

**RELIANCE - PETROFAC - SHELL** TOTAL = PGN = PETRONAS = CAIRN PBTANKERS = BG = DMRC HORIZON TERMINALS - CESC EXXONMOBIL - HPCL - CFCL GUJAPAT GAS - HYUNDAL - LTA BHARTI - PUB - QP - ADCO SAUDIARAMCO = GASCO CONOCOPHILLIPS - KARACHAGAN TENGEZCHEVROIL - SIRTE HIB - IOC - GAIL - ONGC - BPC NHAL MARPLES CPCL - HA OIL INDIA FEILS NPCIL

## OUR PRIZED REPEAT RELATIONSHIPS





Reticent and media shy, Atul Punj is rarely seen in public forums except on matters pertaining to India Inc. or on the company itself. And invariably, the audience develop an instant rapport with this gutsy, gung-ho and veracious entrepreneur. On Punj Lloyd's silver jubilee, the Update team was definite about getting Atul to speak on what this occasion meant to him. It was difficult but he finally agreed. 'No personal questions', he warned.

Here's bringing you the first ever, exclusive and candid interview with Atul Punj, Chairman Punj Lloyd Group.

Update Team: You started as a first generation entrepreneur. What is the feeling now that your group is a US \$ 2 billion enterprise?

Atul It's a mixed bag of feelings. Pride, as I charted my own path and every risk I undertook was my own, and disappointment sometimes that we could have fared better. But I guess every entrepreneur feels the same; the drive to do more is what keeps the business going. I started as a college graduate doing insulation contract in Iraq and today my company is an EPC service provider to over 24 countries, an infrastructure developer, besides being in defence manufacturing.

Update Team: Your Company's list of marquee clients has some of the biggest brands of the world. How have you made that happen?

(Laughs). I travel overseas three weeks a month. Perhaps that answers your question. I spend a lot of time meeting clients including governments, understanding their intent and needs. Universally clients look for a partner who can be trusted and I spent a lot of time in building that trust through developing a competent management team, the company's core assets by way of a huge fleet of equipment, international practices of safety, quality and environment and an unmatched culturally diverse workforce. Today clients know that we are a robust group and will put our best foot forward, no matter how challenging the terrain or project.

Atul



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Update Team: What made you acquire the Singapore company, Sembawang Engineers and Constructors.

In two decades, Punj Lloyd had established itself as a key Atul player in Oil & Gas in the Middle East, Africa, South East Asia, Caspian and India. Our infrastructure capabilities however were limited to a few highways and roads. It was at that time that I heard that SembCorp Engineers & Constructors, the construction wing of the Singapore government-owned SembCorp was up for sale. It was an excellent mix for us and complemented our portfolio, making our services more inclusive and widened our footprint to include China and Europe. There is perhaps nothing now that we cannot deliver in the infrastructure space starting from roads, highways, expressways, MRT/LRT and urban infrastructure including residential buildings, townships etc. Sembawang's pregualification allowed us to bid for airports, underground tunnels and building projects in India.

#### Update Team: People say you are very private person. Is it true?

Atul As a Promoter in Punj Lloyd, I would rather have my company and its services be a subject than me as a person! I feel I am doing injustice to my company if I cannot draw attention to the fact that a brand of the might of Punj Lloyd was created in 25 years, while other companies of comparable competencies have taken over fifty years to build such empires.

#### Update Team: What scares you?

Atul I have never suffered from a 'herd mentality' and always had an appetite for doing something different. That's how I could come out of the family's business of insulation to diversify into construction and that's how I could think of business beyond India, which at that time was rare. I could not have made it so far had I always been conservative in our business approach. It is obvious that new opportunities, be it new geographies or new businesses, will come with their share of risks. Today we are so large that it is sometimes terrifying to think of what can go wrong and in what part of the world! Update Team: Was it your risk taking appetite that made you venture into Defence?

- Atul Contrary to what you say, Defence is one of the lowest risks in Punj Lloyd's business portfolio. It is a new venture with a long gestation period. With the offset policy in India, there is a huge demand for Indian manufacturing facilities who can partner with global suppliers and I feel excited about the prospects of working for my own country's security needs. We are also excellently placed to deliver to the Indian Forces with our top-class manufacturing and systems facility in Gwalior and our established credentials.
- Update Team: This brings me to our next question. How do you manage risk?
- Atul It is not that we have always managed risk very well. We have had our share of unpleasant surprises. However, having said that, we invested in a strong risk management team. We have also reworked our business strategy to ensure that we can deal with these sudden outbursts. Thankfully we are able to hedge our risk owing to our diversified business approach and presence in diverse economies.

#### Update Team: How do you keep yourself updated ?

- Atul My staff stocks a lot of reading material for me on the aircraft. I love reading international newspapers. It's interesting, informative and gives fresh perspectives.
- Update Team: What is that one thing you still have left to do? We are not referring to routine business.
- Atul I have many things left to do, not just one! The family Foundation that focuses on education and rural health. Spending more time on the upliftment of Indian craftsmen, among many others. The one thing that I hope for is never to have only one thing to do!

Update Team: Your company has delivered innumerable projects in Oil & Gas and Infrastructure in India and abroad. Which among all these is top recall for you and why?

- Atul We have many significant projects but for me Baku-Tbilisi-Ceyhan is by far the most technologically and logistically challenging. In many ways it put us in the league of large international contractors, laying that pipeline in the Taurus and Caucasian mountains of Turkey and Georgia with over 15 specialists working with us to ensure an environmentally safe pipeline.
- Update Team: You travel so extensively meeting the Heads of States of various countries. Is there any one special person you look up to?
- Atul The most interesting interaction has been with the leadership in Singapore with Lee Kuan Yu, Senior Minister Goh Chok Tong and the PM, Lee Hsien Loong, their practicality and their vision to translate this into action is unique to Singapore.
- Update Team: If Atul Punj was not the Chairman of Punj Lloyd, what would he have been?
- Atul Would love to be involved in think tanks, in geopolitics in Energy.

#### Update Team: Any message for your clients?

Atul If we have done you proud, remain with us and if we have let you down, give us another chance. Show us how to improve and make up any shortcomings. As they say 'no body's perfect' but we will strive for perfection.

## **Repeat Orders** A rewarding tale of customer satisfaction

In every organisation aspiring to grow, the 'firsts' play an immense role in establishing business. Companies also have a strong emotional connect with their first orders or milestones, a memory of their journey from small to big, and realisation of their ambitious vision to reality.

While Punj Lloyd's history is strewn with these firsts, years of performance and delivery have also created a niche for the company's 'repeats'. Indicative of many attributes of the company, repeat clients also reflect strong bonds of trust for delivery of projects. Present in a gamut of business verticals in Oil & Gas and Infrastructure and in over 22 geographies, our repeat clients also underline our expertise in these verticals and our dominant position in the markets in which we operate. We aim to become the Company of choice for our clients in our global markets, for all our businesses, driven by an entrepreneurial spirit, cutting edge technology and excellence in execution.

As we complete 25 years of our journey, the time is right for us to introspect on the footprints we have left across the world, many due to the continuous faith reposed in us by our clients. The government-owned corporations are termed as Public Sector Undertakings (PSUs) in India.

Punj Lloyd is proud of the exhaustive volume of work it has undertaken for the Indian Public Sector Undertakings, contributing immensely to building quality infrastructure of the country.



The largest number of oil & gas projects of Punj Lloyd have been delivered for Indian Oil Corporation, India's flagship national oil company. A true reflection of our prowess in the process segment! We have executed complex hydrogen generation and hydrocracker units, delayed coker, motor spirit up-gradation and sulphur units in prominent refineries of India, other than a multitude of pipeline and crude oil tank contracts.

The recent launch of the LPG Import-Export Terminal at Ennore in Tamil Nadu for IndianOil Petronas was a moment of pride for Punj Lloyd as it was Punj Lloyd's 2nd LPG terminal. Besides, the terminal had a direct impact on the availability of domestic and industrial LPG in the southern states of India. Our work for Indian Public Sector Undertakings (PSUs) The diversity of delivery within the process segment is evident through these projects **delivered for IOC** 





HYDROCRACKER AND HYDROGEN GENERATION UNIT, HALDIA REFINERY

Indian Oil has also been a partner in our new initiatives. Sharing common philosophies, IOC was highly supportive of Punj Lloyd's holistic programme for the well being of workers. Life Enrichment, launched at three IOC refinery sites - Naphtha Cracker at Panipat, Hydrocracker Unit at Haldia and Delayed Coker LPG Merox Unit at Vadodara - had as many as 4293 beneficiaries.





## GAIL (INDIA)

Punj Lloyd's work with the largest gas transmission and marketing company of India, GAIL (India) Ltd, started with the laying of prestigious pipelines like the Jamnagar Loni and Thal-Usar-Thal projects, moving towards the EPC of large dia pipelines – Dahej Vijaipur 42" dia pipeline. These projects, varying in scale and scope, have played an invaluable role in building a strong energy chain across the country with a multitude of prestigious projects in the Maharashtra, Gujarat, Madhya Pradesh and Andhra Pradesh.

The Dahej Vijaipur 42" dia pipeline created history! A project where men and machines worked wonders and where rainfall did not deter the workforce from laying 506 km 42" dia pipeline in a short span of 270 days, of which 120 days was torrential monsoon. In a memorable moment in 2009, Punj Lloyd received the Essar Infrastructure Excellence Award in association with CNBC TV18 in the Oil & Gas category for the Dahej-Vijaipur Gas Pipeline (DVPL), which forms a part of the national gas grid.

Punj Lloyd received global appreciation for the extraordinary execution of this project. So much so that Chairman, Atul Punj, is fondly addressed as 'Mr Dahej' by some of Punj Lloyd's cherished international clients. GAIL itself, in many of its public announcements released post completion of the pipeline acknowledged the laying of the pipeline six months ahead of time resulting in cost saving worth Rs 536 crore. In the Dahej Uran pipeline, Punj Lloyd crossed 8 rivers using the Horizontal Directional Drilling technique.

Following the Dabhol Panvel pipeline, the Dabhol-Bangalore pipeline was another important project for the states of Maharashtra and Karnataka in India. Punj Lloyd executed seven spreads comprising 820 km of the pipeline. Carrying re-gasified LNG (RLNG)



I have been witness to the journey of Punj Lloyd since it was founded in 1988. Punj Lloyd has been closely associated in successful execution of various prestigious projects of GAIL which have won global acclaim for excellence in project management including, amongst others, the Dahej-Vijaipur pipeline project. Apart from executing several domestic projects, they have acquired a niche position globally in a short span of time, which is a matter of pride for any EPC company. Punj Lloyd has successfully diversified beyond Oil and Gas sector to implement large scale infrastructure projects. There are not many companies that come to mind that have the capability and grit to deliver on the exacting requirements of infrastructure industries while setting global standards in the management of these projects. On its Silver Jubilee year, my congratulations to the team at Punj Lloyd for having established a strong Indian conglomerate in the EPC sector on the global stage".

B C Tripathi Chairman & MD, GAIL

pipeline was to supply it to industrial clusters in Maharashtra and Karnataka.

from the gas terminal of Ratnagiri Gas & Power Pvt. Ltd, the

**1992** > 12" dia, 32 km pipeline from Thal to Grasim plant Maharashtra

TAT

**1994** > 12" dia, 32 km RSEB pipeline Rajasthan

1995 > 18" dia, 40 km Gandhar-Zanor pipeline Gujarat

**1997** > 36" dia, 349 km, 170 km and 165 km pipelines for a Gas Rehabilitation and Expansion project, Madhya Pradesh

**1998** > 26" and 20" dia, 20 km Thal Usar Thal pipeline Maharashtra

2000 > 16" and 12" dia, 435 km Jamnagar Loni Pipeline Gujarat

> 2002 > 18" dia x 2 HDD crossings of 1.7 km across each river, KG Basin Phase II Pipeline, Andhra Pradesh

> > 2003 > 10" dia, 176 km Vizag Secunderabad Pipeline Andhra Pradesh

2004 > 42" dia, 506 km Dahej Vijaipur Gas Pipeline Gujarat

> **2007** > 30" dia, 144 km Dahej Uran Pipeline Gujarat





2008 > 30" dia, 113 km Dabhol Panvel Pipeline Phase I Maharashtra

> 2009 > 30" dia, 50 km Dabhol Panvel Pipeline Phase II Maharashtra

> > **2010** > 36" dia, 825 km Dabhol-Bangalore Pipeline, Maharashtra and Karnataka

> > > **2011** > 48" dia, 145 km Dahej Vijaipur Pipeline Upgradation Gujarat



#### **Up the Value Chain**

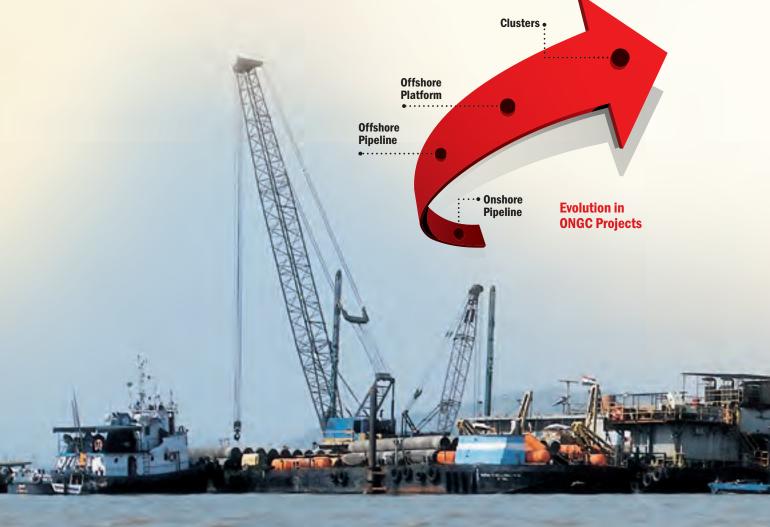
Punj Lloyd has undertaken construction activities for brownfield and greenfield onshore, near shore and offshore projects of ONGC, one of Asia's largest oil and gas exploration and production companies, producing around 72% of India's crude oil and 48% of its natural gas.

A few of Punj Lloyd's firsts came from this giant! In 1985, Punj Lloyd completed the Ankleshwar Baroda pipeline, followed by the Gujarat pipelines including Dahej Gandhar and the Gandhar Baruch. Punj Lloyd also laid the 42" dia 21 km onshore portion of South Bassein Hazira Trunkline in 1995. Relationships with clients like ONGC date back to the onset of operations of the company itself, providing repeated opportunities for honing pipeline expertise in near shore and offshore.



I am happy to learn that Punj Lloyd will be completing 25 years of its services this year. In this era of fierce business competition, while upholding quality and professionalism at a competitive price is a matter of continuous challenge, continual improvement in Punj Lloyd's growth and performance is noteworthy. Their contribution to Indian oil & gas industry in terms of providing integrated design, engineering, procurement, construction and project management services in the energy and infrastructure sectors is being increasingly recognised by the industry. On this special occasion of their Silver Anniversary, let me compliment Mr. Atul Punj and his Team and wish them all success in their future endeavours.

Sudhir Vasudeva Erstwhile CMD, ONGC



From onshore pipelines, Punj Lloyd moved into laying of offshore pipelines. The Uran Trombay Jawahardeep oil pipeline and the 20" dia, 24 km Uran Trombay gas pipeline, had to pass through land, marsh, shallow water and offshore areas.

ONGC can be credited with providing us our first opportunity in India to work on an offshore platform.



Our long association with Punj Lloyd has been a warm and enriching experience. The company's emergence as a leading name in the Indian Corporate world has been the result of a clear vision, deployment of high end technology and immaculate execution. The focus on people has enabled clients to experience a high level of professionalism finely blended with a personal touch. The company's initiatives in the area of Renewable Energy reflect its commitment to bring about long term positive change in the global community and the environment.

R K Singh Erstwhile CMD - Bharat Petroleum Punj Lloyd has executed a volume of work for Bharat Petroleum Corporation Ltd (BPCL), one of the largest public sector oil marketing companies of India and ranking 229 in the Fortune Global 500 rankings of the world's biggest corporations for year 2013.

BHARAT PETROLEUM CORPORATION LTD (BPCL)

It was in 1985 that Punj Lloyd worked on the Aviation Fuelling Complex for BPCL at IGI Airport, New Delhi. Punj Lloyd was also involved in the Oil Storage Depot at Bhilai and Rairu, near Gwalior, tankage depot at Bhilai and Brijwasan, among others. In 1999, Punj Lloyd laid the multiproduct Mumbai Manmad pipeline which required HDD across the Ulhas river, 125 km through rocky terrain. This was followed by the construction of 332 km Mumbai-Manmad Manglya pipeline. Punj Lloyd has also executed a sulphur block and storage tanks for Kochi Refinery of BPCL in 2000 and 1998 respectively.

#### NATIONAL **HIGHWAYS** AUTHORITY **OF INDIA** (NHAI)

Punj Lloyd has supported NHAI in its aggressive plans to upgrade and strengthen National Highways through various phases of National Highways Development project (NHDP), across the length and breadth of the country. The National Highways have a total length of 71,772 km, serving as the arterial network of the country. National Highways carry about 40% of the total road traffic.

Punj Lloyd has delivered projects both in the North-South and East-West Corridor (NS-EW), the largest ongoing highway project in India and the Golden Quadrilateral. The NS-EW Corridor is the second phase of the

National Highways Development Project (NHDP). In combination with India's Golden Quadrilateral, and port connectivity highways, NS-EW Corridor forms a key part of the Indian highway network connecting many of its important manufacturing, commerce and cultural centres. The NS-EW project is managed by the National Highways Authority of India under the Ministry of Road, Transport and Highways.

Punj Lloyd's contribution to the Golden Quadrilateral, was immense. Out of the annuity projects of the Golden Quadrilateral, Punj Lloyd's Belgaum - Maharashtra was completed five months ahead of its schedule. Punj Lloyd used state-of-the-art plant

TOLL BOOTH AHEAD

"First of all let me express my sincere thanks to all the Punj Lloyd team which is instrumental in constructing and maintaining the Belgaum-Kolbapur NH4 road, it's late in saying so because you have completed the work in 2004. But I do travel a lot on that road and I have always admired this patch of 77 km. I always enjoy driving through this patch of road. It is a well thought of design with toilets, truck lay-by's, bus stops, lights at every cross roads, service roads.... the list go on. Also I would say that constructing the road is easy but maintaining it at that quality does take a lot of efforts, and Punj Lloyd team has maintained it.

And I do hope that henceforth when you upgrade the road from 4 lanes to 6 lanes we will be able to see the same excellence of the earlier work with some new innovative ideas."

Mandar Patil Ram Engineers Kolhapur

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and equipment to implement this prestigious project. One of the special achievements was the complete rehabilitation of the 200 m long Ghat Prabha river bridge in a mere 90 days. It is for this project that the renowned NGO, Kumari Rajashree Parmar Memorial Foundation, working in the field of road accidents, and a member of the advisory group to NHAI, commended Punj Lloyd for its quality of construction and attention to road safety.

Today, almost 10 years later, this infrastructure continues to delight commuters.

Another vital road project bagged by the Punj Lloyd team under the Golden Quadrilateral project was the construction of a section of the NH 8, the Jaipur bypass.

Punj Lloyd is proud to have played a role in enabling infrastructure to connect the rural interiors with the rest of the country.

From its work on the upgradation of Belgaum-Maharashtra Border Section of NH-4 Karnataka, upgradation of Dharmavaram-Tuni Section of NH-5, Andhra Pradesh and the Hyderabad-Vijayawada section of NH-9 in South India, Punj Lloyd has also worked on upgradation of NH-76 in Rajasthan in the North and the Assam Highways on NH 54 & 31 on the East West corridor, among several others.



## **Road projects for NHAI**





## Punj Lloyd's NHAI Roadmap in India





Punj Lloyd has played a critical role in setting up Phase III of the Mangalore Refinery and Petrochemicals project to expand the processing capabilities to 15 MMTPA from the present capacity of 12 MMTPA. Punj Lloyd has undertaken mechanical work of Petro Fluidised Catalyst Cracking Unit (PFCC) Unit

and Offsite piping work as part of this expansion. It has also completed Coke Drum Structure Package (CDSP) on EPCC basis.

#### CHENNAI PETROLEUM CORPORATION LTD (CPCL)

Punj Lloyd is working on a repeat order from CPCL, to build the Sulphur Block of Resid Upgradation Project at its Manali refinery near Chennai. The scope of work includes residual basic and detailed engineering, procurement, construction, installation, pre-commissioning, commissioning and project management for the sulphur block comprising two 100 TPD Sulphur Recovery Units including Tail Gas Treatment Unit, 60 m<sup>3</sup>/hr Sour Water Stripper and 250 TPH capacity Amine Regeneration Unit on a single point responsibility basis. Punj Lloyd had executed a similar project for CPCL in 2003. KONEGRANES SOLOT

### HINDUSTAN AERONAUTICS LTD (HAL)

To win a repeat order from a client in an established business is not as challenging as winning a new client for a new business. As passionate as it is about cherishing old relationships, Punj Lloyd is equally passionate about creating new ones. After the establishment of the state-of-the-art Manufacturing and Systems facility in Gwalior with large bed, advanced machines, Punj Lloyd cemented its credentials as a credible player in Defence. Today Punj Lloyd has won orders for components like Upper and Lower Tank Panels for Sukhoi 30 MKI, Combustion Chamber Casing, Spars for Dornier aircraft and Housing for MGB- OTS from HAL, Nashik, Kanpur, Koraput and Bangalore.

**HAL** 

I convey my best wishes to Punj Lloyd on the eve of silver anniversary. In a short time, Punj Lloyd has made impressive strides in registering their presence in defence and aerospace sector. I am impressed with the infrastructure and capabilities established as well as vision of their leadership.

I have no doubt that Punj Lloyd would be able to provide required services to all the stakeholders of defence and aerospace sector.

HAL always welcomes good and reliable partners to join in supply chain of HAL and I am confident that Punj Lloyd would be meeting all the expectations and requirements of future.

#### Sudhir Kumar

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Erstwhile Executive Director MRO- Business Development Hindustan Aeronautics Limited

Punj Lloyd has delivered many oil & gas projects for GAIL, ONGC and IOC where EIL (Engineers India Ltd), was the engineering consultant. EIL is reputed for its engineering and technical services for the oil and gas industry. ENGINEERS INDIA LTD (EIL)



Our relationship with Oil India goes back to 1990 when Punj Lloyd executed the Gas Field Development in Western Rajasthan. Punj Lloyd recently completed drilling oil in Gabon for Oil India's Shakti Block. The third well struck oil, this discovery of black gold as it is called, a maiden discovery for Oil India on foreign shores. This was followed by a repeat order in Gabon from Oil India.

#### NUCLEAR POWER CORPORATION OF INDIA LTD (NPCIL)

Among the prominent clients in nuclear power, Nuclear Power Corporation of India tops the charts. Punj Lloyd has executed many orders for NPCIL.

Going back to 1998 when Punj Lloyd had executed Process Water Piping Packages for 2 x 220 MWe RAPP-3 & 4 nuclear power plants at Kota, Punj Lloyd has kept pace with the country's increasing need for energy to deliver the primary piping and AC & Ventilation Packages for 2 x 700 MWe Kakrapar Atomic Power Project (KAPP) Unit 3 & 4 in Gujarat and 2 x 700 MWe Rajasthan Atomic Power Project (RAPP) Unit 7 & 8 in Rajasthan. PL Engineering, Punj Lloyd's design and engineering arm is also executing various engineering packages for NPCIL.



Punj Lloyd has constructed 4.78 km of elevated viaduct and four elevated stations on Inderlok-Mundka corridor, Phase II for Delhi
Metro. Prior to this, Punj Lloyd had also constructed the viaduct from Kirti
Nagar to Tilak Nagar section for Line 3 of Delhi Metro.

Other than its phenomenal work executed for Government PSUs, Punj Lloyd has also delivered significant projects for the many Oil & Gas and Infrastructure majors of the country

#### **RELIANCE**

Punj Lloyd's expertise in cryogenic tanks is well established. Among its noteworthy projects in this domain are the cryogenic LPG storage and reliquification tanks constructed for Reliance at its Jamnagar Refinery. Punj Lloyd has also laid pipelines and water systems for the company other than storage facilities.

East West Gas Pipeline in the Western Ghats of the country, had Punj Lloyd lay pipes in extremely steep slopes of the Bhivpuri Ghat, employing advanced construction methodologies like a cable crane system for



transporting pipes and equipment down slopes, as conventional methods were not possible. Being an environmentally sensitive zone, construction work required focus on safety and environment best practices. Punj Lloyd also crossed 1.5 km by HDD, the longest river crossing of 48" dia done in India.

#### BG EXPLORATION AND PRODUCTION INDIA LTD

Punj Lloyd undertook the civil, mechanical and structural work for BG Exploration and Production India Ltd at the ONGC plant at Hazira. Punj Lloyd also undertook the engineering, procurement, fabrication, load-out, sea fastening, classification and commissioning of Panna CALM buoy system.

#### CAIRN INDIA

Punj Lloyd has laid both crude oil insulated and gas pipelines of varying diameter for Cairn India. Punj Lloyd has completed construction of the insulated crude oil tanks for Cairn India Ltd at Bhogat, near Jamnagar on the Arabian Sea coast. The tanks form an integral part of a large crude oil



P Elango, Chief Executive Officer (erstwhile) of Cairn India Limited wrote in an email communication,

"I am delighted to learn that Punj Lloyd will be completing 25 successful years in business. I congratulate the entire Punj Lloyd team for reaching this enviable milestone. Over the years, Punj Lloyd has established itself as a leading player and partner of choice in EPC services across energy and infrastructure sector emerging as a global player. I wish the team all the very best and every success to reach the Golden Anniversary!"

terminal playing a critical role in the energy chain, starting from the Mangala field, the largest of the five commercial discoveries within the Rajasthan License Block RJ-ON-90/1, being developed by Cairn India.

#### CALCUTTA ELECTRIC SUPPLY CORPORATION

CESC, a part of RP Sanjiv Goenka Group, remains one of Punj Lloyd's esteemed clients in the Power sector, with two projects being delivered for the Group, one in Maharashtra and the other in West Bengal. Both of 2 x 300 MW capacity where Punj Lloyd executed the design, engineering, procurement of equipment, erection, testing and commissioning of balance of plant packages (BOP), complete civil work on EPC basis. In the coal based thermal power plant in Haldia, ETC of main plant equipment including boiler, turbine, generator and its auxiliaries was also within its scope.

CESC

On the happy occasion of Punj Lloyd's 25th Anniversary, I send my warmest greetings to all its people under the dynamic leadership of Mr. Atul Punj. In the engineering industry, 25 years is not a long period and it is commendable that Punj Lloyd has achieved such a leadership position within a remarkable short span of time. May it grow from strength to strength and further brighten the image of Indian technology and entrepreneurship.

As EPC contractors for balance of plants, Punj Lloyd has been closely associated with us at two of our thermal power plants under construction at Chandrapur (600 MW) and Haldia (600 MW). Needless saying, the timely completion of these two key projects is depending heavily on the performance of our EPC contractors. At CESC, we will be looking forward to a long and

mutually beneficial association with Punj Lloyd.

Sanjìv Goenka Chairman, RP-Sanjiv Goenka Group

#### HINDUSTAN PETROLEUM CORPORATION LTD (HPCL)

For HPCL, a Government of India Enterprise with a Navratna Status, and a Fortune 500 and Forbes 2000 company, Punj Lloyd laid its first cross country pipeline - Mumbai Pune Product pipeline in 1985 and the Pune

Solapur pipeline through the Western Ghats. It was a baptism of fire that set the stage for bigger milestones to be achieved in subsequent years. Punj Lloyd also worked on the process units comprising crude, vacuum distillation units, visbreaking unit for 3 MMTPA capacity expansion at Vizag.

#### GUJARAT GAS CO LTD

Gujarat Gas Company Ltd is the largest private sector natural gas distribution company. Established in 1980, the company operates primarily in Gujarat. Punj Lloyd laid pipeline for the Surat Gas Distribution Grid in 1991, followed by sections of the Hazira Ankleshwar pipeline, Amboli Jhagadia gas pipeline and the Mora Sachin Palsana pipeline.

#### CHAMBAL FERTILISERS AND CHEMICALS LTD

Punj Lloyd has delivered the DM water plant and storage tanks and the RAW water Intake System for the Gadepan plant for Chambal Fertilisers and Chemicals Ltd, one of the largest private sector fertilizer producers in India.



#### HYUNDAI HEAVY INDUSTRIES

Ravva Oil and Gas Field Development Oil & Gas fields of S. Yanam, Andhra Pradesh South Bassein Hazira Trunkline.

#### BHARTI GROUP

A little removed from Punj Lloyd's delivery of energy and infrastructure projects, was the bouquet of services Punj Lloyd offered in the field of telecom. Punj Lloyd has delivered over 13 projects for the Bharti Group including project management consultancy and OFC laying.

## bhartí

Speaking on the company's silver anniversary,
Sunil Mittal, Chairman - Bharti Enterprises Ltd, said:
"A Silver Jubilee is a momentous milestone in the history of any company.
Over the last 25 years, Punj Lloyd has mirrored India's growth story building a world-class company with a footprint across the far corners of the globe. It truly embodies the spirit of entrepreneurship, courage and conviction that Atul symbolizes. He has created a huge brand for the Indian infrastructure industry on the global stage."

#### **PETROFAC**

Punj Lloyd has executed several projects for Indian oil corporations through Petrofac, an international provider of integrated services to the oil, gas and energy production and processing industries.

#### **International Repeat Clients**

Client	Refinery	Unit
Chennai Petroleum Corp	Manali Refinery	Visbreaker and Sulphur Block
Bharat Petroleum	Kochi Refinery	Sulphur Block
Indian Oil Corp	Mathura Refinery	Sulphur Block
Indian Oil Corp	Koyali Refinery	Sulphur Block

Punj Lloyd is proud of its marquee clients worldwide. Reputed international conglomerates have chosen to work repeatedly with the Company. International Repeat Clients

#### **Asia Pacific**

#### TOTAL INDONESIE

The fifth largest publicly-traded integrated international oil and gas company and a world-class chemicals manufacturer, TOTAL operates in more than 130 countries. Punj Lloyd is proud to have delivered challenging repeat projects for this global energy giant.

Starting with the five projects of Field Development in Tunu, a gas and condensate field on the outer margin of the Mahakam delta, Punj Lloyd went on to lay gas pipelines in the treacherous Tambora fields, also in Mahakam delta for TOTAL. Marshy swamps of the Mahakam Delta were witness to Punj Lloyd's deployment of a huge fleet of amphibious equipment to execute challenging projects, one after the other. Tunu Development Phase 9 enabled TOTAL to meet its production requirements by constructing trunklines to connect new Gathering Testing Satellite Stations to the existing pipeline network. The offshore pipelaying operation was executed in currents exceeding 8.5 knots. The Mahakam delta is infamous for its shallow sea with excessive currents. The inner delta criss-crossed by rivers, was inhabited by salt-water crocodiles, snakes and other reptiles. TOTAL rated Punj Lloyd 86% under the Very High Risk Category for the Tunu Phase 9 project.

Another successful project for TotalFinaElf E & P Indonesie was the Peciko Onshore Development Phase 4, another gas and condensate field, 25 km from TOTAL's Senipah terminal. To meet the needs of the Tunu and Peciko projects, Sungaipuran base camp was established in Indonesia. Accessible both by river and road, the base camp sprawled over an area of 45,000 m<sup>2</sup>.

Installation of a gigantic platform for TOTAL called the South Utility Platform for the Tunu 11 project was not free of challenges as it was the first time a 1000 T platform built on a skidway was loaded out onto a barge, transported and installed midstream by float over method.

#### PT PERUSAHAAN GAS NEGARA (PGN)

PT Perusahaan Gas Negara, a world-class energy company in gas utilisation, was one of our key customers in Indonesia for which we delivered Phase I and II of the South Sumatra to West Java Gas Pipeline, passing through rubber, palm, pineapple, sugar cane and paddy fields and 7 km of swampy land. Eleven crossings were executed by HDD method with a total drilled length of 7,000 m. Another significant project executed for PT Perusahaan Gas Negara was the Panaran Pemping Gas pipeline in Indonesia. Also know as the Hopping Island project, the pipeline which was completed in 12 months was one of the links of the Grissik - Sakaran - Batam - Singapore pipeline, transporting natural gas from South Sumatra to Singapore.

#### CONOCOPHILLIPS

Punj Lloyd has worked in both Indonesia and Singapore for ConocoPhillips, the largest integrated energy company in the U.S. and the fifth largest refiner in the world. The Sumpal Expansion Project for ConocoPhillips in Sumatra entailed installing additional facilities at the Sumpal Gas Plant near Jambi. In Singapore, Punj Lloyd executed the receiving facility and its modification on EPC basis, in a live refinery area in brownfield conditions.

#### PETRONAS

Punj Lloyd constructed 16" dia 128 km multi-product pipeline from Melaka Refinery along the west coast of the Malaysian Peninsula to Kuala Lumpur International Airport and a new distribution terminal at Klang valley for Petronas and Shell Malaysia. Punj Lloyd is currently laying the 521 km, 36" dia Sabah Sarawak onshore gas pipeline in Malaysia in extremely harsh terrain comprising rocky, mountainous slopes with an altitude of up to 3,366 feet. The pipeline construction involved as many as 3,000 crossings including 24 HDD crossings.

#### SHELL

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Extremely proud of our association with Shell, Punj Lloyd has worked on several projects for the company including the new fuel oil terminal at the Pulau Laut, Kalimantan, Indonesia. Punj Lloyd has been involved in the Hazira LNG re-gasification terminal in India where storage tanks of 80 m dia and 40 m height were constructed. Roof weighing 770T was lifted with air pressure of 146 mm of water column to a height of 34 m in 2 hour 40 mins.

The second roof was airlifted in a record time of 1 hour 38 minutes. This was the fastest air lift of a dome roof of such proportions in India. Punj Lloyd is also involved in the construction of a Lube Oil Blending Plant (LOBP) and Grease Manufacturing Plant (GMP) for Shell at the Tuas Lube Park in Singapore.

MARA HA INTO MANUAL

#### PB TANKERS

PB Tankers is another of our valued repeat clients for whom we have built the topside facilities and the petroleum storage expansion phase II at Pulau Busing.

#### EXXONMOBIL ASIA PACIFIC PTE LTD

Punj Lloyd has delivered projects for ExxonMobil including the SAR revamp and the main mechanical PAC and PESEK at Singapore.



I have seen Punj Lloyd teams on the field in a rather difficult project environment. Even if not perfect, those teams have demonstrated a high level of integrity and dedication, particularly for safety, resulting in a very good safety performance.

Georges Grosliere Singapore Chemical Plant Singapore Parallel Train ExxonMobil Asia Pacific Pte Ltd

#### HORIZON TERMINAL PTE LTD

With its Asia Pacific headquarters in Singapore, Punj Lloyd has done extensive work in the country. It has built as many as 57 storage tanks as part of the Bulk Liquid Product Terminal for Horizon Terminals Pte Ltd, a milestone in the development of Banyan Jurong Island as a key global terminal hub.

For Horizon in Dubai, Punj Lloyd delivered the Falcon Jetfuel Pipeline & Bulk Terminal Facilities.



#### LAND TRANSPORT AUTHORITY OF SINGAPORE

Enjoying the trust of Land Transport Authority, responsible for the development of infrastructure in Singapore, Sembawang Engineers and Constructors has repeatedly been associated with creating mega iconic

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structures in Singapore. Stations for the Downtown Line 1 & 2 and the Circle Line projects in Singapore will greatly enhance the connectivity. Earlier projects with LTA included the Changi Airport MRT station, the Boon Keng and Newton MRT stations and the Ponggol and Sengkang LRT systems.

#### PUBLIC UTILITIES BOARD

Sembawang's work with the PUB for the Changi Water Reclamation project, part of the Singapore Deep Tunnel Sewerage System project comprising a series of construction and equipment procurement packages in stages, was extremely challenging. In recent years, Sembawang won the Lower Seletar Waterworks from PUB. Its work on the Ulu Pandan Sewage Treatment comprised the construction of the Digester Complex including four sludge & gas storage tanks, and eight egg-shaped digesters. Sembawang was also contracted to construct the Kranji Sewage Treatment facility and was involved in its Deep Tunnel Sewerage System. Another repeat order was the Deep Tunnel Sewerage System of Paya Lebar Tunnel. Bayfront 💂

## Middle East, Caspian and Africa

#### QATAR PETROLEUM

Some of the largest projects of Punj Lloyd have been delivered for Qatar Petroleum, a state owned petroleum company operating in Qatar, including exploration, production, refining, transport, and storage. Punj Lloyd has delivered three large pipelines - Strategic Gas Transmission, Multi Product and Doha Urban Relocation pipeline. The Strategic Gas Transmission pipeline, comprising two 36" dia pipelines, was an important development in Qatar, owing to it supporting the downstream and upstream industries. A total of 15 nationalities were working on this project, bringing their multicultural experience into play.

#### SAUDI ARAMCO

Punj Lloyd has laid offsite pipelines for Yanbu Export Refinery project for Saudi Aramco, a Saudi Arabian national oil and natural gas company based in Dhahran, Saudi Arabia. Presently the company has completed Package 9 of the Jubail Export Refinery Contract, awarded to it in 2009 by Saudi Aramco Total Refining and Petrochemical Company (SATORP), a joint venture established by Saudi Aramco and TOTAL. Jubail Export Refinery in Saudi Arabia is one of the largest and most complex refineries in the world.



#### ABU DHABI GAS INDUSTRIES LTD (GASCO)

For Abu Dhabi Gas Industries Ltd (GASCO), Punj Lloyd has constructed pipelines and storage tanks for two major projects - Asab Gas Development Phase II and Onshore Gas Development Phase III. Continuing our presence in GASCO's major projects, we installed piping, structures and mechanical equipment for Integrated Gas Development Phase V. We also undertook an EPC project of Nitrogen Gas Injection (Mixed Case) for Habshan Fields.

#### ABU DHABI CO FOR ONSHORE OIL OPERATIONS (ADCO)

The Abu Dhabi Company for Onshore Oil Operations (ADCO) operates onshore and in shallow coastal water of the Emirates of Abu Dhabi. Punj Lloyd constructed flowlines and well heads for ADCO oilfields in Bab/Bu Hasa and pipeline in Huwailah. Continuing partnership with ADCO, a major EPC well heads (158 nos.) and flowlines (750 kms) is under construction for Asab, Shah and Sahil fields. An EPC project of Spiking Gas Compressor station is under construction.

#### KARACHAGANAK PETROLEUM OPERATING BV

Punj Lloyd has also delivered many projects in the Caspian region including Karachaganak Uralsk Gas Pipeline and Stabilising & Sweetening Train, Aksai for Karachaganak Petroleum Operating BV.

#### **TENGIZCHEVROIL**

Tengizchevroil is another of Punj Lloyd's prestigious clients for which Punj Lloyd delivered two projects - the large and small bore pipelines for TCO Asset Development and The Second Generation Project Offsites and Utilities at Tengiz, Kazakhstan.



#### SIRTE OIL COMPANY

In the midstream segment, Punj Lloyd won its then largest ever EPC contract, an outstanding achievement for a new market. The project included two contracts with the State owned Sirte Oil Company for EPC of El Khoms-Tripoli Gas Pipeline Project with compression facilities at Sidra and Wachkah and Tripoli-Melita Gas Pipeline project with compression facility at Melita on a turnkey basis. Both the projects cater to the energy demand of various industrial facilities like power, cement, desalination plants and other utility service providers.

Building a special camaraderie with the local community, Punj Lloyd recruited and trained over 600 Libyans at its construction sites and in different institutes affiliated with the Labour Department.

#### HOUSING & INFRASTRUCTURE BOARD (HIB), TRIPOLI

Encouraged by its successful foray in the oil and gas sector, Punj Lloyd bid and won five projects by the Housing & Infrastructure Board (HIB) of Tripoli for the infrastructure network creation of the country's major townships including Arada, Souk Al Juma, Zawara, Ragdaleen, and Al Jamail. Punj Lloyd has very recently added infrastructure work for the city of Zliten to its body of work with HIB.

The projects comprise engineering, procurement, construction and commissioning of utilities including water, sewage, storm water main and branch lines, roads and facilities.

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# A Panoramic View of Punj Lloyd in Infrastructure

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Primarily an EPC player in the Energy segment, Punj Lloyd's initial foray into infrastructure commenced with the Vadodara Halol Tollway. Besides being its first toll project, Vadodara Halol was significant in establishing Punj Lloyd as a serious contender in civil construction. Relentless in this pursuit, Punj Lloyd diversified to win and complete water treatment plants, metro and highway projects.

Punj Lloyd's first highway project with National Highways Authority of India was the upgradation of the Nasirabad-Gulabpura section of NH 79 in Rajasthan. This was followed by a series of projects in Andhra Pradesh, some acclaimed for the ease and access they provided to the local populace. The upgradation of the Dharmavaram-Tuni section and the Rajahmundry-Dharmavaram section of NH 5, and the Belgaum Maharashtra section upgradation on NH 4, were iconic for the company as the community took note of the quality, safety and commitment displayed by Punj Lloyd in creating state-of-the-art infrastructure in South India.

Soon after, Punj Lloyd expanded pan India with projects in the north for RIDCOR and the Assam Highway projects on NH 31 and NH 54 for NHAI in the East. In 2006, Punj Lloyd made a strategic move to expand its global footprint and its construction capability in the urban infrastructure space. Acquisition of the construction arm of Singapore based SembCorp, called Sembawang Engineers and Constructors thereafter, prequalified Punj Lloyd for buildings, airports, townships, among others.

Punj Lloyd constructed Medicity - The Medanta, a multispecialty institute in Gurgaon with 1250 beds, over 350 critical care beds and 45 operation theatres catering to over 20 specialties. Punj Lloyd also bid and won a series of infrastructure township projects for the Housing and Buildings Development (HIB) of Libya.

The Group's gamut of business and its hunger for new markets has since intensified with the Group entering Hong Kong with Diamond Hill MRT project and a highway project in Kenya.

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Singapore is best representative of the expanse of urban infrastructure work

delivered by Punj Lloyd Group. Sembawang has matched the rapid development of the nation, keeping pace with the increasing need for new entertainment hubs and transportation. Sembawang constructed Southeast Asia's longest urban underground expressway, Kallang Paya Lebar Expressway (KPE). Stations on the Circle Line and the Downtown line, the fourth and fifth Mass Rapid Transit lines in Singapore, will enable the client, Land Transport Authority of Singapore to commission the line by 2017,



boosting connectivity for commuters living in the eastern and western parts of Singapore, besides easing their travel into the city and helping to ease the crowded stretches of existing rail lines.

Giving a massive boost to the country's tourism was the iconic entertainment centre by Resorts World Sentosa wherein Sembawang was the contractor for the Equarius Hotel, ESPA, beach villas, the oceanarium and a water theme park. Sembawang was also contracted by Marina Bay Sands, an integrated resort in the heart of Singapore's Central Business District, for the North Podium comprising the casino, theatres and retail

arcade. Sembawang is also building the new prison headquarters of the Changi Prison Complex for Singapore Prison Service. Contract for residential high-rise McNair Towers, a public-housing development was undertaken for the Housing and Development Board of Singapore (HDB).

Delighting visitors from across the world is the striking Changi airport of Singapore where again, Sembawang undertook the Terminal extension work comprising construction of two 500 m long 2-storey 'finger' buildings and renovation of the existing building in-between. From airport facilities such as terminal extension, runways, hangars and control towers, to airport supporting facilities such as training centres, freight and cargo terminals, inflight catering centres/flight kitchen, to MRT system transporting passengers to and fro airport, Sembawang has done it all. Singapore's first 6-star hotel - Four Seasons, was also constructed by Sembawang.



Power is one of the most critical components of infrastructure affecting economic growth and supporting industry. To this effect, Punj Lloyd Group has been involved in power projects in Indonesia, India, Malaysia and Vietnam.

In India, Punj Lloyd is executing balance of plant of large megawatt power projects across India - the 2 x 270 MW Goindwal Sahib Power plant in Punjab, the 2 x 300 MW thermal power plant at Chandrapur, Maharashtra and the 2 x 300 MW power project for CESC in Haldia, are some of the ongoing/recent projects of the Group. Also infrastructure work is in progress at the 2 x 700 MWe Atomic Power Projects Unit 3 & 4 and Unit 7 & 8 at Kakrapar and Rajasthan, respectively. The Group is also providing engineering consultancy services for Department of Atomic Energy (DAE) and for Kudankulam Nuclear Power Project in India.

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Armed with the prequalification for airports, Punj Lloyd won the contract for a greenfield airport project in Sikkim where it constructed one of the highest reinforced walls in the world. At the foothills of Himalayas, the Sikkim airport is a spectacular site built at an altitude of 4,700 ft with deep valleys at both ends of the runway. Punj Lloyd also cemented its MRT experience, having built a viaduct and station for Delhi Metro, with a contract for eight stations of the 'Namma Metro' across three reaches for the Bangalore Metro Rail Corporation (BMRC).

The Group's dexterity in infrastructure reached a new zenith with the incorporation of a special development arm, 'Punj Lloyd Infrastructure'. Identifying robust development opportunities, Punj Lloyd Infrastructure undertook development projects in roads, buildings and renewables, building both a strong portfolio and a robust order backlog for itself.

The key to the Group's successful gamut of infrastructure projects is its bevy of equipment, enabling instant mobilisation to far flung corners of the globe. Catering to every segment need and diverse geographies, the categories of equipment owned by Punj Lloyd are diverse. Dozers, Excavators, Rockbreakers, Motor Graders, Loaders, and Rock Splitters are deployed as earthmoving equipment, as in the case of Sikkim Greenfield Airport in India, where this equipment was mobilised to the mountain top in spite of difficult topography. Using this specialised equipment, the mountain had to be levelled for the runaway construction.





On the other hand, the Hot Mix/ Wet Mix plants, Pavers, Vibratory Soil Compactors, Tandem/ Pneumatic Tyre Rollers, Kerb Casting/Cutting machines, among others are deployed at the various highway projects of the Group. This repository plays a crucial role in the seamless execution of a task.

Maintenance and equipment repair yards in each of the regions where the Group operates – South Asia, Asia Pacific, Middle East and Africa, further facilitated the mobilisation and management of equipment. Tracking this equipment usage and maintaining inventories is the task of an exclusive team of trained Plant and Equipment personnel.

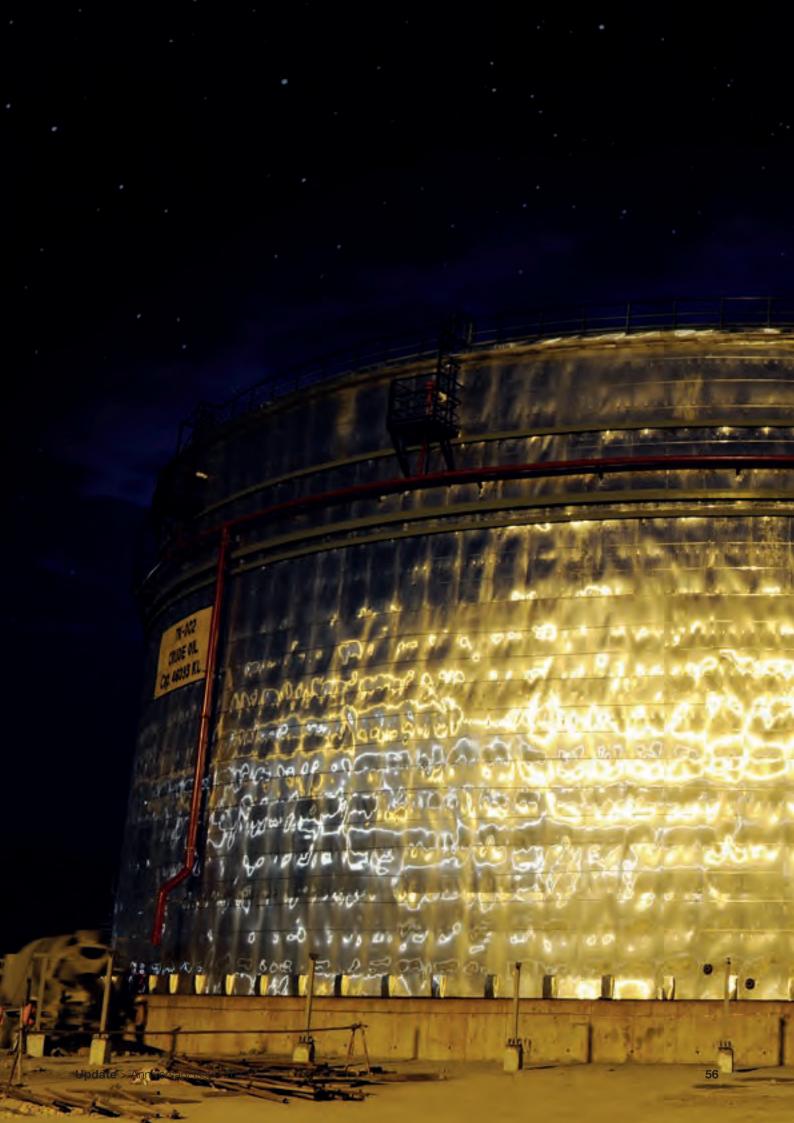
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# The Bhogat Storage and Pumping Terminal, Gujarat



Rajesh Sharma Project Manager Punj Lloyd Ltd

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# Shimmering against the dark sky

Jamnagar on the west coast of India is a quiet city of Gujarat, famous for the Jamnagar refinery built by Reliance. At night, the lights of the refinery glimmer in the pervading darkness. As one approaches Bhogat, giant constructions dominate the landscape, the light falling on shimmering metal to create a million patterns against the dark sky. These are the insulated crude oil tanks being constructed by EPC giant, Punj Lloyd for Cairn India Ltd.

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#### INTEGRAL - THE ENERGY CHAIN

The eleven storage tanks constructed by Punj Lloyd at Bhogat form an integral part of a large crude oil terminal which will play a critical role in the energy chain, starting from the Mangala field, the largest of the five commercial discoveries within the Rajasthan License Block RJ-ON-90/1, being developed by Cairn India.

#### A LONG JOURNEY TO THE REFINERY

Located 35 km north east of Barmer in Rajasthan, there is a central processing facility (CPF) at Mangala where the crude oil is stabilised, heated and pumped into a 670 km long Barmer to Bhogat pipeline, the longest continuously heated pipeline in the world and the first such pipeline in India. The Bhogat terminal will operate both as an export terminal to ship tankers and a buffer storage facility of Mangala crude oil.

It is interesting to trace the origin of oil and the journey it undertakes, finally reaching its destination to yield profit.

#### THE WAXY CRUDE

What sets the Mangala crude oil apart from other oils is the extremely waxy nature of the oil. With a pour point of 40° C, the crude oil has a wax appearance temperature (WAT) of 65° C and is expected to gel at temperature below 50° C. Its highly paraffinic nature makes it an excellent secondary processing feedstock for refineries.

The design of the tanks and associated structure therefore calls for maintenance of crude oil at a constant temperature above 65° C. The insulation hence becomes extremely critical. If the temperature of crude drops such that wax forms in the pipeline or terminal pipe work, the heat traversing system should be capable of raising temperatures to a minimum of 75° C which is predicted to be more than the dissolution (melting point) temperature of the wax.

#### **A GRAND SIGHT**

While today the terminal stands tall in its surroundings, the project team remembers coming to a stretch of land 'which had nothing on it'. Says the Project Manager, "It was a challenge to start from scratch. The other contractors came in much later to discover that difficult groundwork had already been done. We took ownership of the job right from day one like we



for any task". Among the eight huge tanks to be built, seven were coil heated and insulated, mea suring 60 m dia and 20 m height with cone roofs and a capacity of 289,331 barrels (46,000 m<sup>3</sup>). The eighth tank, though with the same dimensions, was a floating roof bulk light oil storage tank, with a capacity of 289,331 barrels. Three floating roof light oil storage tanks measuring 35 m dia x 16 m height, with a capacity of approximately 78,377 barrels (12,461 m<sup>3</sup>) were also constructed.

Tanks and Terminals have long been a core competence of Punj Lloyd. While all the LNG terminals in India – Dahej, Hazira and Dabhol, saw Punj Lloyd's involvement, the company has also built many



bulk liquid storage facilities in Singapore, besides LPG tank farms at Jamnagar. Punj Lloyd was among the first contractors to employ the jacking technology at the bulk liquid terminal in Singapore, the same technology being used for the construction of tanks at the Bhogat terminal.

These massive structures require stringent safety standards to prevent any untoward incident from happening. As many as 67 jacks of 25 T were deployed in each tank for jacking.

### Construction

At a given time five tanks were on jacks with the process becoming increasingly critical during lowering operations, as the height kept increasing. The challenge was to ensure coordination within different teams working together and prevent hot work hazards.

Large air movers were deployed at nozzles once the annular plate welding was started, allowing for work within confined space.

The seven crude oil tanks were distinctive due to the set up of LP steam SS heating coils inside the tank and side entry mixers specially designed for handling waxy crude. The traditional tank conical roof structure had additions for insulation work and special wide nozzle safety relief that posed access hazards during erection. Hydro-pneumatic tests were successfully completed for all conical roof tanks with great precision at a pressure of 600 mm of water column.

The seven giant crude oil tanks required painting which had to be done both outside and inside of shell, roof and bottom in confined space. This was followed by insulation for maintaining heat efficiency and safeguarding against corrosion. All this required a safe and standard scaffold both inside and outside of the tank. Punj Lloyd accomplished the scaffold structure in three tanks at one time with great team work. The team overcame constraints where coordination with other agencies handling piping and RCC jobs was critical for a strong scaffold base, timely material shifting crucial to allow each of the teams to work in tandem. During peak work the movement of scaffolding, insulation and painting material was on a mammoth scale requiring utmost safety and team co-ordination.

It was again a challenge to deliver one large and three small single deck floating roof tanks with flexible roof drain facility, that were used for storing light flushing oil. Meticulous planning went in timing the puncture and floatation test with the criteria of 10" of rainfall. The test was successfully conducted in a single day.

As Punj Lloyd was the primary contractor for the storage tanks, it was mandated to provide regular reports to fulfill D'Appolonia evaluation These activities These activities required the site office to schedule the procurement and inventory of critical items well. Huge quantities of welding electrodes, grinding wheels, plates, pipes, paint, rockwool, corrugated and plain cladding sheets of varying size and material were procured and managed by Punj Lloyd safely. The back office team supported its front runners to achieve the milestone of 5 Million Safe Man-Hours without LTI in the month of April 2013. The safety target was appreciated by Cairn India Limited.

#### A TOUGH TASKMASTER

While Punj Lloyd has worked with several Indian and international energy and infrastructure giants, this project with Cairn Energy India will be remembered for its best practices throughout the entire project cycle. While Punj Lloyd follows international standards of stringent health, safety and environment of its own, Cairn's exacting requirements had the Punj Lloyd project team on continuous vigil to deliver better and improved processes. Cairn's environmental, health, safety and social commitments were enlisted under a Corporate Responsibility Management System.

In addition, the company required all of its subcontractors, as partof their contractual obligations, to develop their respective EHS and social plans in line with Cairn's commitments and standards. Cairn performed independent monitoring against IFC standards in its constant effort to improve the project performance. D'Appolonia



The design of the tanks and associated structure therefore calls for maintenance of crude oil at a constant temperature above 65° C. The insulation hence becomes extremely critical of Italy was contracted as the External Compliance Monitoring Group – ECMG. This ensured a high standard of project execution at site. D'Appolonia assessed the complete Salaya - Bhogat Crude Oil Pipeline Extension Project. As Punj Lloyd was the primary contractor for the storage tanks, it was mandated to provide regular reports to fulfill D'Appolonia evaluation criteria.

#### **Reporting best practices**

Punj Lloyd provided an incident investigation report in tabular form containing data on near miss cases and first aid cases recorded in the field. EHS structures through detailed EHS organisation charts were also presented. The opportunity to conduct HSE awareness and presentations was

seized upon by Punj Lloyd in weekly HSE joint forums attended by Cairn, Punj Lloyd and other agencies working at the Bhogat terminal. The company also provided updated information on emergency mock drills conducted at site. As mandated by Punj Lloyd's vigilance team, use of Personal Protective Equipment (PPE) was extensive. Scaffolding training was provided. Equipment inspection was routinely conducted before deployment it into the field. A specific traffic management plan was prepared by Punj Lloyd. This focus on road safety and training resulted in improvement in drivers' adherence to set speed limits and safe behavior.

#### Environment

Monitoring by an approved external party was scheduled for noise, waste water and drinking water, among others for HSE compliance.

#### Air

Air quality parameters were checked during construction. In order to mitigate fugitive dust, watering of the working areas, minimisation of vehicle trips, and storing dusty material in sealed containers was done. To control particulate emissions, water was sprinkled on unpaved roads. During activities where dust was a potential hazard, nose masks were provided. Gaseous emissions were mitigated through proper operation and maintenance of all equipment.

#### Water

At Bhogat Terminal, water was drawn from open dug wells. Consumption records were kept available for scrutiny. Abandoned dug wells inside the Bhogat Terminal were used for groundwater recharge during operation activities through rainwater harvesting inside the terminal area. As many as 23 dug wells were used for industrial water and hydrotesting water, while domestic water was supplied by local vendors and delivered on site by trucks. Reverse Osmosis (RO) plants were installed to purify the water used for drinking and cooking purposes. For operations like hydro-testing, Punj Lloyd ensured that all IFC parameters for water

"It was a challenge to start from scratch. The other contractors came in much later to discover that difficult groundwork had already been done. We took ownership of the job right from day 1 like we do for any task". *Project Manager* 

disposal post hydro-testing were met. Hydro-testing procedures and requirements were captured within an official plan detailing water intake, testing, decanting and discharge commitments, procedures and associated standard operating procedures. To ensure optimum utilisation of resources the same water used for testing one tank was used for testing all remaining tanks, pipes, and pipelines.

Waste water was treated at two Sewage Water Treatment Plants (STP), one at the Punj Lloyd labour camp and the other at the site office. The treated effluent was also tested on a monthly basis. Waste water was not discharged in water bodies but used for dust abatement activities.

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#### Waste

A central accumulation area for nonhazardous waste was constructed and waste removed on a daily basis. Waste facilities were built in cement and covered, where waste was properly segregated.

As a policy mandated by the client, the practice of sending non-recyclable waste to the Khambaliya or Bhatia municipal waste sites or to other landfills not compliant with IFC standards, was discontinued. Food/organic

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waste was transported to two municipal composting facilities while hazardous waste was treated at approved hazardous waste recycler and disposal facilities. An authorised and audited waste collector was used to dispose the biomedical waste generated from Punj Lloyd's medical facilities.

Following the ECMG recommendation, cement bags were used only for small civil work and properly stored at batching plants. The main source of cement was the bulk cement loaded on-site silos. Punj Lloyd also provided a document covering reinstatement procedures.

# **People welfare**

Punj Lloyd established one of the best labour colonies on the project, housing 400 people during peak project time with the facility having a maximum capacity of 432 people. The colony was constructed following IFC workers' accommodation guidelines and was detectors were installed inside the living quarters at the labour camp.

As Punj Lloyd was the pioneer in implementing a special programme - Life Enrichment for its workers, with special focus on HIV/AIDS, at its various project sites, extending its knowledge and learning to the Bhogat site came naturally to the Company. ECMG commended this HIV/ AIDS sensitisation programme of workers.

A grievance committee was also established at the workers' camp, which included the participation of workers, camp management and camp doctors. Records of the committee's meetings were regularly kept and grievances reported and followed up. A spacious mess for workers was provided and food was hygienically prepared by a team of trained cooks. Provision of medical care for workers is a must in a construction set up. Manned by one paramedic and one visiting Doctor from Bhatia, Punj Lloyd's medical facilities were compliant with international standards. Also the facility under supervision of Cairn India's doctor was stocked with sufficient medical supplies. Medical equipment was regularly checked. A log register was maintained at the facility.

A dedicated ambulance was present at the labour camp. The paramedic staff checked first aid kits on a weekly basis. Emergency contact numbers were posted in English and also in the local language.

Punj Lloyd and its Bhogat team swell with pride for having completed this critical project safely and for having contributed substantially in the development of Gujarat, where hopes are high among the community for a progressive and sustainable future. • Punj Lloyd and its Bhogat team swell with pride for having contributed substantially in the development of Gujarat



# The beginning of a long affair...

Unending stretches of vast barren land, sun burnt bushes, scanty trees and hoards of camels passing every few minutes. The first impression of 'Bap' is that of any other village in the huge Thar Desert of India.

Things changed suddenly and Bap became a hub of activity with the Central Government's plans to tap the potential of this sun rich territory by developing solar power plants.

Jawaharlal Nehru National Solar Mission was launched by the Government of India in January 2010 with an aim to generate 20,000 MW of power by 2022, through solar energy. Through a stringent qualifying process, Punj Lloyd was selected as one of the top 30 developers to build and operate solar power plants across the country.

Punj Lloyd was awarded a contract to develop a 5 MW solar PV plant in the Bap region of Rajasthan. In keeping with its principles, Punj Lloyd team ensured that all possible local jobs went to the local community first, so as to create maximum employment opportunities and to acquire community acceptance of the development project.

While executing the project, the Punj Lloyd team gradually understood the region and its people better. Travelling in the interior of Bap, they came across abject poverty and backwardness. Realising that the region required much more than a few employment opportunities, Punj Lloyd planned to undertake a massive, holistic village development programme for the villages surrounding its project site.

# Notes from the field

Travelling in the vastness of a desert, there is one constant realisation that keeps crossing your mind, the over-powering sun and its impact on the land and its inhabitants. For



Punj Lloyd was awarded a contract to develop a 5 MW solar PV plant in the Bap region of Rajasthan





several minutes you will not see a single human being or animal. There is nothing but the sun and sand for as far as your eyes can see. Bap is a similar desert village situated between Jodhpur, Jaisalmer, and Bikaner districts in western Rajasthan. It has a scarce and scattered population. People live in Dhanis (a cluster of few huts, generally in proximity to their fields and usually of the same family or caste). Jats, Brahmins, Bishnois, Rajputs, Muslims, Bheels, Meghwals, Kumhars, Suthars, Nais and Jogis are the common communities of Bap. The poorest of them being from the Scheduled Castes (SCs) like the Meghwals, Scheduled Tribes (STs) like the Bheels, Bhavaris, and Dholis, the other backwards classes (OBC) like Lohars and Langas, Mirasi Muslims, and Odh Beldars. More than 40 percent of the population is Muslim.

The main occupation of the people is cattle husbandry and agriculture. However agriculture remains adversely affected due to lack of irrigation as rainfall is very scarce. Salt farming is done by a sizeable population too.

Bap has 218 villages in total with 32 Gram Panchayats, 5 Senior Secondary Schools, 18 Secondary Schools, 59 Upper Primary Schools,

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316 Primary Schools, 205 Anganwari Centers, 1 Community Health Centre, 6 Public Health Centers and 26 Sub Health Centers. Due to the geographical difficulties existing in the region, Government institutions also fall inadequate in filling the gaps in crucial areas of health, education, women empowerment and employment. To give maximum benefit to people, a focussed approach on identified needs was important. An extensive baseline survey could only reveal the areas which required intervention.

### **Baseline survey**

Punj Lloyd shortlisted **Mandore** and **Sir ki Dhani** as two villages for its pilot programme. Both the villages were within 20 km radius of the Punj Lloyd solar plant site.

The selection of these villages was based on the population distribution of these villages, which was mainly minority (Muslims) and OBCs (Bishnois). The villages were also chosen based on the following criteria:

- Three km away from highway
- Two km away from main road
- Two km away from Anganwadi Center
- Have atleast 25% BPL families
- Preferably have Bheel tribe
   inhabitants
- Zero standard and above school facilities beyond 5 km
- No piped water facility
- Majority male and youth as labourers
- No electricity
- Three km away from either side of the canal
- Without a private doctor
- Far from the market place

After an in-depth background check, Punj Lloyd selected a Phalodi based local NGO – Sahaj Sansthan, which has done extensive work in the fields of livelihood, education and child rights in various regions of Rajasthan, as its implementation partner.

With the help of Sahaj Sansthan,

an extensive baseline survey was undertaken to understand the most pressing needs of these two villages. The baseline survey included every household in the village. A mark was made on each house; 160 houses in Sir Ki Dhani and 130 houses in Mandore, as a stamp of coverage. Village mapping was also done wherein a scaled drawing of each village showed the various Dhanis and their proximity to source of water, religious place, school and hospital. The village mapping helped locate the pockets which were most disadvantaged.

Some highlights of the baseline survey included:

- 30.51% of the total population of both the villages migrated during the dry spell to water rich states like Punjab and Haryana. (451 people out of 1478 people migrated every year)
- The families were dependent entirely on the *tankaas*

(underground system for storing rain water) for drinking water.

- In the absence of a *tankaa* in a family, women walked many kilometers everyday to carry back potable water from other villages.
- The existing *tankaas* provided water for 2-3 months only
- Both villages did not have water pipelines from the Indira Gandhi

Canals supplying drinking water

- The annual income of the families ranged from Rs 30,000-2,00,000.
- No ANM (Auxiliary Nurse Midwife) was appointed for both villages
- 61 students in the age group of 6-14 in both villages did not attend school

Upda

Punj Lloyd set to develop a plan which was holistic, sustainable and community centric. A plan that did not duplicate the Government's efforts but acted as a link between the Government and the villagers







Based on the survey findings, lack of potable water came out to be the biggest crisis in the region followed by education, specially of the girl child, and health facilities. An acute lack of awareness of the availability of Government services, was also found to be a pressing issue.

# Devising a Plan to Fill Gaps

Punj Lloyd set to develop a plan which was holistic, sustainable and community-centric. A plan that did not duplicate the Government's efforts but acted as a link between the Government and the villagers. The idea was not to run a parallel system against Government initiatives but develop a platform which would help people avail facilities and schemes by the Government. Financial expenditure would only be undertaken in areas where Government schemes have not reached.

A comprehensive village development programme consisting of two phases of six months each, was developed for the two selected



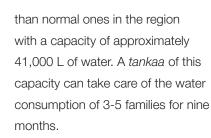
villages of Mandore and Sir ki Dhani.

This pilot project in the two villages were planned make them as model villages and initiatives taken in these villages would be replicated in other surrounding villages in future.

# **PHASE I**

# Integrated Rural Water Harvesting Programme

Water being the biggest challenge, the first phase of the village development programme was dedicated entirely to rain water harvesting. For thousands of years, *tankaas* have been the most popular and convenient means to store rain water in the deserts of Rajasthan. A *tankaa* is an asset to a family in a desert and lasts for generations. Evaluating the benefits of *tankaas*, Punj Lloyd decided to build *tankaas* for the most underprivileged families in the two villages. The *tankaas* proposed by Punj Lloyd were larger The idea was not to run a parallel system against the Government initiatives but develop a platform which would help people avail facilities and schemes by the Government



Based on the baseline survey, families with greatest requirement for a *tankaa* were identified. The selection criterion of the beneficiary family was based on the following strict conditions:

- BPL (Below Poverty Line) family
- Should have a mud hut
- If possible belong to tribal caste (Bheel)
- 2 km away from the main road
- Male member working as
   labourer
- Labour as the only source of income
- No assets like tractor/truck/ tempo
- Family with sheep and goats only.

Forty two families were selected from both the villages based on

This pilot project in the two villages would make them as model villages and initiatives taken in these villages would be replicated in other surrounding villages in future

The rain water harvesting programme was designed in a way so as to provide infrastructural support in the form of *tankaas* and also to link the selected families together and raise their level of awareness on several issues, help them avail their rights from the Government and encourage them towards greater participation in the local administration

the above criteria. Ten *tankaas* (five in each village) were planned to be constructed for these 42 families.

Families were divided into clusters according to their locations. The location of *tankaa* construction was decided by factors such as proximity to all families, the land where the *tankaa* was to be constructed should belong to any one of the families, it should be close to the main road if possible so that passers-by can also avail of the facility.

Endorsement from both Gram Sabha and Gram Panchayat were obtained to secure their help and support in the programme. A mutual agreement was signed amongst the families to state that the *tankaa* did not belong to any one family but was for collective use.

In March 2012, construction of four *tankaas*, two in each village, was started by Punj Lloyd. To ensure community participation, a monitoring committee was formed



in each village to supervise their construction and for their upkeep in future. The committee members included atleast one woman member from each of the beneficiary families, a local school teacher, a Panchayat member and an ANM. Weekly meetings of these committees were held to discuss the shortfalls and progress of the programme. These committee meetings were also used as a platform to bring about social awareness on various issues and to encourage the participation of women members. It was made mandatory for each family to contribute in the construction of the tankaa through their labour - i.e. 'Shram Daan'. The idea behind five days of Shram Daan was to bring a sense of ownership in the people for the programme and the tankaa.

The rain water harvesting programme was designed in a way so as to provide infrastructural support in the form of *tankaas* and also to link the selected families together. The objective was to raise their level of awareness on several issues, help them avail their rights from the Government and encourage them towards greater participation in the local administration so that they could make informed choices.

The beneficiary families were linked to the local veterinary hospital and a local doctor visited their homes once a month. A kitchen garden was also developed around the *tankaa*, to provide vegetables during the dry spell to the surrounding families. This kitchen garden was developed and maintained by the beneficiary families themselves. Pregnant and young mothers of the beneficiary families were registered with the Aanganwadi Centres.

The committee meetings were strategically used to encourage women in sending their children to school. 25% of non-school going children from the beneficiary families enrolled for school by the end of the construction of the *tankaas*. An ANM visit was also arranged for the families who had pregnant women.

# **A Unique Solution**

Unlike the *tankaas* in the entire Rajasthan region which had a pulley system to pull water, using a bucket and rope, the *tankaas* constructed by Punj Lloyd were installed with a hand-pump on top for easy access to water. The ancient pulley system of drawing water had resulted in fatal accidents as the women sometimes slipped inside the well while pulling water with the rope. Sometimes even the rope broke away resulting in the loss of bucket and additional cost of installing a new pulley.

This new technology was welcomed by all beneficiary families and widely appreciated by the local administration.



Punj Lloyd established Bal Sports club in both Sir Ki Dhani and Mandore villages. The space for the club was selected and provided through community voting. One of the secondary Government schools in each of these villages donated a room for establishing these clubs. More than 200 books and sports equipment for football, badminton and cricket were provided to these clubs by Punj Lloyd





In another unique measure the women members of the beneficiary families were distributed free handpump repair kits and were trained by a technician to repair the handpumps on their own. They were also given training on chlorination of the *tankaas*. The annual maintenance and repair of the taankas were the responsibility of these women alone.

After the evaluation of the quality and impact of these four *tankaas*, six more were constructed in the two villages in a similar manner.

### **PHASE II**

# Integrated Rural Community Development Programme

After the success of the first phase, Phase II of Punj Lloyd's village development programme started from October 2012 to March 2013.

The focus for the second phase was on education, health, livelihood, agriculture, animal husbandry, water & sanitation, besides addressing social issues. While Phase I aimed at providing drinking water to selected poor families, reducing their migration to other states and minimising their expenditure on water, the second phase aimed at enhancing knowledge, skills and awareness of the vulnerable and marginalised communities of the entire village so as to bring a long lasting change in their social position and well being. The focus also lay on empowering the communities so that they could make effective use of available resources in Government and non-Governmental schemes and programmes.

A unique strategy was devised for Phase II for greater community ownership, involvement and sustainability of the programme:

- Community centered and community led
- Linkage with Government schemes to bridge gaps between Government services and the beneficiaries through community initiatives
- To facilitate identified interventions
- Not to duplicate Government
   efforts/initiatives

### Education

Punj Lloyd established a Bal Sports club in both Sir Ki Dhani and Mandore villages. The space for these were selected and provided through community voting. One of the secondary Government schools in each of these villages donated a room for establishing these clubs. More than 200 books and sports equipment for football, badminton and cricket were provided to these clubs by Punj Lloyd. The education club has books and also provides plenty of other interesting reading material like awareness posters, quiz and drawing books which are not commonly available in schools.

The sports club has equipment both for boys and girls and students are encouraged to take up sports on a regular basis as a part of their lives. Sports are a medium which do not only bridge the gender gap prevalent in these villages but also bring about several positive changes in the personality of children.

The baseline survey had revealed the list of children who did not attend school. These clubs acted as a centre to draw these children to school through various interesting activities organised by them. Since only school going children were allowed to be club members, several children enrolled themselves in the schools to be a part of the club. A 'Girls vs Boys' soccer tournament was organised by the club. This was a one of a kind tournament in the village, to promote gender equality. The event saw girls break societal barriers and participate. Girls who had never played soccer in their lives were seen kicking brilliant strokes! Rope skipping, soccer, cricket and badminton are the most popular sports in these villages today. 22 children play football and 20 play badminton and rope skipping in each village now, as popular sports.

A total of 15 drawing and cultural competitions were organised in the



two clubs over a period of 6 months. Around 32 children participated in these events. The winners were given trophies and others were motivated and encouraged for active participation in the extra curricular activities of the schools. The clubs have created a healthy environment for children in school for group studies.

With the opening of these clubs, the schools not only saw higher attendance but also increased new enrolments!

# Health

After education, health required immediate intervention going by the baseline survey. Lack of health facilities and awareness on several basic health problems were found to be common. Instead of providing intermittent health facilities, Punj Lloyd wanted to create a sustainable system where people could benefit for a long period of time and were not dependent on an intervening agency.

The first task was to create a knowledge base in the village itself. Ten women were identified and given training as community health workers in both the villages; five females from each village, two adolescents and three women between 35-45 years. These community health workers were also provided a basic kit for first aid and IEC (Information, Education and Communication) awareness material.

Health talks were organised for adolescent girls so that they could be better informed future mothers. Health talks on female health problems were also organised for community women. Monthly visits of an ANM was organised to encourage women to go for complete checkups during pregnancy. These pregnant women were also registered at the Aanganwadi Centres to avail facilities provided by the Government. Benefits of institutional delivery were heavily endorsed to all the expecting mothers.

Six health check-up camps were organised in both villages and a total of 103 patients benefitted. The patients diagnosed in these camps were directed to available Government health facilities for free treatment.

A Government health worker interacted with both men and women to address the following issues:

- Awareness among the communities on preventive health care
- Awareness on health and hygiene through IEC intervention
- Facilitate regular chlorination of water in tanks
- Awareness on all available
   Government health schemes
- Facilitate wider and more effective use of 108 ambulance services

### Livelihood

Geographical and natural limitations of the region make creating livelihood opportunities a big challenge in Bap. Going the sustainable way, Punj Lloyd instead of providing temporary jobs to the local people, focused on providing skill development opportunities which could be put to use locally.

### Stitching training to adolescent girls

20 adolescent and needy girls were identified in both the villages for training in stitching of clothes. Two sewing machines were provided to each village. The educational cum sports clubs in each village were transformed into training centres for a few weeks. These sewing machines were not provided to any individual, but were given to girls on a rotation basis. Today three girls stitch clothes on a professional basis and earn their livelihood. They inspire several other girls and impart training to interested girls.

### Training in hand made food items

Two '*papad*' making and '*sevaiyaan*' making machines were provided for training 20 girls in both villages through a five day workshop. Experienced women from the community itself taught these adolescent girls the art of making







The first task was to create a knowledge base within the village itself. Ten women were identified and given training as community health workers in both the villages. These community health workers were also provided a basic kit for first aid and IEC (Information, Education and Communication) awareness material





Agriculture and animal husbandry form a very important part of existence in desert villages. Animals are completely dependent on the plantations for their food and people are in-turn, completely dependent on their animals for other products and services like milk, fur, agriculture etc. locally flavoured papads and sevaiyaan! These papads were either consumed in the homes of the girls or were sold on commercial basis.

### **Electrician Training**

Although houses in the villages of Bap block do not have electricity, there are many industrial and factory set-ups emerging in the area which run on gen-sets or solar powered electricity. Identifying the need for local electricians in Bap, Punj Lloyd shortlisted 13 adolescent boys from the two villages and provided them basic training of an electrician. These boys not only started with odd jobs, but also inspired other boys to take up similar vocational trainings.

# Agriculture, plantation and animal husbandry

Agriculture and animal husbandry form a very important part of existence in the desert villages. Animals are completely dependent on the plantations for their food and people are in-turn, completely dependent on their animals for other products like milk, fur etc.

Punj Lloyd ensured that all the *tankaas* built with its support had adjoining kitchen gardens setup with community support. 20 kitchen gardens with 130 plants were setup such as Neem and Rohira.

Since agriculture is the main occupation of the area, it is important for people to get maximum output from their agricultural produce. Villagers were generally found to be ignorant of the various precautions to be taken in times of a drought, insects attack and on selection of the right type of seeds based on their soil type. Punj Lloyd facilitated the visit of a soil and agriculture expert in the area. Soil testing was done on farmland in each village and tips and advice were given to villagers in an awareness session. Free of cost seeds provided by the Government were facilitated for the villagers.

Five people were identified from both the villages for veterinary training. A veterinary doctor visited the area and trained these representatives for animal health and other precautions. Villagers were also counseled on insurance of their animals through Government aided plans. These trained people were given orientation sessions every three months.

# **Social issues**

Several awareness talks and sessions by experts were organised in both villages on rights of the girl child, women rights, thorough community building celebration of national holidays like Independence Day, Republic day, Teacher's Day etc, need for hygiene and sanitation, encouraging construction of toilets, promoting sports and youth empowerment etc.

Complete birth registration, death registration, widow pension, old age pension, senior citizen certificate were facilitated for villagers. Seven birth registrations, one death certification, four widow pensions, three old age certifications and 12 old age pensions were successfully started with the help of awareness campaigns and facilitation initiatives.

The success of Punj Lloyd's interventions in Bap is reflective of the company's approach towards inclusive community development at all its project sites. It also is a testimony for a well planned, sustainable, all inclusive community, whose actual benefits will be seen years after the intervention is over!. •



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