system. The winches have a 35 T rating with a drum capacity of 900 m. Two 150 T and 50 T cranes were mounted on the barge in order to carry out the installation of riser and dogleg assemblies.

The installation involved connecting previously laid trunk lines on the platform while they were held in position vertically, using special riser clamps. The offshore pipelines are laid with an accuracy of ±5 m. A comprehensive metrology is performed by divers on the actual position of the laid pipeline, based on which the doglegs spool is fabricated on the barge. The final tie-in is done in 2 G position at the location above the riser clamp. Pipelaying on an existing pipe rack is a critical activity as it is carried out within a confined space and is parallel to the pipeline.

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2.35 million safe man-hours were achieved on this project

Offshore Shallow Water Push Pull Operations

For the shallow water pipelaying, we developed a technique where the seabed was shallow and conventional pipelaying was not possible. Lateral guide piles of 16” dia were driven at 30 m intervals spaced 5 m apart, to arrest the excessive movement of the buoyant pipe string. This was laid using a shallow water pipelay barge.

After the successful push-pull operation, the pipe string was lowered and the section jetted down to achieve the required cover.

Horizontal Directional Drilling

Another milestone successfully achieved was the laying of a 2000 m stretch of pipeline by Horizontal Directional Drilling method. The pipe string had to be prepared and wet stored in the open sea with currents of 3 knots.

Project	Safe man-hours
Tunu Phase 4 & 5	0.85 million
Tunu Phase 7	0.31 million
Tunu Phase 8	1.12 million
Tunu Phase 9	2.35 million

Safety

We launched a programme to reinforced safety awareness, stringent standards and create an incident-free work environment.

At each stage the emphasis was on Q&HSE. At an audit conducted TOTAL E&P Indonesie for the high risk category, we achieved 85.7 per cent, the highest HSE rating among the contractors working for TOTAL in Indonesia.

PT Punj Lloyd Indonesia has been accredited ISO 14001:1996, OHSAS 18001:1999 and 2.35 million safe man-hours were achieved on this project in 2004.

Innovative thinking supported by dependable safety construction engineering enabled PT Punj Lloyd Indonesia to surmount challenges with Q&HSE.

✦ A Rajendra

extensive experience and expertise

The construction of two LNG storage tanks, each having a capacity of 160,000 m^3 was awarded to us on May 2002. Our ability to deliver excellent quality while maintaining safe and secure working environment, we have achieved 4 million accident free man-hours in the execution of this project.

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airlifting of a heavy dome roof in one and a half hour

Punj Lloyd was awarded the contract for construction of two cryogenic tanks by The Hazira LNG Pvt Ltd (HLPL), a subsidiary of Royal Dutch Shell group of companies. The LNG storage tanks of 80 m dia. and 40 m height have a capacity of 160,000 m^3 each and storage temperature of -165º C.

Our extensive experience and expertise in the field of cryogenic tank construction coupled with the fact that the first LNG terminal in India was also constructed by Punj Lloyd won us this contract in spite of tough international competition. Logistics was a challenge as a huge quantity of aggregate had to be transported to the site from a distance of 150 km. The transportation was carried out under an international standard logistic management system without any lost time injury (LTI).

Hazira LNG Tankage Project Funded by UCO Bank

Scope of work

RCC wall construction, 40 m height
Erection of tank roof structures
Erection of aluminum suspended decks
Air lifting of 770 MT metallic roofs
Erection and nickel welding of inner shell plate, 11 shell course
Insulation of tank base slab and suspended deck
Insulation blanketing for tank shell plate in annular space
Erection of tank roof top structures
Erection of inlet and outlet pipelines from tank to jetty and terminal
Hydro testing of pipelines at site and fabrication yard
Hydro testing of tanks

LNG re-gasification terminal, hazira

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A glimpse into some of the volumes will give an idea of the scale of this project,

Concreting 33864 m^3

Steel used for reinforcements 4680 MT

Airlifting of tank roofs weighing 770 MT

Erection of nickel plates and associated structures of the tanks 6838 MT

update

project earned us international recognition

A computerised 120 m^3 and two standby 30 m^3 concrete batching plants were installed at site. Rail track and truck mounted concrete placer boom were placed for fast and safe concreting . Two tower cranes, 75 m high with a capacity of 12.5 T were used. One passenger hoist along with two stair towers were installed at each tank for safe access to the working platform at elevation and tank rooftop.

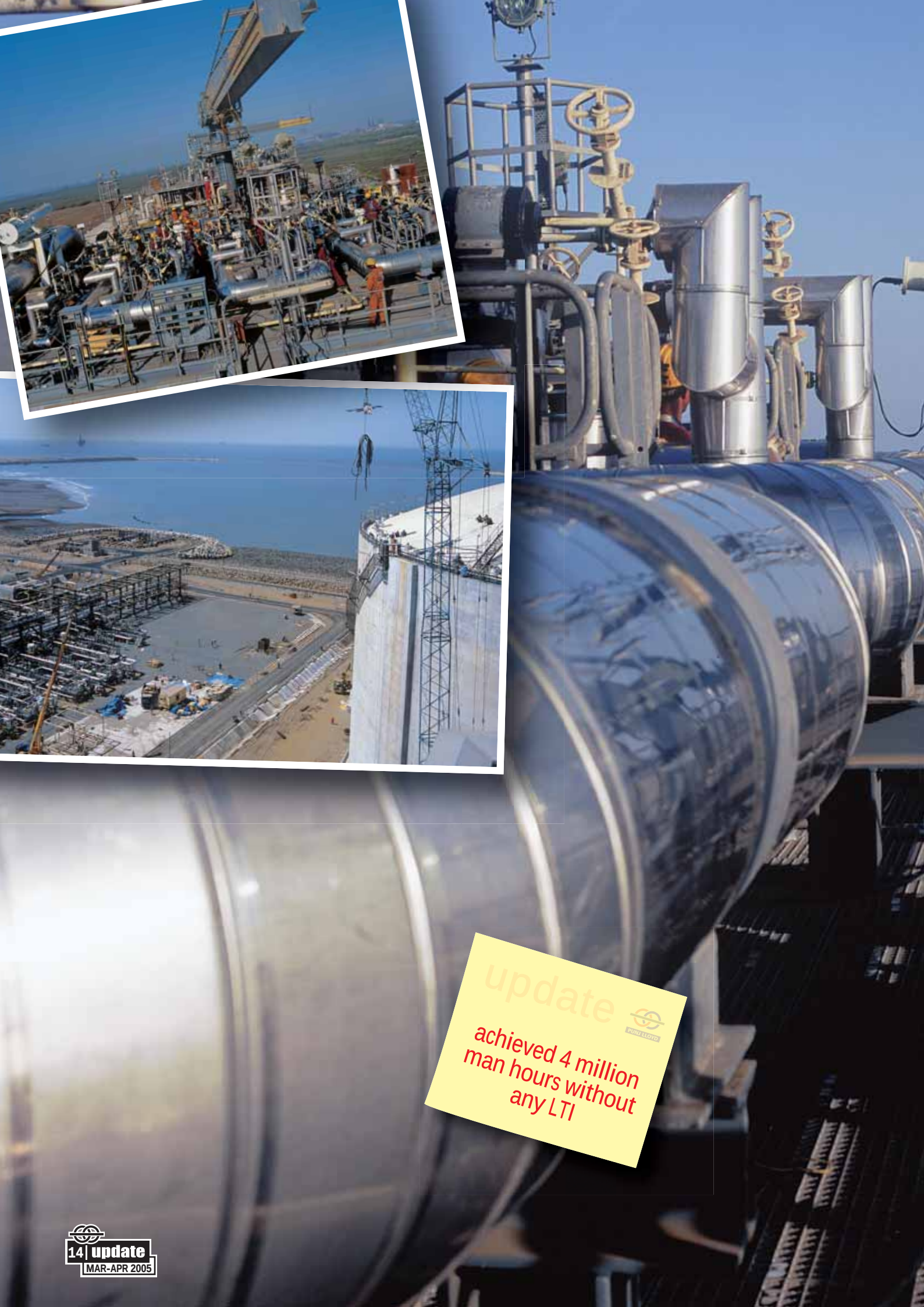
The airlifting of the dome roof of a tank is a highly complicated activity fraught with risks. Roof weighing 770 T was lifted with air pressure of 146 mm of water column to a height of 34.03 m in 2 hr 40 min. The second roof was airlifted in a record time of 1 hr 38 min. This is the fastest air lift of a dome roof of such proportions in India.

The tank was purged with Nitrogen. Inerting was carried out at a volume of 180,000 m^3 till the oxygen level was brought down to less than 5 per cent. The Q&HSE team carried out air quality and noise level monitoring as per OSHA's guidelines.

Safety aspects were of paramount importance during this activity. A distance of 100 m around the tank was cordoned off.

The project is under commissioning and has started receiving LNG. We have earned international recognition due to our LNG construction expertise and stringent Q&HSE standards.

♦ Rakesh Syal and R Teja


update
achieved 4 million
man hours without
any LTI

Safety Management at Hazira

Punj Lloyd maintains a healthy, safe and pollution free work environment at its sites worldwide. We worked 4 million man hours without any LTI.

Risk assessment and management

Risk assessment and job safety analysis were mandatory. Once the risks had been identified, control measures were put in place before commencement of work.

All site personnel were responsible for identifying and dissolving hazardous situations. Hazard report forms were made available to operational personnel. If an identified hazard could not be rectified immediately, the affected area was barricaded and warning signs displayed to minimise the consequences.

More than 8442 people were inducted at site. Daily morning toolbox talks at different work locations by supervisors was a regular practice, 359,918 work heads participated in the toolbox talk.

Safety Audits

Management and supervisory personnel carried out continual Health & Safety surveillance. Regular internal and external safety audits were carried out and reports forwarded to the project manager with recommendations. Q&HSE audits were carried out every six months.

Training

To achieve our safety objectives and to meet the Zero Accident Targets, Q&HSE training was regularly organised at site.

New incumbents were imparted safety induction and orientation training before starting work.

Specialised workshops on safety management techniques and systems with the help of external agencies were also organised as per the training plan.

Environment

Work environment air sampling and testing was regularly conducted and several drinking water points were established at site for supplying potable water as per WHO recommendations. Hazardous and Non-Hazardous wastes were collected, segregated and disposed off as per the guidelines of the Gujarat Pollution Control Board.

Additional Measures of Safety

Each month one work group was awarded for best Q&HSE performance. Promotional and motivational safety activities were held under the chairmanship of various outside dignitaries. Emergency teams were constituted with their defined role and responsibilities during an emergency and functioned effectively.

♦ N F Siddiqui and P Kundu

HCE
Hazira Cryogenic Engineering & Construction Management Private Limited
Hazira Marine Engineering & Construction Management Private Limited
HME
Date : 25th May, 2004
Reference: HCE/PLL-TANK/S/1827
Punj Lloyd Limited
Punj Lloyd House
Plot N 306/A-1
Near Light House
Taluka - Chorasi
Surat 394 270, INDIA
For the attention of Mr R.Sen – Project Manager
Project: HAZIRA LNG AND PORT PROJECT – PH10/04/HAZ
Work Package 8 to 13 - Tank Construction Works
Subject: Safe Workplace Achievement
Dear Sir,
Manager identifies that Work Contractor has achieved 3,013,712 man-hours on the 8 - 13 Work Package without sustaining a Lost Workday Case.
Manager commends the management of the Work Contractor for displaying a positive and pro-active role in supporting the OWNER and Manager goals of obtaining an accident free, safe place of work, whilst operating under the pressures of quality and schedule adherence.
Yours faithfully,
Christophe Hirsinger
Project Director,
Hazira Cryogenic Engineering & Construction Management Private Limited.
Attachments: None
cc: CDE, JPC, CLR, CDP, HSES File
File No: 703-1.1.16
RECEIVED
28 MAY 2004
BY
Hazira Cryogenic Engineering & Construction Management PVT Ltd
C/o Shell Hazira Gas Pvt. Ltd. ADG Terminal Site, Next to Well No. 7, GSPCL, Hazira, Surat, Gujarat, India

Spectranet Convergent Broadband Solutions Provider

Spectranet has been awarded ISO 9001: 2000 and BS7799 certificates by DNV. This makes Spectranet the 2nd Service Provider in India and the 4th in Asia to have this independent quality certification.

Punj Lloyd pioneered the future of broadband communications, entertainment, education and convergence in India. In 1995, Spectranet was incorporated as a division of Punj Lloyd, ushering in a new era of convergence in India. Spectranet is a Category A all India Internet Service Provider, a Licensed Cable Service Provider as well as an Infrastructure Provider Level - I.

Pioneers of broadband, Spectranet is India's 1st private Broadband Convergent Service Provider. Spectranet has built out 1,177 km of duct containing a 424 km optical fibre based IP network covering the National Capital Region (NCR). Spectranet has also built duct in Bangalore and Chandigarh. Through this OFC network and using our interconnectivity with all other telecom networks, we offer the following convergent solutions:

Satisfied corporates

Galileo, Amadeus, National Geographic Channel, NDTV, CNN, BBC, GAIL, Railtel, ADOBE, Ebookers, Spectramind, Reebok, LG, Max HealthCare, Doordarshan, MacDonald's, Fidelity, Connor, TIME, CNBC, Taj Hotels, Hewitt, MTV, Escorts, Maruti Suzuki, HUTCH, Airtel

Broadband IP Internet access services

Spectranet is a broadband services consultant and service provider, offering a range of bandwidth solutions. From basic email to call centres alongwith the managed, usage based requirements of telecommunication companies and ISPs, Spectranet has successfully provisioned services across vertical segments. We are among the top four ISPs in India who commissioned an international STM1 backbone.

Analog/Digital Cable TV Services and Video Uplink

The election telecast in Delhi was carried out using Spectranet network and solutions. News Channel vans may soon be redundant, faced with the revolution in data transfer through 270 mbps broadband links. Concepts of virtual studios and news gathering have become a reality for India, thanks to Spectranet.

Virtual Private Network based Intra Corporate Networks

Using its network and world class technologies, Spectranet makes the world a smaller place. Whether it is two offices in the city or in different countries, Spectranet connects them in a secure and cost effective way.

Digital Satellite Earth Stations

Spectranet facilities are used by broadcasters for uplinking. These are cost effective and offer high speeds with high service standards .

Data Centre Services

Spectranet was one of the few of ISPs to setup a Tier-3 data center facility in India. Facilities include customised physical environment, raised floors (24"), HVAC temperature and moisture control, biometric access security systems, 24 hour security, seismically safe building and fire protection systems.

Our Partners

Spectranet's technology partners are world leaders in their respective fields of service/product design and delivery. Spectranet delivers customer centric services using systems and equipment provided by technology leaders like General Instruments, Sun Microsystems, Compaq, Lucent Technologies, Juniper and Cisco Systems.

Our Associates

Spectranet is privately peered with other telecom networks, channel partners and ISPs.

Our Resources

Spectranet's Human Capital resource pool includes experienced broadband engineers. Spectranet's rich lineage of clients are spread across 18 vertical segments. A 24x7 call centre and Technical Helpdesk ensures prompt problem solving. Spectranet can deliver services not only within India but across the world.

◆ Raminder Mamik

Training at Punj Lloyd

Training is the foundation of an organisation. Constant training helps us retain our competitive advantage. To compete on an international platform we provide appropriate and continuous training to build the skills of our people.

Training includes a broad range of advanced and result-oriented programs designed to cater to the contemporary needs of the construction industry. Our focus is Q&HSE training and extends to technical, behavioural, ERP and management.

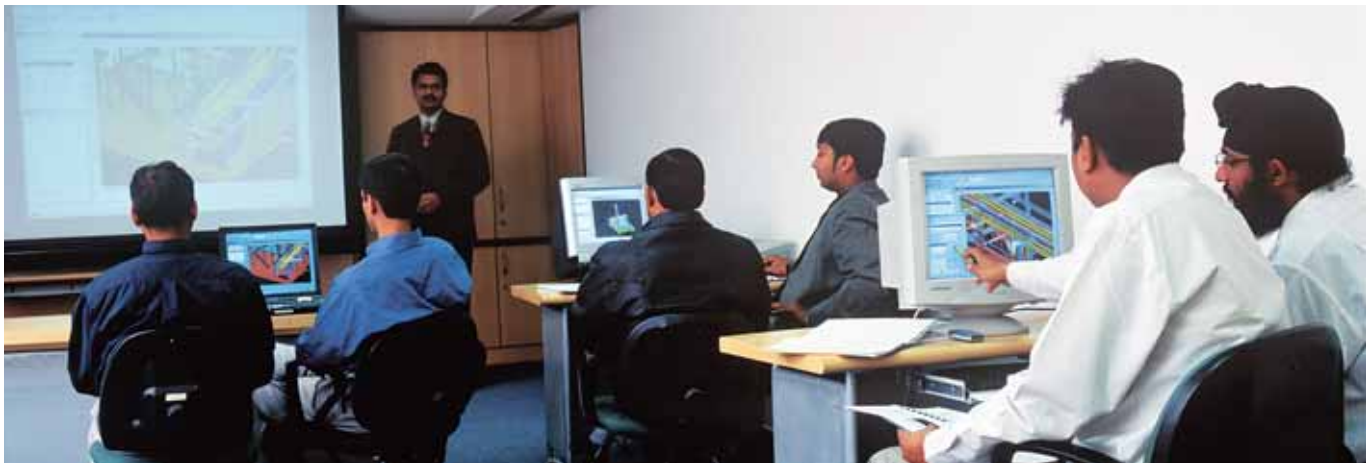
At sites the Q&HSE department conducts refresher courses regularly. These comprise both classroom and hands on sessions, at the end of which performance is strictly evaluated. Our Q&HSE team is ever vigilant and whenever required, they are prompt to organise another round of training. Each employee goes through several rounds of training in keeping with the culture of the organisation.

Training at site is supported by safety drills and acknowledging exceptional Q&HSE performance with client & management rewards.

For successful marketing and completion of our projects across the world, cross-cultural management is another subject which we cover in training. In a year, the target is to provide six days of learning experience to each of our employees.

One has to constantly learn and evolve to be part of this active cycle and we endeavour to facilitate that process for all employees.

◆ Shampa Gan Chowdhury
and Priyanka Nanda



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ILTA Independent Liquid Terminals Association
P·E·P·C SYNERGY IN PROJECT EXCELLENCE
Construction Industry Development Council
OPAL OMAN SOCIETY FOR PETROLEUM SERVICES
CFI CONSTRUCTION FEDERATION OF INDIA
DNV ISO 9001 : 2000 QMS
ISO 14001 : 1996 EMS
OHSAS 18001 : 1999 OHSMS