



**PUNJ LLOYD**  
**update**



Backwater and onshore pipeline for Kochi Refineries

Dahej-Uran Pipeline for GAIL

Mundra-Delhi pipeline for HPCL

Fuel Systems for New Doha International Airport, Qatar

Completion of LNG terminal and jetty facilities in JV with Whesoe for Ratnagiri Gas and Power

Elevated Viaduct and 4 stations for DMRC

Multi-speciality hospital for Global Health Pvt Ltd

Another highway project in Rajasthan for RIDCOR



Dahej LNG Tank Expansion project for Ishikawajima-Harima Heavy Industries, Tokyo

Bulk liquid storage and blending facility at Meranti, Jurong Island for Helios Terminal Corporation, Singapore



# Spreading our wings...

## Punj Lloyd acquires SembCorp E&C

**"I hope to see Punj Lloyd as one of the top five global EPC companies in the next five years....'Top 5 in V" were the words of Mr Atul Punj, Chairman & MD on the event of the Company's acquisition of SembCorp Engineers & Constructors (now Sembawang E&C), Singapore on 2nd June 2006.**

**South East Asia's** largest engineering construction company, outside Japan, China and Korea, SembCorp E&C offers comprehensive one-stop solutions to clients in sectors like Petrochemicals, Oil and Gas, Civil Infrastructure, Transportation, Utilities, Pharma and Biotech.

Offering complete project delivery, starting from concept to commissioning, SembCorp's capabilities include a vast spectrum of engineering and construction services like feasibility studies, concept design, front end engineering design & master planning, basic and detailed engineering design, procurement and construction.

The Company has a long history in the successful implementation of technology projects and has a portfolio of prestigious technology providers like ICI, BP, Exxon, Basell, among others. Excited at the



acquisition, Mr Punj said that for Punj Lloyd, which currently operates in 6 verticals namely cross country pipe laying, tanks and terminals, process facilities, highways, power plants and high end buildings, this will add on various verticals like airports, jetties, water and sewage treatment, Special Economic Zones, MRT/LRT etc. It's the start of a beautiful symbiotic relationship.

Besides the addition of new geographies, there is a huge pool of human resources which will now be available to Punj Lloyd, together with enhanced design expertise. One of Punj Lloyd's greatest assets is the acquisition of the

jewel in the engineering and construction sector – Simon Carves, SembCorp's wholly owned subsidiary in Manchester, UK. Simon Carves was one of the oldest names in the area of petrochemical construction and with the huge amount of expansion in petrochemical work not only in India but also in the Middle-East, South East Asia and North Africa, there is a massive opportunity for Punj Lloyd to expand its business.

The opportunities now open to the Company as a result of the acquisition, have multiplied manifold. A large amount of off-shoring opportunities will be available to Punj Lloyd. The senior management at Punj Lloyd has been interacting with that of SembCorp E&C and Simon Carves on various occasions. Punj Lloyd extends a warm welcome to SembCorp E&C and Simon Carves employees to its fold. ♦

### Partnering together

Punj Lloyd has formed a joint venture with His Royal Highness Prince Khalid Bin Bandar Bin Sultan, Kingdom of Saudi Arabia. The jointly owned company, with a share capital of 2 million Saudi Riyals, would be named 'Dayim-Punj Lloyd Engineering Limited' in which Punj Lloyd would hold 49 per cent. HRH Prince Khalid Bin Bandar Bin Sultan will be the Chairman of the joint venture.

Dayim-Punj Lloyd Engineering Ltd will operate in engineering, procurement, construction, commissioning of onshore and offshore projects for the hydrocarbon, power, chemical, water and sewage sectors, civil infrastructure and industrial projects in the Kingdom of Saudi Arabia.

The formation of this 49:51 joint venture will provide Punj Lloyd a greater opportunity to participate in the mainstream of the Saudi Arabian market. ♦





# Cryogenic Storage Tank Package at Jamnagar Refinery

Punj Lloyd has recently completed the construction of the cryogenic storage tank package at the Reliance Jamnagar refinery. Awarded to the Company in 2004, this repeat order, spoke volumes of the confidence and trust the clients had in the capabilities of Punj Lloyd to deliver high standard infrastructure solutions. The job entailed the complete EPC of the cryogenic tank at the refinery. The Company had earlier constructed a similar double-walled low temperature LPG/Propylene tank at the Reliance Jamnagar refinery.









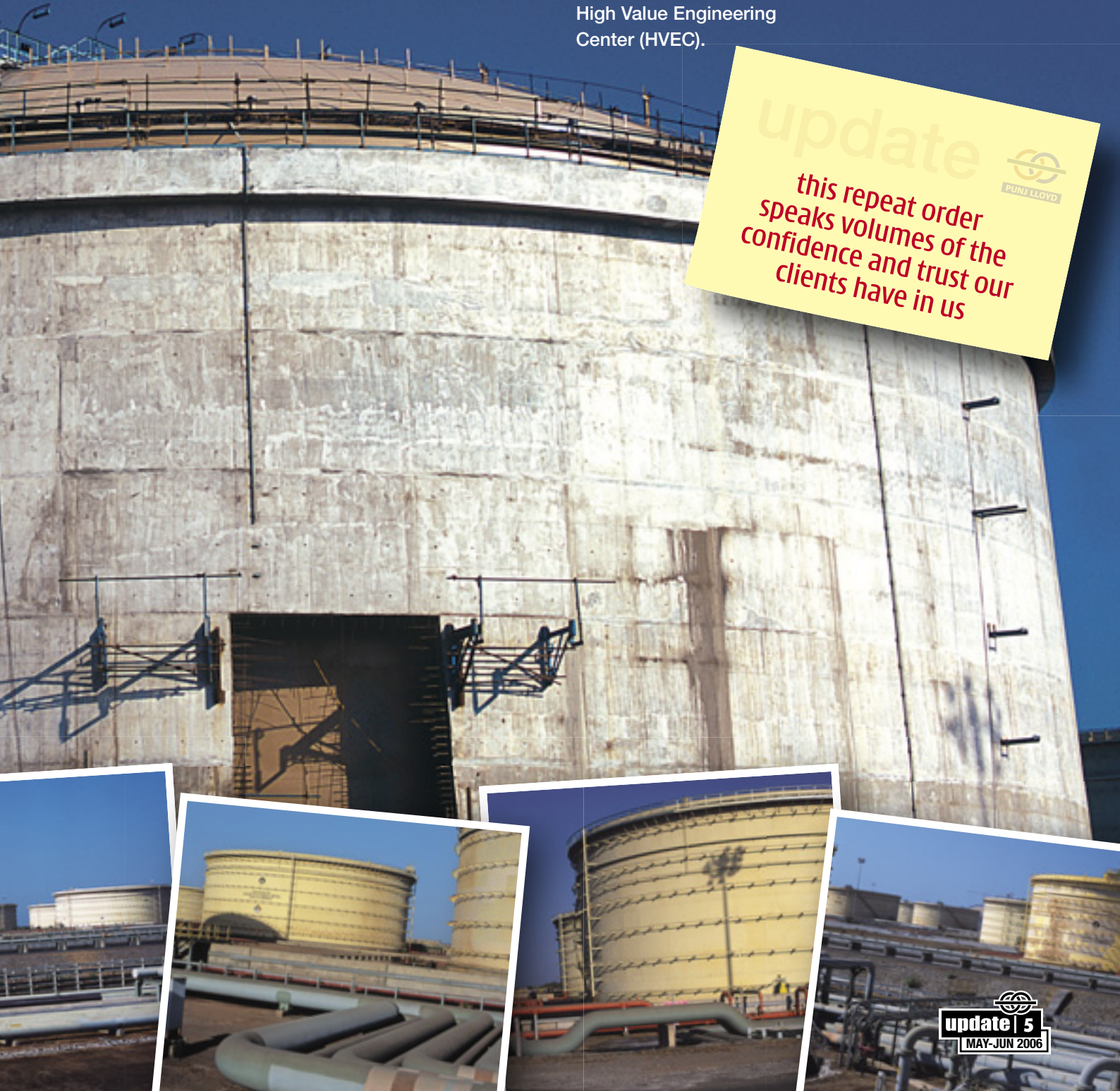
Reliance Industries, under the Value Maximization Project (VMP), expanded the capacity of the FCC, unsaturated gas concentration unit, the delayed cocker and relevant gas

concentration unit to increase the production of Liquefied Petroleum Gas (LPG) from ~7,000 T/d to 10,700 T/d. To augment the storage capacity of LPG due to the increased production, the storage

facility in the form of a double wall cryogenic vessel was conceived by Reliance.

While the basic design was carried out by Whessoe Oil and Gas Ltd., UK, the detailed engineering was done by Punj Lloyd's own High Value Engineering Center (HVEC).

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## Achievements

**Tank shell erected with max. load handled in a single lift by 72 hydraulic jacks of 25 MT capacity - 1200 MT in 3 hours**

**Total man-hours spent without any LTI 1.85 million**

The tank, with a capacity of 38,230 m<sup>3</sup>, is a dome roofed double integrity refrigerated storage tank. The internal shell has a diameter of 54.18 m and a height of 18.50 m, almost half the size of a football field. Due to low temperature of the internal container, special material in the form of 1% Ni-Steel plates was used. Welding these metallurgical complex plates, under stringent inspection, was a big challenge. The outer shell encasing has a diameter of 55.95 m with a height of 20 m. Erection, carried out by the jacking method, required intricate planning and implementation skills. 80 jacks each of 25 MT were pressed into service. Shell height of 20 m was achieved with clockwork precision by logistical planning which included establishment of the work flow from receipt of the material, rolling and prefabrication, carriage to work site and installation at the location.

The annular space between the two shells was filled with perlite, a material that inhibited heat transfer, thereby allowing the liquid inside to remain at low temperature (-48° C). The specialised job of insulation was

carried out by Punj Lloyd Insulations Ltd., a subsidiary of Punj Lloyd Ltd. The outer steel shell was surrounded by a 400 mm thick outer concrete wall to protect it against other energy sources and hazards. The sheer volume of concrete work was handled deftly

to achieve the task, ensuring high quality under strict surveillance.

Substantial material had to be imported and therefore required sufficient lead time. Logistical problems were compounded as the site witnessed unprecedented rainfall. In spite of the handicaps

posed by inclement weather and vagaries of the arrival of the imported supplies, the sheer grit and perseverance of the Punj Lloyd team saw through the successful mechanical completion of the cryogenic tank.

◆ P S Bose







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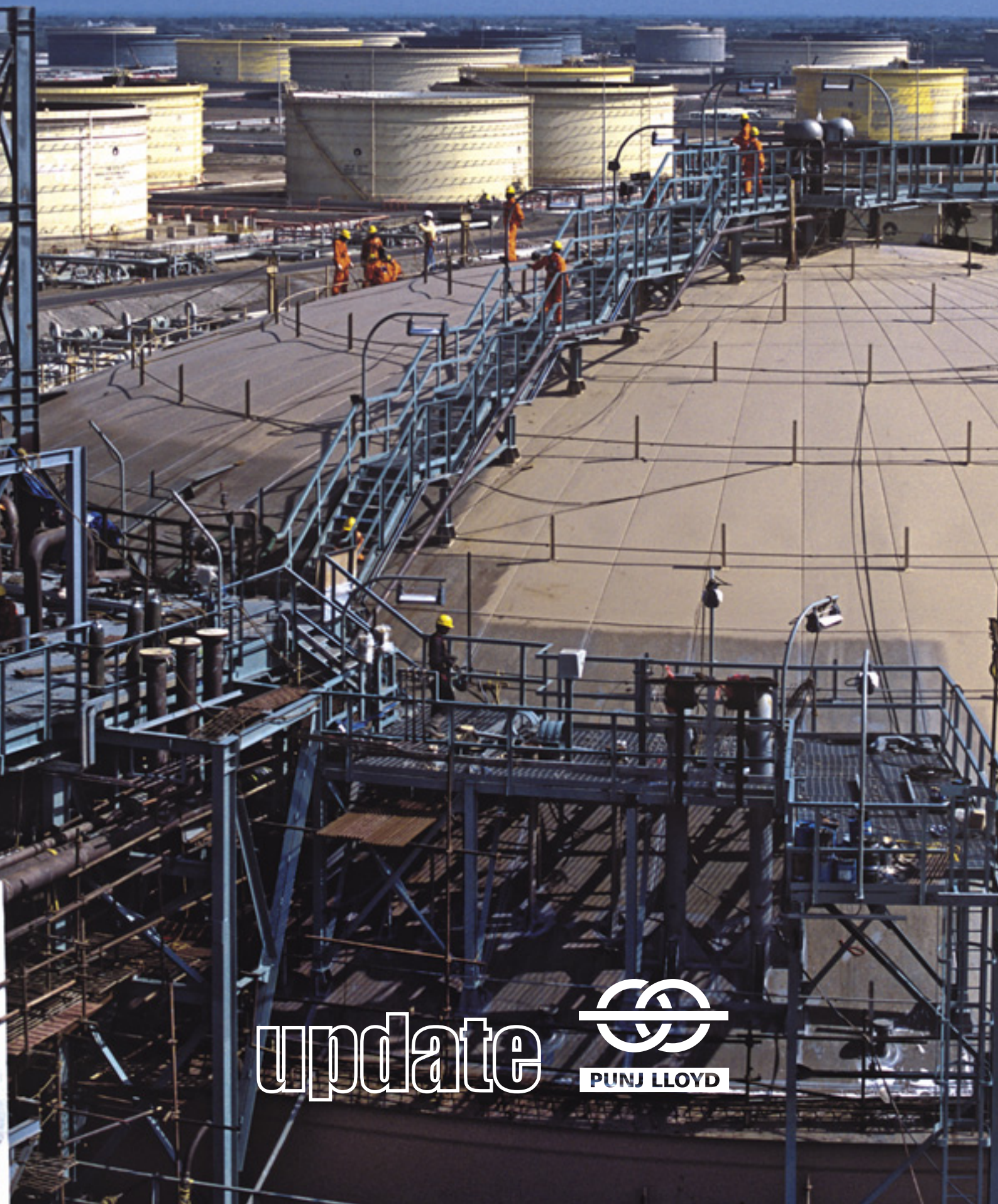








# Cryogenic Storage Tank Pack



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# age at Jamnagar complex







SERVICE: PETROCHEMICAL NAPTHA  
CAPACITY: 425100L

TANK NO: 840 100L  
SERVICE: PETROCHEMICAL NAPTHA  
CAPACITY: 425100L

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# Paradip Haldia Crude Oil Pipeline Project



**Punj Lloyd is nearing** completion of the double deck floating roof and cone roof fire water tanks for the IOCL Paradip Refinery. These tanks are being constructed for storing crude oil which will be unloaded from large ships at sea in Paradip. The draught of the sea at Haldia is considerably low, preventing large ships (with crude oil) from docking. This oil is unloaded and stored at Paradip and later transported to Haldia by a newly laid pipeline where

Punj Lloyd has done extensive HDD under the river along the entire route.

The scope of work involved design, fabrication and erection of seven double deck floating roof tanks, each of 60,000 KL capacity and two cone roof fire water tanks, each of 30,000 KL capacity at the IOCL Paradip terminal, part of the planned refinery.

## **Cone Roof Fire Water Tanks**

The construction of the Cone Roof Fire Water

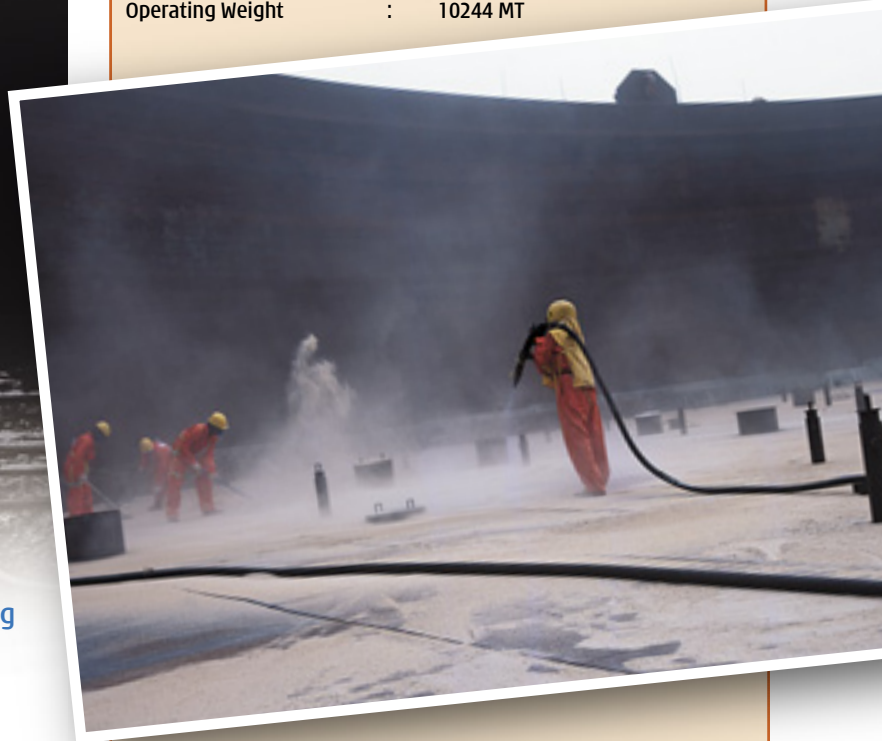
tanks involved utilisation of free issue plate material for tank shell, bottom, wind girders, appurtenances and roof plates. The thickness of the shell plates varied between 18 mm (1st shell course) to 6 mm (10th shell course). Bottom plates were 8 mm thick, while the annular and roof plates were 10 mm and 5 mm thick respectively. The structural member constituting the roof structure and the required consumables were within the scope of our supply.



Financed by IDBI Bank

### Cone Roof Fire Water Tanks

Number of Tanks	:	02 nos.
Tank	:	FWT 01 and FWT 02
Tank Internal Diameter	:	30 m
Height of Tank	:	14.5 m
Service	:	Fire Water
Code	:	API 650, 10th Edition, Nov 1998 Amendment 3, Sept 2003
Nominal Capacity	:	10000 KL
Erection Weight	:	244 MT
Operating Weight	:	10244 MT



Punj Lloyd had the responsibility for the mechanical construction of the tanks wherein the tank pad foundations were to be handed over to us by the client. The tanks were constructed following the 'jacking methodology'. The total erection weight of the tank bottom plates and shell plates for each tank was 48 MT and 125 MT respectively, while that of the roof 62 MT. The tank was calibrated after completion of the hydro-test cycle.

### Double Deck Floating Roof Tanks

Construction of the double deck floating roof tanks also involved utilisation of free issue plate material for tank shell, bottom, deck, wind girders, appurtenances and foam system plates. The thickness of the shell plates varied between 32 mm (1st shell course) to 10 mm (6th shell course). Bottom plates used were 8 mm thick while the annular plates were 14 mm thick and

### Double Deck Floating Roof Tanks

Number of Tanks	:	07 nos.
Tanks	:	PT-06, PT-08, PT-10, PT-12, PT-13, PT-14 and PT-15
Tank Internal Dia	:	79 m
Height of Tank	:	13.5 m
Service	:	Crude Oil
Code	:	API 650, 10th Edition, Nov 1998 Amendment 3, Sept 2003
Tank Capacity	:	60,000 KL
Erection Weight	:	1,421 MT
Operating Weight	:	52,460 MT
Hydro-test Weight	:	61,466 MT



deck plates 5 mm and 6 mm thick, while the plates utilised for wind girders varied between 14 mm to 10 mm thickness. Appurtenances and its accessories were constructed utilising plates having thickness between 5 mm to 32 mm. Plates utilised for foam deflection were fabricated with 10 mm thick plates. The structural member for the deck structure, spiral stairway, walkway, rolling ladder, foam seal, roof drain and all the required consumables were supplied by us.

Responsibility of mechanical construction of the tanks lay with us. The total erection weight of the tank bottom plates and shell plates for each tank was 337 MT and 433 MT respectively, while that of the roof 529 MT.

After completion of erection, welding of all the six shell courses, deck plates and structures, the double deck floating roof is initially airlifted to the maintenance level height of 2 m. Anti rotation devices, gauge-well assemblies, rolling ladder



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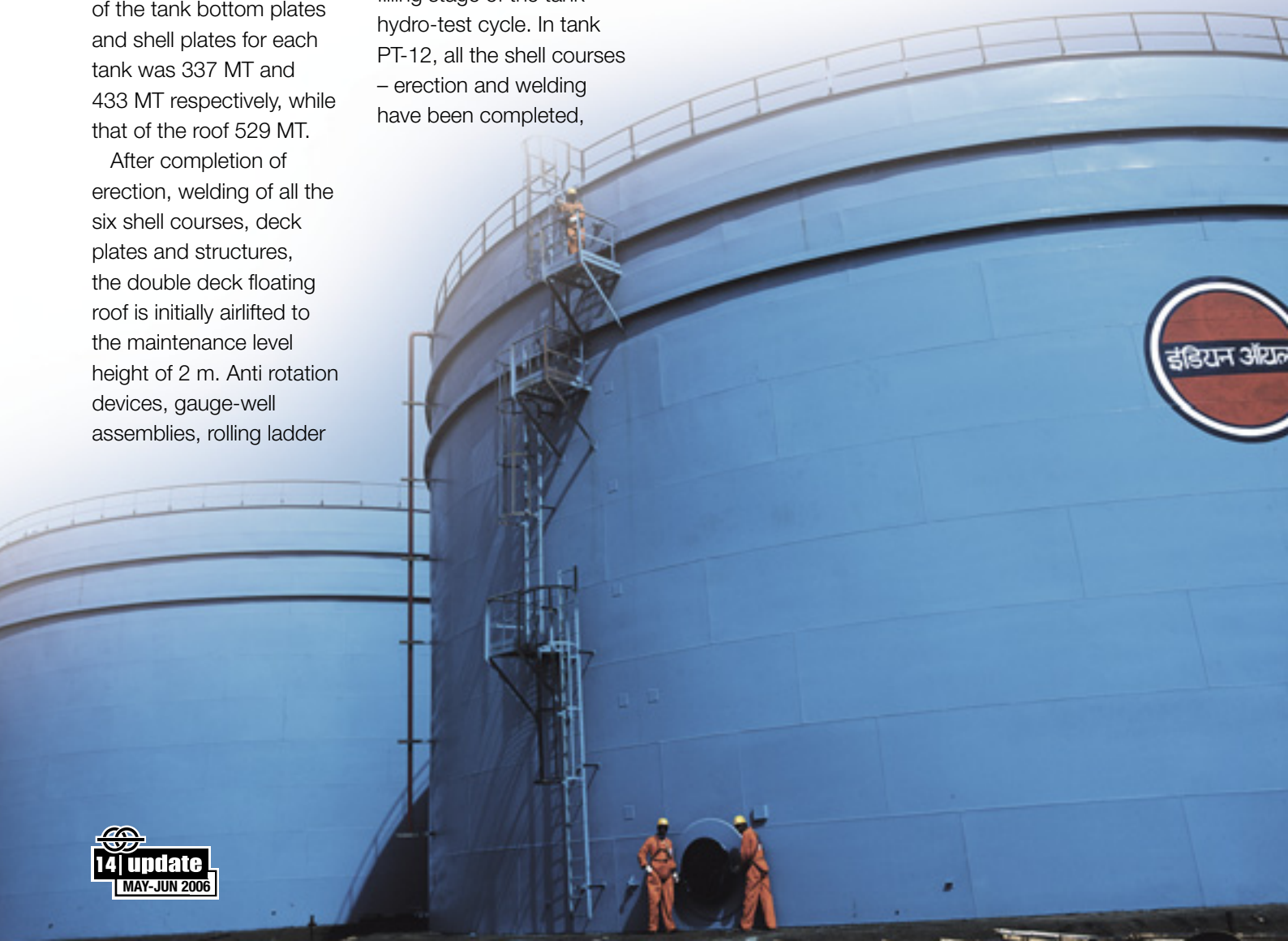
**seven double deck floating roof tanks each of 60000 KL capacity**

installation is completed after initial lifting of the deck and prior to water filling for tank hydro-test.

Three tanks, PT-06, PT-08 and PT-13, are in the final stages of completion. Tanks PT-15 and PT-10 are in the de-watering stage while PT-14 is under the filling stage of the tank hydro-test cycle. In tank PT-12, all the shell courses – erection and welding have been completed,

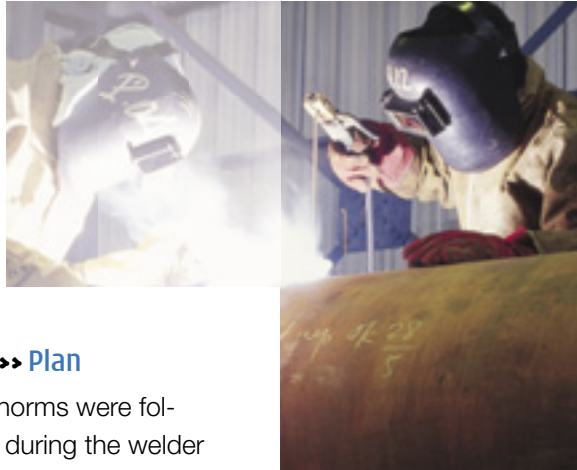
while the erection and welding of the upper deck plates of the roof is under progress. Initial airlift of the deck shall be done after the completion of deck erection welding.

♦ Rajat S Sen





# Quality reinforced



**Punj Lloyd has always** considered Quality Management as one of the crucial steps towards customer satisfaction. Keeping quality a top priority the Punj Lloyd team at the Pune-Sholapur pipeline project (PSPL) Spread - I has achieved a weld repair rate below 0.3%. The team had to weld a 14" API 5L GR X56 pipe, 182 km long, with a wall thickness of 6.4 mm and 9.5 mm respectively. Putting to work Deming's PDCA - Plan-Do-Check-Act, we achieved high quality performance through the following steps:

## STEP 1 >> Plan

Strict norms were followed during the welder qualification process. The QA/QC team at the site made a detailed presentation to the welders, which included a physical demonstration of the welding operation.

## STEP 2 >> Do

In cross-country pipelines, the welding is extremely critical, hence various parameters had to be monitored:

- Welding machines were checked periodically to ensure steady voltage output
- Lincoln Cellousic electrodes E6010G and E7010G were used

- Care was taken while handling electrodes to ensure they remained dust-free
- A lightweight, insulated welding holder and a flexible welding cable were used to provide easy maneuverability
- Lincoln Electric Inventec V350-PRO welding machine was used
- Care was taken to train the welder assistant, as he plays a crucial role in the adjustment of voltage
- The entire welding crew was encouraged to eliminate or minimise the reduction repair percentage.
- Brainstorming sessions were conducted to analyse the possible reasons for repair. Controls were then established at every step during the welding.

## STEP 3 >> Check

As welds are critical to the safety of the entire structure, the QA/QC team had strict regulatory framework. The welding operation was monitored.

In case of any defect, the radiographic film was shown and reasons for repair were explained. To promote welding quality, an incentive scheme was introduced. The daily toolbox talk forum was utilised to address quality aspects in addition to Q&HSE issues.

## STEP 4 >> Act

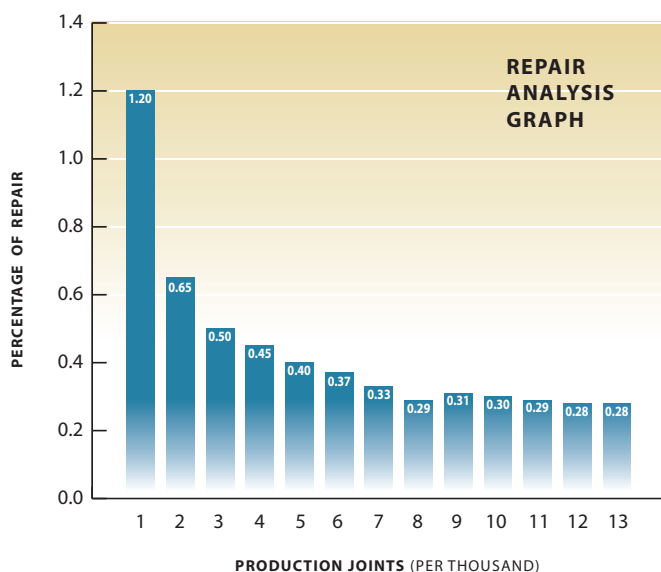
Periodical analysis of types of defects gave an insight into their reasons and elimination. Some are:

- Burn through due to high voltage
- Lack of fusion and penetration
- Slag inclusion
- Porosity

Instructions were given to keep the welding speed and voltage optimum, to avoid burn through and maintain the right electrode angle. The welding operation and was stopped if wind velocity was high. The electrode was withdrawn, the moment side burning was observed.

The results were outstanding, with a weld repair rate of 0.24%.

♦ Sanjay Prakash



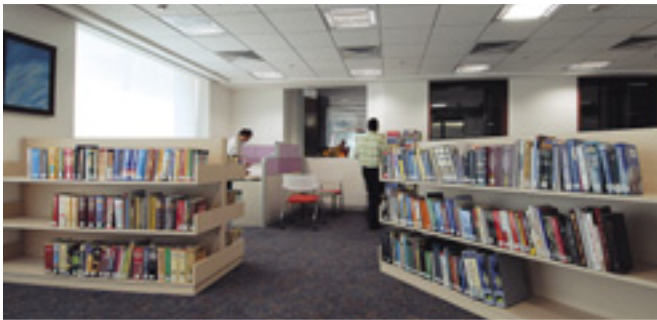




**A new beginning...**







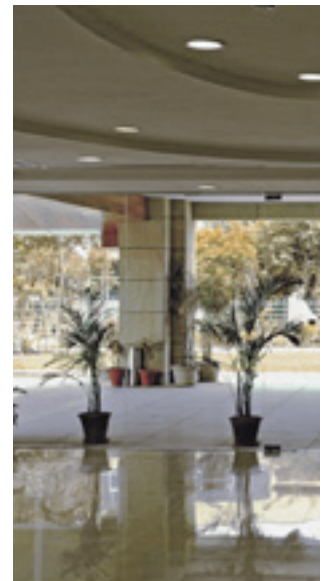
**"I envision very bright**

prospects for our growth in the future". These words reflect the optimism and enthusiasm of Chairman, Punj Lloyd - Mr Atul Punj, on the recent spurt of activities of the Company. The new corporate office being developed in Gurgaon,

is perhaps a reflection of Punj Lloyd's upbeat mood as it positions itself as a world-class organisation. Spanning an area of 17,340 sq m, the new office comprises two 3 storied buildings - Corporate Office I & II. With a three level basement, the buildings have 'an intelligent building management system' with complete office automation. The spacious cafeteria provides a welcome break

during the course of the day. Also, wanting its employees to be healthy and fit, the company has provided a well equipped gymnasium.

Corporate II is already functioning with the project offices of Pipelines, Tankage, Civil Infrastructure, Power, HVEC, Q&HSE, P&E, Insulation and Inventory having moved from their respective offices in New Delhi. On the inauguration day, a puja was performed, ushering in a feeling of harmony, goodwill and pride amongst the employees. ♦





# June 26 Founder's Day Celebration



For Punj Lloyd, 26 June is a date which is etched in the minds of all its employees. Marking the birth anniversary of the Company's founder, Pandit Kanhaya Lal Punj, it is a moment of pride for Punj Lloyd as it has come a long way in pursuing his dreams and realising his vision.

On this day, the company also recognises the valuable contribution of its employees and those completing 10, 15, 20, 25, 30 and 35 years of service in the company are awarded long service certificates and silver medallions or salvers. After the lighting of the diya to inaugurate the

function, Mr SNP Punj, Chairman Emeritus, addressed the gathering. Besides appreciating the growth of the company he also spoke about the various CSR activities of the Group especially the Dayawanti Punj Model School in Sitamarhi. The school, which started as a Hindi medium school, is now an English medium one, ensuring that the children have better employment prospects.

This was followed by the Chairman, Mr Atul Punj's speech. As always, the employees were captivated by his words. Speaking about SembCorp's acquisition, Mr Punj mentioned

that the beauty of this relationship was that SembCorp was present in almost every sphere that Punj Lloyd wasn't, hence giving Punj Lloyd a huge canvas to work upon. Mr Punj envisioned a bright future for the company and expressed his desire to see it as amongst one of the top five global EPC companies in the next five years - 'Top V in 5'. He also applauded the contribution of all the employees and attributed the success of the company largely to the joint effort put in by everyone. His speech was followed by high tea where all the employees had an opportunity to meet. ♦



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ISO 14001 : 1996 EMS  
OHSAS 18001 : 1999 OHSMS

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