

# NEWS & VIEWS

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## STANDING TALL

L&T To Build World's  
Tallest Statue

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# Business India Spotlights Leadership Role of Mr. A.M. Naik

**B**usiness India -- one of India's oldest business magazines -- brought into sharp focus the extraordinary leadership of our Group Executive Chairman, Mr. A.M. Naik, in the recent cover story on its prestigious annual feature 'Businessman of the Year'.

The editorial traces Mr. Naik's successes on multiple fronts and says that it is "the stuff corporate legends are made of". Describing Mr. Naik as a 'Master Builder', the article comments: "while lifting L&T to an enviable position today, Mr. Naik has also been responsible for steering the company through economic cycles."

Looking ahead, the editorial observes that given the new political and economic climate, with its emphasis on 'Make in India', L&T is not only "very well placed to take advantage of the business opportunities, but is also ready to play a constructive role in nation building. This is the vision of Naik who is also a true patriot."

The cover story also features comments of several industry stalwarts on Mr. Naik's remarkable leadership abilities. They include: Mr. Deepak Parekh, Chairman, HDFC, Mr. Shashi Ruia, Chairman, Essar Group, and Mr. Harsh Goenka, Chairman, RPG Group.

The magazine declared Mr. Naik as the 'Businessman of the Year' recently. The jury which deliberated on the prestigious award comprised a panel of top business leaders and professionals and was chaired by Mr. Chandrasekaran, CEO & MD of TCS.



## Higher Danish Honour for Mr. Naik

**M**r. Naik, has been conferred the Order of the Dannebrog as Knight - First Class by Her Majesty Queen Margrethe of Denmark.

This honour represents a progression of the accolade that Mr. Naik received from the Queen of Denmark in 2008.

The knighthood is Danish Royalty's acknowledgement of Mr. Naik's role in fostering Indo-Danish ties in the fields of business, commerce and culture.

A formal investiture ceremony will take place in March 2015.

The Order of the Dannebrog is one

of the world's oldest Knight Orders, having been instituted in Denmark in 1671.

Mr. Naik is also the Honorary Consul General of Denmark in Mumbai.

# Mr. U.V. Rao, Former CEO of L&T, Passes Away



04.12.1929 - 24.01.2015

Mr. U.V. Rao, former CEO of L&T, passed away in Bangalore on January 24, 2015.

Mr. Rao had joined the Company in 1956. His early career was marked with success in the Company's electrical and electronics business. After holding a succession of key positions, Mr. Rao was appointed Whole-Time Director in 1973. He took over as Chief Executive Officer (CEO) in April 1989.

He led the Company for the next five years, successfully overcoming the economic turbulence of the early 90s and initiating early steps to take advantage of the emerging opportunities of a liberalized environment. Mr. Rao retired from the services of L&T in 1994.

Mr. Rao is survived by his two sons. The Company extends its condolences to the bereaved family.

# Soaring Tribute to Unity of India



*Sardar Patel - Maker of Modern India.*

Records are familiar territory for L&T. If you see something that qualifies as the world's largest, longest, heaviest, highest... chances are you will find the L&T logo under it. All of which leads us to the new record that we are working on – the world's highest statute. Unlike other records which may not be known outside specific industry circles (e.g., not many know that we have built the world's largest EO reactor), our prospective candidate for the Guinness Book is already very much in the public eye. When complete, the Statue of Unity will dwarf all competition, soaring effortlessly over the Statute of Liberty, the Redeemer et al. For L&T and for L&T-ites, it's yet another record. Yet another feather in our caps – this time perched 182 metres high!

Until recently Sadhu Tekri was just another hillock, one out of the countless many dotting the arid landscape of East Gujarat's Narmada district. Barring a handful of locals, few could even identify the mound with certainty. And those who could ascertain its precise location didn't think much of Sadhu Tekri's unique geography or its natural aesthetics. For them, it was about as special as the next hillock they saw.

All that changed, however, on October 31, 2013, when the then Chief Minister of Gujarat, Mr. Narendra Modi, visited the obscure site and laid there the foundation stone for what the world would soon come to know as the 'Statue of Unity' project.

A colossal statue of Sardar Vallabhbhai Patel would be erected on

the hillock, he announced to the world. Everything from the statue's dizzying dimensions to the scale of engineering which it would require to what made Sadhu Tekri ideal for the upcoming endeavour, was discussed with great interest by the media and the public at large.

By the time the ceremony ended, Sadhu Tekri was, as they say, firmly on the map. Not bad for a knoll which was virtually unidentifiable a few hours before!

Few projects in the recent memory have been the subject of such curiosity as the Statue of Unity. Such is the level of interest in the enterprise that anything even remotely connected with the project makes the national news. While we in India are no strangers to large statues of historical figures, the stakes

involved in this sculpture seem far higher than anything seen previously.

## A Colossus Like No Other

Located on the Sadhu Island (the plan is to flood the area surrounding Sadhu Tekri by constructing a weir which will direct the waters of Narmada and create a reservoir) approximately 3.5 km downstream from the Sardar Sarovar dam, the 'Statue of Unity' will stand 182 metres tall. Its construction will involve roughly 75,000 cubic metres of concrete, 5700 metric tonne steel structure, 18,500 tonne reinforced steel rods and 22,500 tonne bronze sheets. At the base of the statue will be an exhibition centre and a memorial garden while a designer bridge will connect the island with



*The Chief Minister of Gujarat, Mrs. Anandiben Patel, performs bhoomi pooja for the Statue of Unity Project on October 31, 2014 at Kevadia Colony, Narmada Dist - Gujarat.*



*The observation deck at 500ft of the statue can accommodate 200 people at a time. The panoramic view from this level will enable visitors to see the beautiful Satpuda and Vindhya mountain ranges, the 256 km long Sardar Sarovar Reservoir and the 12 km long Garudeshwar Reservoir.*

### More than a Statue

The 'Statue of Unity' will incorporate multiple facilities. Here is a preview:

- The statue is 182 metres tall
- A 6,850 sq. m. exhibition centre showcasing the life and times of Sardar Patel
- A 250 metre long designer bridge connecting Sadhu island to the mainland
- A memorial and a visitors' centre
- 4-laning an existing 5 km internal roadway
- An administrative complex, star-rated hotel and conference centre
- A 40 metre suspended fabric roof structure for the visitors' centre

the mainland along Narmada. It will also host an administrative complex / a management hub-cum-star rated hotel (Shrestha Bharat Bhavan) and a conference centre.

The project awarded to the Buildings & Factories Business of L&T Construction in October 2014, is worth Rs. 2989 crores and is scheduled to be completed within 42 months. When complete, the site will have the biggest statue in the world which will tower over the 153 metres tall Spring Temple Buddha in Henan, China, by close to 30 metres. It will be nearly twice the size of the famous Statue of Liberty and over 4.5-times bigger than Christ the Redeemer, in Rio de Janeiro.

A towering piece of engineering, the statue is conceived as a naturalistic depiction of Sardar Patel in his characteristic garb, in a walking pose. It will have a unique slender width to height ratio and rise out of a star-shaped, geometric base that will cover the entire Sadhu Island. The structure will have two vertical cores each housing a high-speed passenger elevator for

# Taller than the Tallest in the World



Statue of Unity  
Gujarat  
India

182 m

Spring Temple Buddha  
Henan  
China

153 m



Ushiku Daibutsu  
Japan

120 m



Statue of Liberty  
New York  
USA

93 m



The Motherland Calls  
Volgograd  
Russia

87 m



Christ the Redeemer  
Rio de Janeiro  
Brazil

38 m

carrying visitors to the viewing gallery at 153 metres, at the chest level, which will offer an expansive view of the Satpuda and Vindhya mountain ranges, the Sardar Sarovar Reservoir and the Garudeshwar Reservoir. The vertical cores will also lend support to the space frames to which over 12,000 bronze panels will be clad.

## Old Hands at Conquering Complexities

Bagging the contract for the Statue of Unity was a matter of great pride for L&T. In the words of Mr. S.N. Subrahmanyam, Member of the Board & Senior EVP (Infrastructure & Construction), L&T, "It re-affirmed the confidence that people have in L&T to build complex structures."

Mr. Subrahmanyam doesn't exaggerate. At L&T, we specialise in executing complex construction projects. The famous Baha'i Temple is perhaps the best representation of L&T's capability of managing complexity in construction. Speaking of complex, one of the most intricately curved geometrical structures in the world, the Lotus Temple, has three rows of nine thin concrete shells forming the petals (total 27 petals) with a dome, surrounded by nine pools. These pools are surrounded by walkways with beautiful curved balustrades, bridges, and stairs, representing the floating leaves of the lotus.

The ATC Towers at various international airports across the country are engineering marvels of tall, slender structures, the tallest being the 101-metre tower at New Delhi International Airport. In the area of high-rise residential complexes, at Worli in the heart of Mumbai, taking shape are three towers of 76, 75 and 60 storeys with the tallest rising to 324 metres.

The Panval Nadi viaduct, designed and constructed by L&T for Konkan Railway at Ratnagiri in Maharashtra is



*The statue will be located on the Sadhu Island in the Narmada River, approximately 3.5 km downstream from the Sardar Sarovar Dam.*

Asia's tallest that rises to a height of 60 metres and spans Panval Nadi at 420 metres in length. As far as bridges go, the second Vivekananda Bridge across the river Hooghly is a landmark. L&T constructed the 880 metre long bridge that comprised a deck that is a box structure with 7 extra-closed cable stay spans of 110 m each and 2 end spans each of 55 metres.

Further, L&T's expertise in creating outstanding public places is well represented by HITEX (The Hyderabad International Trade Exposition Centre) that provides world-class infrastructure to international exhibitors and serves as a one-stop resource, providing the right setting for international exhibitions, trade shows and corporate events.

The Statute of Unity will rise on the strength of L&T's world-class design-and-build prowess, project management capabilities, backed by robust resources.

## More Than a Contract

Statues are one of humanity's oldest obsessions. Our history is littered with examples of this distinct desire that resides in the deepest corners of the human heart. While in some cases,

memorials were erected to serve a particular religious or political end, there also exist structures which were born out of an individual need of the mighty and the powerful of the day to make emphatic declarations of personal beliefs.

That said, the Statue of Unity has a purpose, far higher and much nobler than any of the above. It's intended to remind us to stay united as people and for us Indians no other historical figure espouses that sentiment more strongly than Sardar Patel, the man who gave us a united India.

And so it is fitting that a monument of this magnitude is being built to give obeisance to the "Loh Purush". We at L&T believe the contract to be a rare honour and a privilege. To put our collective expertise to use and create something of this size is a matter of great pride.

As India's foremost construction organisation, L&T has been associated with countless projects of national significance and met, very often exceeded the demands of some of the toughest projects on earth.

And we're up for the challenge, yet again!

# L&T Heavy Engg., Oman, Ships World's Largest Heat Recovery Package



Contributions of Omani Nationals, High 'In Country Value' and Excellent Safety Record mark coming of age of Oman Heavy Engineering facility.

**L&T** Heavy Engineering LLC, a joint venture between L&T and The Zubair Corporation of Oman recently earned the distinction of supplying the world's largest Heat Recovery Boiler for Gasification Plant to SCHMIDTSCHKE SCHACK, ARVOS Group, Germany, for Reliance Pet Coke Gasification Project. The project comprises 10 sets each of Heat Recovery Boilers, High Pressure Steam Drums and associated High-pressure Piping.

The Company achieved the unique milestone recently when the first lot of equipment was flagged off from its Sohar facility in the presence of a team from SCHMIDTSCHKE SCHACK and the board members from L&T Heavy Engineering LLC.

The equipment for Heat Recovery for the Gasification plant is unique in many ways and has dimensions

previously unheard in the industry – the Heat Recovery Boiler alone weighs over 630,000 kg and is over 45 metres in length. The Company completed the first phase of the project by combining the most modern techniques in fabrication, comprehensive project monitoring systems and the latest technologies for non-destructive testing. One of the highlights of the project was indigenously developed automations for welding which played a crucial role in the success of the entire exercise.

Speaking on the occasion, Mr. Y. S. Trivedi, Chairman of the Board of Larsen & Toubro Heavy Engineering LLC, remarked on the “coming of age” of the facility in the Sultanate. He reiterated L&T's commitment towards His Majesty Sultan Qaboos's vision for In Country Value and playing a vital role towards non-oil sector contributions to

the economy. Mr. Trivedi also singled out the contribution of Omanis in the manufacturing of the equipment and said that the pride of being associated with such ground breaking projects will provide further impetus for the new generation to participate in the manufacturing sector.

The delegation from SCHMIDTSCHKE SCHACK, ARVOS Group, was led by Project Director, Mr. Erik Ullrich, who speaking on the occasion reflected on the experience and said that the achievement shall be etched permanently in the memory for everyone involved with the project. He complimented the engineering skills and unflagging efforts exhibited by L&T and encouraged the team to achieve the completion of the project to the satisfaction of the end user while maintaining a “No Lost Time Incident” status.

# LTS 3000 - Proven Capabilities for Offshore Installation



*Tower Yoke Mooring facility installation by LTS3000 at Lampung field, Indonesia.*

Whether it's stationary or on the move, whichever way you look at LTS3000, it's a sight to behold. Stretching an impressive 161 m, the heavy-lift-cum-pipe-lay vessel has 2000 sq. m of free deck area and is fitted with a 3000ST main crane and two 50 MT deck cranes. With a capacity to house 290 personnel and a design perfectly suited for Jacket/Topside offshore installation and laying Subsea Pipes (6" to 60" diameter), LTS3000 is everything that a heavy lift vessel should be and more.

Owned and operated by L&T Sapura Shipping Private Limited (LTSSPL),

a joint venture company with SapuraKencana Petroleum Berhad, Malaysia, the vessel has been in offshore operations since June 2010. During this time, LTS3000 has installed more than 65 offshore structures including jackets, topsides and bridges and laid more than 200 km of sub-sea pipes at various oil fields in India, Indonesia, Malaysia, Myanmar and Vietnam.

Some of LTS3000's successes include installation of India's biggest offshore jacket (a massive structure weighing a staggering 13,500 MT) for ONGC's MHN project, installation of 2,719 MT Central Processing Platform (CPP) Topside at New Field East Piatu in Malaysia and

erection of three Wellhead platforms along with 21 km sub-sea pipelay for Zawtika Project off the coast of Myanmar.

## The Zawtika Project

LTS3000 played key role in Zawtika Development Project Phase 1A. It was L&T Hydrocarbon Engineering's first foray in South-east Asian market. The project saw 3 jackets of length 150-170m and weighing 6,800-7,800MT getting launched back to back in around 2 months.

Being one of the first contractors to mobilize in the virgin field, LTS3000



*LTS3000 lifting 2719 MT CPP Topside.*

faced numerous challenges including hard soil conditions and rough weather. Plus, the water depth posed additional challenge of installing long jackets and piles, some that ran the length of a football field.

Advanced technical specifications of LTS3000 main crane enabled team to use innovative techniques to install long length single piece piles of 143 metre. Unique dynamic pile upending technique was used to launch these piles. An in-house software program 'Dynupend' was developed to estimate motion of the pile during free-fall by considering self weight, hydrodynamics and inertia forces each time. Loads and stresses throughout the length of pile were calculated at every single stage of upending.

Another challenge was the rigging arrangement to lower hammer to depths of 120-140m to drive piles in skirt sleeves on the jacket. With suitable wire rope cleaning system in place, the LTS3000 crane enabled easy handling of hammer for driving a total of 24 piles for erecting these 3 mammoth jackets. Thanks to the winch system of LTS3000 crane, complex rigging arrangement for lowering the hammers was avoided

and valuable time was saved at offshore.

The advanced pipelay system of LTS3000 with its two robust Pipe Tensioners, which provide 100MT tension each, proved its capability while laying 21km of 18" concrete-coated intra-field subsea pipeline at 140m to 160m water depths.

LTS3000 was the first construction vessel to work in Zawtika Field completing both, platform installations and pipelay as per agreed schedule.

Zawtika project is yet another crowning achievement for LTS3000.

## The Big Lift

LTS3000 crane was put to another test during installation of offshore facilities of East Piatu CPP Platform Phase-II for Newfield Peninsula Malaysia Inc. The scope of work included installation of 2,719 MT CPP topside, 115.4 MT CPP U-301 & 115.4 MT U-321 compressor, 741.3 MT CPP LQ Module, 75.7 MT CPP Bridge and 41.4 MT CPP U-360 Mercury Removal Unit in a water depth of 70 metres. Here the vessel was being tested to its limits. As the vessel was about to execute lift close to maximum capacity, high level engineering precision and seamless coordination with operations team was required.

Integrated Automation System (IAS) on board LTS3000 helps to keep watch on critical parameters like tension on mooring wiches, ballasting data, valve positions and available power during heavy lift. The shore-based vessel management team, Master and Superintendent carried out pre-lift analysis including max draft and trim during the lift based on the data shared by the project team. A complete systems check was done prior to the

### An 'EPIC' Saga

When the induction of a vessel that could handle offshore installation, a new dimension was added to L&T's EPC capabilities for offshore projects. EPC or Engineering Procurement & Construction became EPIC – with 'Installation' complementing our capabilities.

'LTS' - formed by the initials of L&T and of SapuraKencana has made a name for itself in the offshore industry with a long and growing list of accomplishments. These include:

- Over 65 offshore structures installed
- More than 200 km of sub-sea pipelines
- Participated in installation of 13,500 MT jacket
- Achieved lay rate of 220 joints per day
- Main crane facilitates innovative solutions to operational challenges
- An on-board 'eye' monitors all critical parameters
- Geographies covered: India, Indonesia, Malaysia, Myanmar, Vietnam



*Upending 143 m single piece pile in Zawtika field, Myanmar.*

lift and LTSSPL ensured that all the lifting gears including the main crane were serviced properly and ready for the task.

As the day broke, construction crew on board LTS3000 geared up for the 'big lift'. Gifted by weather God, calm sea and clear skies indicated favourable conditions for the job. The team roared in action. Barge carrying Topside was brought to stern of LTS3000. Around 10.35 am, the lift operation commenced. Sea-fastenings were cut and LTS3000 slowly and steadily lifted giant structure with the main crane. The crane load display indicated 2,719 MT load at 27.3 m radius. LTS3000 was lifting a structure very close to its maximum capacity of 3000 ST. No sooner than the vessel moved towards the jacket and lowered the topside in its place on the structure, the welding team swung into action and got down to work. As the topside was being welded to the jacket, a team member on board the vessel quipped, "A big lift off our mind." Truer words had never been spoken.

### Other installations by LTS3000

LTS3000 achieved a lay rate of 220 joints per day (approx. 2.6 kilometre per day) during 24"x75 km subsea pipeline between MUDA Drilling Platform and

PLTS at 65 m water depth for Trans Thai Malaysia Sdn Bhd in JDA Field between Malaysia and Thailand.

The vessel also completed laying of 16"x19 km and 26"x20 km subsea pipeline for Vietsovetro (VSP) in Dai Hung Field and Nam Con Son Field, Vietnam respectively in 2014.

Besides, LTS3000 has also played a decisive role in installation of offshore structures including jackets, topsides, flair boom, interconnecting bridges helping many prestigious Oil & Gas companies in South East Asia and Indian region over the last 4 years.

Some of the other recent structure installed by LTS3000 include:

- Installation of Bertam WHP jacket (1,508MT) and Drilling Deck (134MT) in 75 m water depth for Lundin B.V. Malaysia (LMBV) in Bertam Field, Malaysia.
- Installation of DMDP topside for Petronas Carigali Vietnam Limited (PCVL) in Diamond Field, Vietnam. Water depth approx. 40 m.
- Installation of 4 legged jacket (518 MT), Yoke Arm (246 MT) and Top side (688 MT) in 24 m water depth for PT. Rekayasa Industri (REKIND) in Lampung Field, Indonesia.
- Installation of BEDP-A Cellar Deck Extension (178 MT), LADR-A, 4 legged jacket (1,548MT) Dry Lift,

LADR-A topside (620 MT), F14DR-A, 4 legged Jacket (4,217 MT) wet lift, F14DR-A Topside (1,630 MT), F23R-A module 3 (1,725 MT), D12DR-A jacket by Double Block Upending (749 MT), D12DR-A Topside (650 MT), D35PG-A cellar Deck (155 MT) in 50 m water depth for Shell Sarawak Berhad in Laila field, F14 field and D12 Field, Malaysia.

- Installation of SN-PA Topside (2668 MT), SN-AA Topside (1,375 MT), SN-PA(WHP) Topside (248 MT), SN-PA Flare Boom (49 MT), SN-PA/SN-AA Interconnecting Bridge (54 MT), SA-PA Topside (2,595 MT), SA-AA Topside (867 MT), SA-PA(WHP) Top side (263 MT), SA-PA Flare Boom (52 MT), SA-PA/SA-AA Interconnecting Bridge (52.5 MT) in approx. 34.8m water depth for Murphy Sarawak Oil Co. Ltd, in oil field near Sarawak, Malaysia.

Successful offshore installations and pipelay for prestigious Indian and International clients by LTS3000 are striking symbol of collective effort, dedication and commitment exhibited by the project team, on-board crew and shore based vessel management team to integrate and excel with each member responding with great enthusiasm, vigour and strength.

As we trade into new frontiers, offshore installations are becoming larger, more complex and therefore more challenging. The challenge for LTS3000 is to match the needs of clients and execute projects faster and safer. The synergy between employees at the office and people working on-board is very important to meet these challenges. Impressive track record of LTS3000 in last four years is indication of this synergy. With technically competent team running the vessel, LTS3000 is ready to execute offshore installations safely and within budget helping EPC contractors meet tough deadlines in Oil and Gas fields across multiple geographies.

# L&T-VALDEL: Scripting Success in Upstream Oil & Gas Industry



In the nearly 25 years of its existence, L&T-Valdel Engineering Limited (L&T-Valdel / LTV), the engineering arm of L&T Hydrocarbon Engineering (LTHE), for its Upstream Offshore Hydrocarbon Business, has seen multiple avatars. And yet, one thing has remained constant throughout its narrative: success. With

its world-class engineering skills and offshore expertise, this wholly-owned subsidiary of L&T has delivered over 400 projects across the globe. L&T-Valdel has helped LTHE and several other global industry majors deliver mega Engineering & EPC projects in some of the most challenging environments in the world.

LTV's domain of expertise covers diverse lines of business, like Wellhead Platforms, Process Facilities/Platforms/Complexes, independent Process & Utility Modules, complete FPSO Topsides facilities, Riser & Pipeline systems, Jack-Up Rigs and MODU to MOPU conversions, and spans the entire engineering value chain: Concept

studies, FEED/Basic engineering, Detailed engineering utilising complex 3D tools & systems, Procurement engineering, As built documentation, Pre-service engineering and Marine installation support.

LTV also performs niche analyses and studies like Transient Flow Analyses using OLGA; Dynamic Simulation; Relief & Blowdown studies; Radiation & Vent Dispersion studies; Finite Element Modelling & analyses of critical joints, Pushover Analyses, Boat Impact Analyses & Time Domain Analyses for Rare Intense Earthquakes using USFOS, On-bottom Stability using AGA, Floation studies for buried pipelines due to earthquake and wave action, On-bottom Roughness analyses using SAGE Profile 3D software, etc., as part of the services offered.

The exceptional oil & gas facilities engineered by LTV for its clients, speak volumes about its unswerving commitment to quality and schedule adherence.

## Recent Successes

### Fixed Facilities

#### Yetagun Phase V Development:

Wellhead Platform (New Topsides & Jacket 120m), Subsea Pipelines, Modifications on Yet-C, Tie-in and Hook-up to existing facilities

Client: Petronas Carigali Myanmar (Hong Kong) Ltd.

Scope: FEED verification, Detail Engineering, Procurement assistance and Tie-in & modification work

#### MHN Process Complex:

Process Platform (Jacket 13500MT, Topside 28000MT), Living Quarters (for 150 men), 3 Flare platforms, 4 bridges (57m – 140m long) and modifications for tie-in to existing MNW Platform

Client: ONGC

Scope: Concept, Detailed Engineering, Procurement engineering, installation engineering and hook-up/ commissioning assistance

#### HRP II 3 Well Platforms Project:

3 smart Wellhead Platforms HK, HSD & HP, comprising 12 well slots each, with pre-installed Risers & Subsea composite cables

Client: ONGC

Scope: Detail Engineering and Procurement assistance

#### Nasr & Umm Lulu Field Development Project Phase I:

4 Wellhead Platforms, 1 Manifold/ Riser Tower (2000MT+ each), 1 bridge, Sub-sea pipelines and modifications in Zadco complex

Client: ADMA OPCO

Scope: FEED endorsement, Detail Engineering, Procurement engineering, including Concept of 'MFT' Topside split, Installation engineering and Field engineering

#### DDW1 Wellhead Platform:

High Pressure High Temperature (HPHT) Wellhead Platform (combination of 810 Bar (g) & 175 Deg C respectively)

Client: GSPC

Scope & highlights: Detail Engineering and Procurement engineering; API-15000 psi rating material due to HPHT; Complete production & test systems built out of Duplex Stainless Steel (first time in India); 16 well slots' Wellhead Platform with an unusual 6 leg jacket configuration (as Deck structure was designed for 6000MT modular rig load)

#### FPSO Projects & Jack-Up Rigs Cluster-7 FPSO

Client: ONGC

Scope: Concept, Basic Engineering, EPC Tender preparation, EPC bid evaluation, Owner's PMC & Completion Certificate

T.E.N FPSO: Complete FPSO topside comprising 16 modules and Piperacks

Client: MODEC / Tullow Oil (Ghana)

Scope: FEED, Detail Engineering of complete FPSO Topside and Procurement engineering

Capacity: 80,000 BOPD Oil, 170 MM

SCFD Gas

OSX-3 FPSO: Complete FPSO topside comprising 12 modules and Piperacks

Client: MODEC / OSX

Scope: FEED verification, Detail Engineering of complete FPSO Topside and Procurement engineering

Capacity: 100,000 BOPD Oil

#### Offshore Jack-Up Rig Sagar Uday:

Major Lay-up and repair of Rig Sagar Uday (3 legged, triangular type)

Client: ONGC

Scope: Pre-engineering survey, Detail engineering, statutory approvals from ABS & IRS, interface engineering, Procurement engineering, yard support, operating & commissioning manuals & As-built documentation

## Pipelines

#### Yetagun Phase V Development Project

Client: PCML

Pipeline Scope: New 10", 11.2 Km Pipeline

#### C-Series Project

Client: ONGC

Pipeline Scope: Design of 4 Well fluid pipelines (8"-28", 2.2-114 Km) & 1 J-Tube, Procurement assistance

#### Nasr & Umm Lulu Field Development Projects Phase I

Client - ADMA OPCO

Scope: (i) Nasr: 80 km of Sub-sea Pipelines, size: 10-20", Water Depth: 14-37m

(ii) Umm Lulu: 22 km of Sub-sea Pipelines, size: 8-14", Water Depth: 9-21m

#### MHN Pipelines & Modifications Project

Client: ONGC

Scope: Detail engineering of approx. 80 km of Sub-sea Pipelines varying in Length from 10"-16"

### L&T-Valdel – Delivering value through project excellence

The word 'Valdel' in L&T-Valdel is a portmanteau of the words 'Value' and 'Delivered'. Value Engineering is the cornerstone of LTV's excellence in project execution. Operational

excellence is a key value driver in L&T-Valdel's global delivery model. LTV's business processes are oriented towards creating value and improving the quality of deliverables on a continual basis.

L&T-Valdel's engineering expertise is backed by an institutionalised

system of Route Maps, Standard Operating Procedures and Knowledge Management. While this enables LTV to ensure faster and more accurate deliverables, the value-add perceived by LTV's customers has resulted in LTV securing several repeat orders over the years.

### Some of the Recent mega projects engineered by LTV



*HRP II 3 Well Platforms Project for ONGC.*



*MHN Process Complex project executed by L&T for ONGC.*

<b>LTV's Achievements</b>	
•	60+ new Wellhead Platforms
•	3 Process Platforms/Complexes
•	10 FPSO topsides projects, including 6 complete topsides
•	70+ Process & Utility Modules (including Acid Gas Recovery, Dehydration, Gas Compression, Power Generation, etc.)
•	220+ Platform Modification/ Revamp Projects
•	4 Living Quarters-cum-Control Platform Projects
•	200+ Subsea Pipeline Segments (few complete with fiber optic cables & flexible pipelines)
•	2 Offshore Drilling Rig Projects
•	1 MODU to MOPU conversion



*Engineering Nasr & Umm Lulu Field Development Project Phase I for ADMA OPCO.*



*L&T carried out refurbishment and modifications of the Offshore Jack-Up Rig Sagar Uday for ONGC.*



*In house engineering expertise enhances L&T's ability to respond positively to the changing dynamics of offshore projects.*

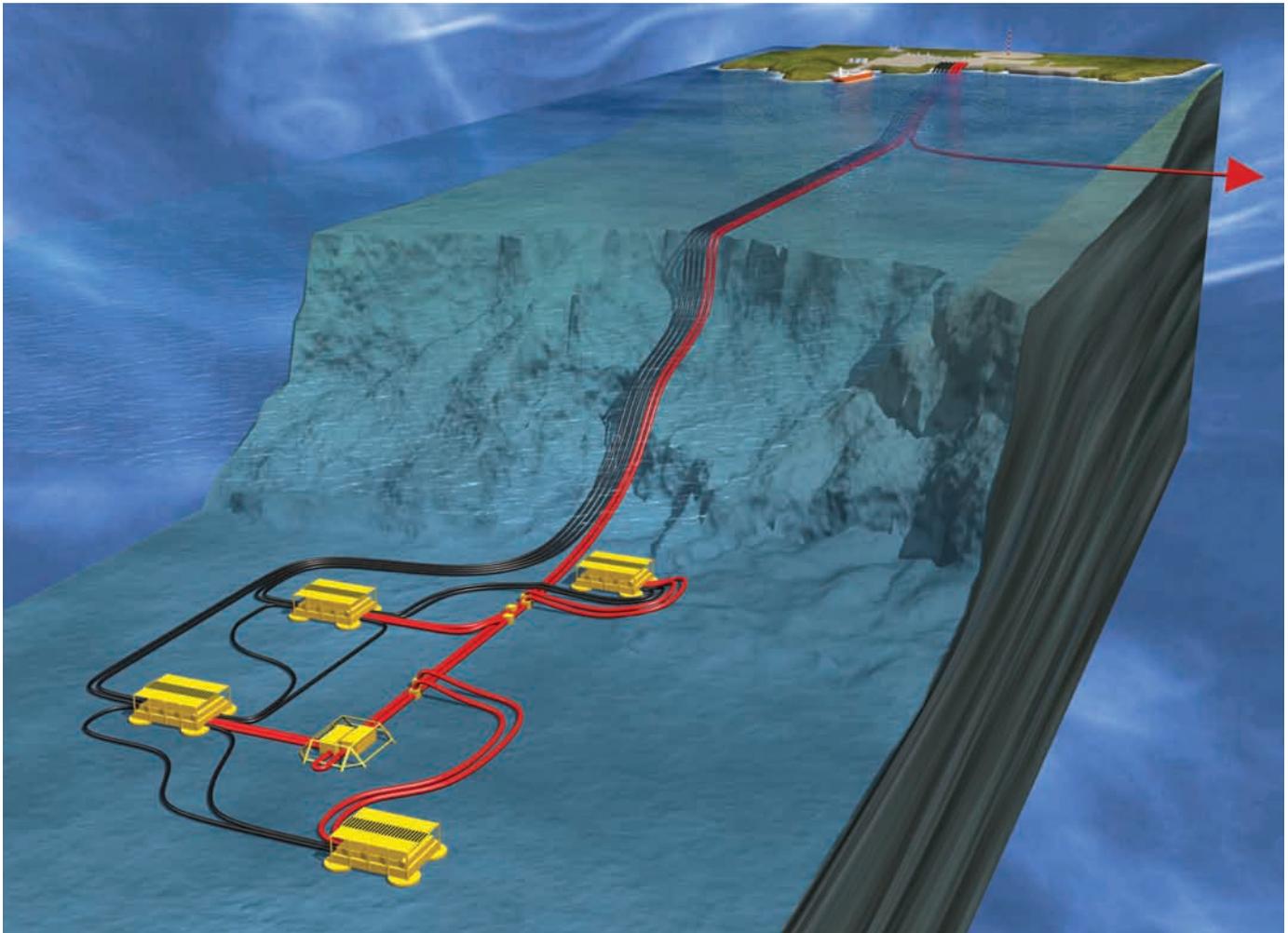


*DDW1 Wellhead Platform project of GSPC.*



*Cluster-7 FPSO project carried out for ONGC.*

# The Subsea World



*Typical pipe laying work done at subsea.*

Driven by a growing demand for energy and depleting conventional fields onshore and offshore, the market for global deep water exploration and production has been growing steadily over the last few years. Aided in part by significant advancement in technologies which allowed companies to explore deep water geologies, global oil & gas majors are now fast moving on from subsea production systems to subsea processing, facilitating more efficient extraction and transportation

methods. The Sub-sea production system comprising of subsea drilling, subsea Christmas-trees and wellhead systems, deepwater umbilical and risers, subsea manifolds and jumper systems, tie-in and flow-line systems & controls installed in deep-water environment facilitates the continued operations without getting affected by the waves & currents at the sea-surface, thus assuring lower down-time in deep-water fields.

The nature of this industry demands innovative technology depending

on the field conditions and general infrastructure available in the region. Additionally, the industry necessitates that mitigation measures are built-in to contain any 'rogue behaviour' of the wells or handle any other eventuality. It is therefore important to build regional expertise to support this niche industry. There's ample evidence that suggests that wherever there has been a thrust for deep water industry, the local industry has always made a significant contribution. The extensive local support system to support deep

water oil & gas industry in markets of North Sea, Gulf of Mexico, Brazil, South East Asia and Australia serve as strong cases in point.

The challenges in developing a deep water field are multidimensional. To start with, there is very little data available on meteorological, sub-sea and geophysical conditions. With little or no data available, it becomes very difficult to set the basic design parameters. The high external pressure & low visibility in deep water brings in additional responsibility on structural stability and access for operations. Any subsea intervention involves expensive marine spread and access constraints driven by weather, visibility and other operational limitations.

Apart from the external constraints in terms of stability and access, firms have to deal with process constraints related to the reservoir/fluid properties – at low-temperature, high-pressure. Evacuation of the product safely and efficiently to the host facility, onshore or offshore has a significant impact on the viability of the field. Most or all of the flow is multiphase flow and the transporting flow line profile has significant impact on liquid hold up and hydrate formation. Further, fluid characteristics can change over the field life causing significant changes in flow parameters. It is therefore important to access and arrive at the most efficient flow pattern with reasonable contingencies through flow assurance studies.

Product evacuation also involves the choice of right metallurgy to ensure that the corrosion and erosion parameters associated with the flow are under control. Corrosion monitoring is also an important aspect to ensure safety of the system and the environment. The material selection has to not only cater for robust fluid characteristics but also allow for contingencies in case the fluid characteristics change over the life of the well. Apart from the fluid chemistry, the material selection needs to cater

for the high flow temperatures within the line and extremely low ambient temperatures outside. Depending on design conditions, insulated lines/pipe in pipe solutions may have to be considered which has a significant impact on construction time and installation methods.

It is therefore critical in deep water projects to get the engineering right and build-in enough contingencies to cater for any predictable eventuality.

Deepwater installation is a challenging activity involving deployment of high-end dynamically positioned vessels capable of maintaining their position at locations where conventional mooring is not feasible. These vessels are equipped with remotely operated vehicles (ROV) and special tooling equipment specific to subsea interventions. Since subsea production systems are located on seabed and in water depths exceeding the operational limits of normal diving and saturation diving system, all the operations have to be

carried out using ROVs coupled with dedicated subsea tooling equipment. Metocean conditions have great impact on installation activities and puts equipment as well as the facility at risk if not managed accurately, safely & efficiently. In essence, selecting correct installation fleet with optimum equipment and managing the interface is critical for successful execution of a deepwater subsea project.

With large proven deepwater reserves on East Coast of India and promising southern end of the west coast, L&T has taken a number of initiatives to cater to the local and regional market in terms of specialist services comprising engineering, fabrication, testing and installation services. The Company is building-up a core team leveraging on internal resources and induction of experienced personnel and assets. It constantly engages with some of the world's biggest firms active in the deep water exploration segment and is even working on a few projects currently.



*L&T has laid more than 600 km of subsea pipelines for domestic and international projects.*

# Re-engineering Urban Commute

## Badarpur-Faridabad Elevated Metro Rail Corridor



*The completed portion of Badarpur - Faridabad Elevated Metro Rail Corridor.*

**W**ork in the city, live in the suburbs – that’s the new reality of the aspiring Indian middle-class. With most of our big cities already bursting at the seams with people, those still wanting a piece of the city life have, in the recent years, taken to the suburbs. While this has allowed a great many to afford the advantages of an urban existence, the same trend however has cast a light on another challenge – the daily commute. Whether it’s Mumbai, Delhi, Bangalore or any of our busy metros, each receives an untold number of people who come

in to the city for work every day. These men and women often have to rely on multiple modes of transport (which it must be said aren’t always reliable) and spend hours shunting between their homes in the suburbs and offices in the big cities. The anxieties of long uncomfortable commute coupled with the pressures of the daily grind often leave these poor souls with very little time for anything else. There’s no social life after work, no quiet time for to be spent with family.

For too long the residents of suburban New Delhi along the Badarpur-Faridabad stretch have had to

accept this as an inescapable fact of life. Not anymore though. In a few months, thanks to the upcoming Badarpur - Faridabad elevated metro rail corridor, they will discover the pleasures of a fast, comfortable commute and receive that all too precious gift of time.

Under the aegis of Delhi Metro Rail Corporation (DMRC), the project is being executed by L&T Construction’s Heavy Civil Infrastructure IC which in a short span of time has successfully built a unique elevated corridor that’s sure to transform the concept of urban commute in the capital region. The second line to cross the Delhi-



*Viaduct under construction which uses the new precast technology: 'U' girder.*

Haryana border after the Yellow Line to Gurgaon, this extension will run fully elevated for 14.2 km with 9 stations along the route. L&T's scope for this fast-track project included the construction of the complete structure/guideway of the elevated viaduct between chainage 20.162 km and 33.924 km (approximately 12.5 km) for standard gauge twin metro rails, an 860 m viaduct to the depot and a 180 m ramp structure (retaining wall). During the course of execution, the scope was expanded further to construct seven station buildings at Sarai, NHPC Chowk, Mewala Maharajpur, Sector-28, Neelam Chowk Ajrona, Bata Chowk and YMCA Mujesar.

### 'U' Girders for Speedy Execution

To execute the viaduct within the contractual period of 20 months, DMRC proposed the use of a new precast

technology – the 'U' girder, which it had patented recently. The specialty of the 'U' girder over conventional arrangement was its length where two such girders made one segment of the viaduct. Having experimented with this design scheme in one of its earlier projects DMRC expected L&T to apply the novel technique on a mass scale and build the elevated corridor in this phase III of the project.

Varying in span lengths from 15 m to 27 m, the 'U' girders formed the crux of the project and needed to be delivered quickly and promptly to facilitate a seamless execution. A 10 day gestation was fixed by the team to produce the girders. Weighing close to 160 t, the girder is a tub-like structure that had to be cast at the yard and then moved along the line of the project for erection. The yard was equipped with a capacity to churn out 6 girders a day and topped the charts with an overall

peak productivity of 108 girders against a monthly target of 60 units.

Since the viaduct has 8 stations and an access line to the depot, conventional 'T' girders were erected for enabling the cross-over of rail lines. The shutter design was further improvised upon to reduce cycle time from 10 days to 7 thereby successfully meeting all the key milestones for the project.

### Precasting at a Playground

A playground, almost the size of a football field located centrally to the line of the viaduct was chosen as the spot for the site office as well as the main hub for the precast production. Five Goliath Cranes of 100 t capacity were procured and commissioned to do all the heavy lifting. State-of-the-art batching plants supplemented the concrete feed. The quantum of works included precasting of pier caps, 'U' and 'T' girders. Unlike

a factory line production, the precast elements at the yard had certain intricacies which needed accurate calculations. L&T's engineers had to zero in on the differences arising in the span length so as to accommodate inserts such as bolts, drainage chutes and earthing connections. Also, a secure methodology was used to stack the heavy frames at the yard in a phased manner by making the units rest one over the other on the casting bed. Besides, to prevent footfall while at work, small over bridges were erected at locations to facilitate easy access.

### Fitting Pier Caps to Perfection

Affixing the pier caps was a critical task, one that tested the skills of our engineers. Aligning the height of the piers was crucial to the whole process of precast element erection across the length of the viaduct. Knowing fully well that a slip would prove costly, L&T's engineers played it safe by adopting a trial-and-test method. Initially around 20 pier caps were cast-in-situ and when the vertical alignment was found to be stable, the coordinates were plotted and the pier caps were precast at the yard.

A strategy was evolved to manually freeze the height by implementing a simple yet practical piece of engineering by enlarging the pier cap by around 8 mm in height and then grinding it fine to match the alignment. This breakthrough propelled the work forward.

### Erecting Portal Beams at Night

At points where the viaduct swings across to the other side of the highway, the plan was to construct huge portal beams in cast-in-situ mode. Realising that the task would be time consuming and holding up key sections of the busy highway was impossible, the team innovated by converting the six portals to precast portals and the heavy beams were then transported from the casting



*Precast pier cap being removed from the moulds.*

yard to the construction site and erected in the middle of the night. This was the first time in the history of DMRC that portals measuring 15 m in length and weighing as heavy as 205-225 t were precast and erected. Two 500 t heavy lift cranes along with one 250 t trailer were pressed into service for the installation of the six portal beams on 12 piers at a height of 12 m. The other seemingly lighter beams were also precast and erected in the same manner across other locations.

### Ensuring Safety

A stringent safety and quality management system was put in place to ensure that the tasks were fast-tracked safely and precisely. Every project member was entrusted with the role of a process owner for ensuring safety and quality. Unsafe acts were reviewed and an undertaking was obtained from the concerned personnel that it would not be repeated. Regular inspection of key equipment such as gantries, batching plants and power tools was carried out as per EHS objectives. As the job involved a lot of working at heights, awareness and orientation programmes, involving the project team members and workmen on safety applications were held at regular

intervals. To increase know-how on safety equipment, an exclusive display was set up at site which was the first point of contact for new employees. Safety Committee Meetings further reviewed tasks to bring in an added oversight to any concerns.

Quality was assured to the client through the testing of all materials as per the inspection and testing plan. It involved submission to non-destructive tests that comprised rebound hammer and ultrasonic pulse velocity meter.

### Hard Work Pays Off

All this innovation and engineering allowed L&T to complete the viaduct before schedule and an impressed (and a much pleased) DMRC decided to expand the scope of the project by awarding L&T the contract for the construction of seven stations. While six of them are modest structures of two floors rising to a height of 13 m, one of the stations is a seven-storied structure with a basement, rising to a height of 37 m. Currently nearing completion, all the seven stations will be ready well in-time for when the new metro line opens up for the public in a few months.

# A Vibrant Presence at the Vibrant Gujarat G



Among the thirty-odd exhibitions that L&T participates in every year, Vibrant Gujarat occupies a niche of its own. And that's because it doesn't have a niche! Unlike say, a Chem Tech which is primarily aimed at chemical engineers or an Elecrama which caters to the electrical and electronic segment, Vibrant Gujarat is for anyone interested in Gujarat. And frankly, who isn't?

The wide open canvas that Vibrant Gujarat opened up, allowed L&T to communicate its message through three distinct channels. Channel A comprised panels which talked about L&T from the perspective of the ubiquitous common man. It showed how L&T contributed to a better quality of life in vital fields of infrastructure, defence, oil & gas, etc. Channel B turned the spotlight to the state where the exhibition was being hosted. Channel C was geared to grab eyeballs of a hard core technical audience. It provided highlights of our capabilities in each of our major businesses.

# Global Trade Show



L&T has been a part of the Gujarat success story much before the world witnessed the first iteration of the now famous “The Vibrant Gujarat Summit” and began using the word “Vibrant” as a prefix for the state’s name. With significant business interests spread all over the state, L&T has always championed the cause of Gujarat as one of the foremost business destinations in all of India and its continued presence at the marquee investor’s summit and the accompanying trade show is a proof of its steadfast support for the state’s economy.

Right from 2003 when the biennial event was first launched, L&T has been a permanent fixture at the event and this year was no exception either. At this year’s “Vibrant Gujarat Global Trade Show” held from January 07-13, 2015, in Gandhinagar, the Company erected a massive stall which showcased its competencies across various business segments and how L&T is partnering in not just Gujarat’s but India’s growth story.

Housed in the Corporate Pavilion, the L&T stall exhibited how the Company is building the India of the 21st century by addressing critical requirements in key sectors like Hydrocarbon, Infrastructure, Power, Defence and Process Industries. The stall showcased L&T’s Construction capabilities in building smart cities, dedicated freight corridors, power transmission & distribution, transportation and heavy civil

*Impressive stall at Vibrant Gujarat which highlighted the broad spectrum of product, service and capabilities of the company.*



infrastructure. Other parts of display area focused on L&T's manufacturing prowess in water & renewable energy, nuclear power, shipbuilding, defence equipment, electrical & automation, hydrocarbon engineering and power.

L&T's CSR efforts were also on display at the week-long exhibit. As one of the leading Indian corporates engaged in a variety CSR initiatives, the 'giving back' philosophy of L&T came through strongly at the event.

- There are two main components to Vibrant Gujarat – the Trade Show (where L&T participated) and the Global Summit (addressed by political leaders and industry head honchos, including Mr. A.M. Naik, Group Executive Chairman, L&T).
- Taking centre-stage in L&T's display at the Trade Show was none other than an artist's impression of the Statue of Unity.
- The speeches of global leaders resound across a magnificent auditorium built by L&T Construction.
- Presence of the Prime Minister at the Global Summit in the vicinity meant intensive security. But this did not dampen the enthusiasm of L&T's manning team.



*Glimpses of L&T stall.*

## Process Safety Core to Business Says Mr. K. Venkataramanan



*Process Safety must be built into management systems said Mr. Venkataramanan at the Global Summit.*

Organisations must treat process safety as a core value and ensure that it gets woven into the management systems if they hope to build a profitable and sustainable business exhorted L&T's CEO & MD, Mr. K. Venkataramanan, at a recently concluded two-day summit on Global Process Safety organised by the Centre for Chemical Process Safety (CCPS).

Held on December 15-16, 2014 in Mumbai, the event brought together 170+ senior process safety practitioners and subject matter experts from across the globe as they deliberated on ways and means for pushing the agenda on Process Safety across chemical, pharmaceutical, and petroleum industries.

The event had participants from a number of Indian and international oil & gas majors including Bahrain Petroleum Company, Emirates National Oil Company (ENOC), Reliance Industries Ltd, Cairn India

Ltd, Hindustan Petroleum Corporation Ltd, HMEL, EIL, Essar Oil Ltd, Deepak Fertilisers & Chemicals Corporation Ltd, and Paradeep Phosphates Ltd.

A novel feature of the event was the Leadership Forum, where Mr. K. Venkataramanan along with ten other industry leaders participated in a close-door meeting and shared his perspective on process safety and how best it can be implemented across an organisation. The outcome of the discussion was presented to the delegates in a plenary session announcing a call for action by Mr. Venkataramanan. Noting that profit, sustainability and reputation can be significantly impacted by safety, Mr. Venkataramanan insisted that it is the moral duty of the leadership to ensure employee safety.

With regards to the summit's objective of transforming AIChE-CCPS Project Vision 20/20 into result oriented actions for achieving process safety excellence, Mr. Venkataramanan

stressed that safety should be a core value and it must be built in to the management systems and competency must go from floor level to leadership and include practical training and assurance. Speaking further he added that rigour for contractor safety and interaction with them need improvement.

CCPS is a not-for-profit organization, within American Institute of Chemical Engineers (AIChE) that identifies and addresses process safety needs within the chemical, pharmaceutical, and petroleum industries. CCPS brings together manufacturers, government agencies, consultants, academia and insurers to lead the way in improving industrial process safety. The two-day Mumbai event coincided with the 30th anniversary of the Bhopal incident and hence the deliberations were focused on the great strides made in Process Safety and the way forward to enhance the same.

## KV Delivers Keynote Address at IMEA-2014



*Mr. Venkataramanan addressing the gathering at IMEA-2014 and at right, with one of the Indian Manufacturing Excellence Award winning teams.*

“There was a pride attached to working in the manufacturing sector but it got diluted over the years. With ‘Make in India’, there would be renewed interest in the sector. We see new investment in defence and railways. The new emphasis in these areas would start coming in within next 12 to 24 months,” said Mr. K. Venkataramanan, Chief Executive Officer & Managing

Director, L&T.

He was delivering the keynote address at the Indian Manufacturing Excellence Awards (IMEA): 2014 in Mumbai on December 12, 2014. He also noted that the industry will have to cope with land and labour reforms in the coming years but the renewed interest of the government in manufacturing sector will be good for the growth.

IMEA awards, given by The Economic Times and Frost & Sullivan, acknowledge the best facilities in India that have achieved and sustained manufacturing excellence. It was attended by stalwarts in the manufacturing industry from across the country.

## KV at Maharashtra Economic Summit



*The Chief Minister felicitates Mr. Venkataramanan at the Maharashtra Economic Summit.*

Despite the infrastructure boom of the early and mid-2000s, India currently has a large infrastructure deficit and there's

an urgent need for the government to take corrective measures to push the growth agenda forward. L&T's CEO &

MD, Mr. K. Venkataramanan believes that time has indeed come for the state to re-ignite the growth engines by lending the infrastructure sector the necessary support that it so desperately needs.

On January 16, 2015, speaking at the 3rd Maharashtra Economic Summit in Mumbai, Mr. Venkataramanan hoped that with the new government at the helm, the tide will soon turn in favour of infra players and the state will witness the kick-starting of yet another infrastructure movement. The summit organised with a view to exploring key development agendas for the new government across Infrastructure, Energy, Industries and SME sectors, witnessed a gathering of top business leaders and government officials including the newly appointed CM of Maharashtra, Mr. Devendra Fadnavis.

Emphasizing on the role of infrastructure sector in the overall development agenda, KV said that it is one of the core sectors of the economy and that Maharashtra stood on the cusp of a great infrastructure boom. "All it needed was the right push and the young and dynamic CM was just the man needed for the job," he said.

Skill Development is another

area that needed urgent government intervention according to KV. "With the advent of technology, key sectors such as manufacturing and construction have undergone a tremendous change in the recent years and currently there exists a tremendous crunch of skilled resources to adequately accommodate these changes," he noted.

The Chief Minister felicitated KV along with other dignitaries for participating in the event and sharing valuable insights.

The Maharashtra Economic Summit was organised by Maharashtra Industrial and Economic Development Association (MIEDA) and SME Chamber of India with the support of Government of Maharashtra.

## EWAC Stall Steals the Show at INDIA ESSEN WELDING & CUTTING 2014



EWAC Alloys Limited, a wholly owned subsidiary of L&T and market leader in maintenance and repair welding, generated quite the buzz at the recently concluded INDIA ESSEN WELDING & CUTTING 2014, country's foremost trade fair for joining, cutting and surfacing technology.

Held from October 28-30 in Mumbai, the fair was organised by India Essen Welding & Cutting and Messe Düsseldorf, witnessed participation from more than 140 exhibitors from 13 countries. The 6th edition of the biennial event presented EWAC with an opportunity to showcase its products and processes to Indian customers and extend its reach in the overseas market.

The EWAC stall at the fair featured, among other things, a live demo of Nano Technology based high temperature wear resistant alloy and display of impact resistance wear plate. Also on show was its Robotic Seam Tracking System for welding automation along with its new range of welding equipment.

The stall received more than 400 footfalls and more than 150 product enquiries during the three days of the fair. To attract more visitors to its stall, the EWAC team had also organised a lucky dip for new product promotion and an instant response system for the visitors.



## LTHE Bags IT Award for Project PACE



*LTHE Team with the SAP Ace Award.*

On November 12, 2014, at the annual SAP ACE Awards held in Mumbai, L&T Hydrocarbon Engineering was honoured with a special award for

successfully implementing Project PACE - eSourcing Portal (ARIBA) across LTHE.

LTHE received the award in the category "Special Recognition for Procurement Solution for Project Based Organisation". Mr. Ravi Chauhan, Managing Director, SAP India, presented LTHE with the award at a gathering of high-ranking business executives and technology professionals from various industries.

The award from SAP is a second for LTHE which in 2010 had won SAP ACE Award for Customer Excellence for Best Run Award in Engineering, Construction & Operations (ECO) for a neat IT implementation in a fabrication facility that supported ECO customer needs.

## Mr. Dharmendra Pradhan Visits L&T Built RR Plant



*Mr. Dharmendra Pradhan being escorted to the RR section site.*

On November 16, 2014, Mr. Dharmendra Pradhan, Minister of State (Independent Charge), Petroleum & Natural Gas, Govt. of India, visited L&T's 4.17 MMTPA FCC - Reactor Regenerator Plant in Paradip, Odisha as part of his trip to the seaport town which he was visiting to lay the foundation stone

of a Polypropylene Plant at IOCL's 15 MMTPA Grassroot Refinery and planned Petrochemical Complex.

Accompanied by his entourage, the minister was greeted by the dignitaries of Indian Oil Corporation Limited and L&T in the plant area. L&T's Project Manager, Mr. Ashis Majumdar welcomed the minister and briefed him about the plant and its operations. He was escorted to the top of the Reactor Structure where he could get a bird's eye view of the entire refinery complex. The Minister, during his brief stopover, also interacted with the workmen at the site and appreciated their contribution in erecting the facility.

The Plant, mechanically complete, is currently waiting for utilities to start pre-commissioning activities. It has some of the largest-sized equipment and refractory lined pipes in all of L&T's history.

## L&T Infotech Launches BEST Initiative



*Mr. Kakal explaining the key themes of the BEST initiative.*

On November 21, 2014, Mr. Chandrashekar Kakal, Chief Operating Officer, L&T Infotech, launched BEST (Business Excellence for Sustainable Tomorrow) Programme at the company's Powai Centre (Technology Tower) in Mumbai.

The programme, aimed at improving result parameters such as Client Satisfaction, Revenue Growth, Profitability and Employee Satisfaction,

encompasses 9 key initiatives.

Commenting on the launch, Mr. Kakal said, "The objective of this programme is to integrate and synergize our initiatives to become better than a best-in-class organisation and build a strong foundation in becoming an IPO-ready organisation."

He also underlined the importance of a governance team and emphasised that its activities should be followed

by the team for making the BEST programme a success.

Speaking on the occasion, Mr. Rajesh Gharpure, Practice Head, Consulting & Thought Partnership, and the initiative owner of "Sharing Vision, Mission & Strategy", shared insights on the Inside-out and Outside-in analysis done through workshops, e-collaborations, industry analysis and experience. As the initiative owner for "Delivery Solutions & Innovation Excellence", Mr. Kamlakar Tendolkar, Executive Vice President, Insurance BU (Business Unit), stressed on improving service delivery and employee satisfaction and employee participation across all cadres and centers.

Mr. Sudhir Sheno, Head, CPG, Retail & Pharma BU, and the initiative owner for "Process & System Excellence", explained the R-cube framework which consists of Right Data, Right Level of Excellence and Right Time and how it can lead to improved results.

In addition to the L&T Infotech's leadership team, a number of senior executives and delivery heads attended the launch event.

## British Safety Council's Sword of Honour for MFY Sohar

In recognition of its efforts to ensure the highest level of health and safety standards, L&T Modular Fabrication Yard LLC, Sohar, Oman, has been awarded the prestigious Sword of Honour Award from British Safety Council (BSC) for the year 2014.

The award, representing the pinnacle of achievement in the world of health and safety management was presented to L&T MFY Chief Executive, Mr. C. S. Kole, on November 28, 2014, during a luncheon at the Goldsmiths' Hall in London. Mr. Kole was handed a sword trophy and a certificate by British Safety

Council Chief Executive, Mr. Alex Botha. Aimed at recognising excellence in health and safety management, the 2014 Sword of Honour was open to all organisations that achieved a Five Star rating in its Five Star Occupational Health and Safety Audit between 1 August 2013 and 31 July 2014.

*Mr. C. S. Kole receiving the sword trophy from BSC Chief Executive, Mr. Alex Botha.*



## Splendid Show by L&T at IMME 2014



*L&T's massive two-tier stall with giant machines on display at IMME 2014.*

L&T Construction & Mining Machinery with its principals Komatsu-Japan and Scania-Sweden put up a splendid show at the 12th International Mining & Machinery Exhibition (IMME 2014) held at Salt Lake Grounds, Kolkata from 3-6 December 2014. In what was a telling show of L&T's strong product portfolio and cutting edge technological prowess, the mammoth Komatsu WA900 Wheel Loader (which has already seen many successful deployments in the Indian iron ore industry) was put on display for the first time at an exhibition. The Komatsu HD785 Rear Dump Truck and Scania P410 Tipper Trucks (with coal and rock body) also formed a part of the impressive equipment display. L&T also had on show its indigenously developed L&T 9020 Wheel Loader – which finds multiple applications in the construction and mining industry – at the exhibit.

L&T's massive two-tier stall with its large conference halls and meeting rooms and pitch-perfect branding

was the cynosure of all eyes. The aesthetically designed spaces attracted visitors and provided plenty of room for the customers to interact with the marketing teams. A dedicated theatre room which played films related to machine maintenance provided an added attraction to the visitors. Besides, a separate area was earmarked for displaying genuine spares from Komatsu and Scania and customers gained a first-hand understanding of the advantages of using genuine filters over non-genuine ones with the help of bubble test display set up at the stall. The stall had also on display re-con engines and other components which were repaired at its Service Centres.

Modular Mining Systems (I) Pvt. Ltd. - a Komatsu company - participated in IMME 2014 with its offerings on mine management solutions. L&T Hydraulics also joined the show with a display of Wheel Dolly, deployed in the mining equipment industry. L&T MMH too displayed its capabilities in bulk

material handling systems at the event.

Mr. S.R. Subramanian, Executive Vice-President & Head, Machinery SBG, along with Mr. Arvind K. Garg, Vice-President, Construction & Mining Machinery Business, Mr. Partha Mookherjee, Head-Mining Equipment Business, Mr. Hemant Mathur, Head - Construction Equipment Business and Mr. Rahul Mehta, Head-Tipper Trucks Business, led the company's participation at IMME 2014. Mr. J.P. Nayak, Former Member of the Board, L&T, visited the stall as did Mr. K. Mizuhara, Managing Director, Komatsu India Pvt. Ltd. along with his management team.

Several customers from the coal and mining industry and principal officials from the Ministries of Coal, Steel and Mining, Government of India visited the stall and interacted with the senior management and several machine key handing over ceremonies were witnessed during the course of the four-day event.

## L&T-Chiyoda Bags Top Prize for Engineering Consultancy



*Mr. Jitesh Sheth receiving the CEAI National Award from Mr. O.P. Goel and Mr. A.P. Mull.*

Consulting Engineers Association of India (CEAI), the apex body of Consulting Engineers in the country has bestowed 1st Prize on L&T-Chiyoda (LTC) in the Excellence in Engineering Consultancy Services category for 2013 for Detail Engineering Services for Mangalore Aromatics Project.

The award was presented to LTC at India International Centre, New Delhi on November 28, 2014 where Mr. Jitesh A. Sheth (Head-Project Engineering) and Mr. Mukesh Vaswani (Head-Quality) from LTC, received the award from Mr. O.P. Goel, Director General, CPWD (Retd.) & Past President,

Institution of Engineers and Mr. A. P. Mull President, CEAI.

The project for which LTC received the award had the largest quantum of work volumes in Civil, Structural, Equipment, Piping, Electrical and Instrumentation, handled by LTC till date. During the execution, various best practices from the field of project management were implemented.

These included: implementation of construction focused engineering schedules; human resource management between various centres of excellence; robust risk and change management processes; global sourcing and logistics management; integrated E, P & C planning workshops; and quality management processes.

The project in many ways is a strong reaffirmation of LTC's credentials in the domestic and international markets for executing engineering for large value and complex refinery and petrochemical projects in excess of the value of USD 500 million & more.

## LTV Felicitated by Bentley Systems for OSX-3 FPSO Project

L&T-Valdel (LTV) stood in the top 3 at the prestigious "Be-Inspired Awards" competition, recognising outstanding achievements in infrastructure design, construction and operation, organised by Bentley Systems from October 28-31 in London, UK. The event was part of the 'Year in Infrastructure 2013' Conference, a gathering of leading professionals and business executives from the world of infrastructure design, construction and operations.

LTV had submitted details of its experience in the structural engineering of OSX-3 FPSO project in the "Innovation in Offshore Engineering category" and its efforts had found special mention in the keynotes of Greg Bentley, CEO and Malcolm Walter,

COO, of Bentley Systems during the event.

LTV was once again felicitated by Bentley at the "Bentley Advantage Seminar" held in Mumbai recently. During the seminar, LTV showcased how it uses Bentley software (SACS, STAAD-Pro) to optimise its design and achieve breakthroughs in FPSO module design.

OSX-3 FPSO is located in the Santos Basin, off the coast of Brazil. It is turret-moored in a maximum water depth of 110m and is designed to produce and treat roughly 100000 barrel of crude oil per day. The challenge was to complete the topside design of 15 modules and 10 pipe racks within a record time of 10 months.



*LTV representative receiving the award from Mr. Malcolm Walter (left), COO Bentley Systems.*

## L&T AC Drive Series 'x2000' Formally Launched



On December 26, 2014, L&T Electrical & Automation (E&A) formally launched L&T AC Drive Series 'x2000' at a function held at L&T's Powai Campus in Mumbai. The event commenced with the customary lamp lighting and L&T Anthem.

This was followed by unveiling of five models of the 'x2000' AC Drives series by Mr. S.C. Bhargava - Senior Vice President & Head of E&A, Mr. P.K. Bajaj

- Executive Vice President & Head of Products SBG, Mr. R.K. Malhotra - Vice President & Head of Projects SBG, Mr. V.K. Arora - General Manager, Strategic Initiatives and Mr. Girish Tiwari - General Manager & Head of ESP.

Mr. Bhargava said it was a momentous day, which took him back to 1984, when L&T started working on two mega projects - Slip power recovery systems from Jeumont-Schneider and

PLCs from Yaskawa. He recommended taking advantage of the learnings of the last 20 years as far as the applications were concerned, especially since so many employees had painstakingly built up the expertise across E&A. "I am glad that today we are looking forward to our establishing L&T brand of drives in all the applications. I am sure with concerted support, we will make L&T drives a name to reckon with".

## LTHE Releases Sustainability Report – 2014

L&T Hydrocarbon Engineering (LTHE), at its Board Meeting on January 22, 2015 in Mumbai, released the Company's Sustainability Report at the hands of Dr. A.K. Balyan & Mr. Sarthak Behuria, Independent Directors on LTHE Board, in the presence of Mr. K. Venkataramanan, CEO & Managing Director, L&T, and the other Board Members.

The cover page of the 2014 report features the theme "In Tune, Attune". In line with the theme, LTHE with the core values & strength of L&T, attunes itself to the emerging realities with a more sustainable framework.



*Dr. A.K. Balyan (left) and Mr. Sarthak Behuria (right) releasing the Sustainability Report. Mr. Jeewan Mahadik, Head-LTHE Sustainability Team, is in the middle.*

## CMRL Elevated Package Receives Award

L&T's Chennai Metro elevated package project has bagged the prestigious 'Excellence in Mega Infrastructure Works' for the year 2014 for both its project packages. The award was presented by His Excellency, Governor of Tamil Nadu, Mr. K. Rosaiah and was

received by Mr. S.V. Desai, Vice President & Head – Metros & Defence BU, L&T, on January 24, 2015, at Royapettah, Chennai.

Recommended for the award by the client, CMRL, the elevated packages include marvellous construction

achievements such as construction of Rail Over Bridge at Guindy, Balanced Cantilever viaduct across Kathipara flyover, and two level station viaducts at Alandur.

## LTMRHL Scores a Hat-trick at PRSI National Awards 2014

A glittering award ceremony at this year's All India Public Relations National Conference in Jaipur on December 19, 2014, saw L&T Metro Rail (Hyderabad) Ltd (LTMRHL) win three awards across as many communication categories – making it a remarkably successful night for LTMRHL's communications team.

Conducted by Public Relations Society of India (PRSI), the annual conference's theme this year was inclusive growth. The three-day event titled "Marching Together: Role of Public Relations" witnessed 42 PRSI Chapter from all over India take part in it. The dignitaries who

graced the awards ceremony included Mr. Madabushi Sridhar, Central Information Commissioner; Mr. R.V. Chandravadan, IAS, Commissioner of Information & PR, Govt. of Telangana; Mr. A.M. Singh, IAS, Joint Secretary, Ministry of NE Region, GoI; and Mr. Malladi Krishnanand, Press Secretary to Governor – Andhra Pradesh & Telangana.

The three categories in which LTMRHL won the award were: Social Media for PR & Branding; PR in action – HMR Brand Ambassador Campaign; and Best Public Awareness Programme (Overall activities). These awards were given by Mr. Kailash Meghwal,

Speaker of Rajasthan, and Dr. Gulab Kothari, Chief Editor, Rajasthan Patrika Group, to LTMRHL's Corporate Communications Team.

The Jury for PRSI National Awards included Mr. Wajahat Habibullah, Former Chairperson National Commission for Minorities and former Chief Information Commissioner; Mr. S.K. Chaturvedi, Chairman, Joint Electricity Regulatory Commission (State of Goa and Union Territories); Mr. Madabushi Sridhar, Central Information Commissioner; Mr. Sarthak Behuria, Group President, Modi Enterprises; Dr. Ajit Pathak, National president, PRSI.



*Mr. Sanjay Kapoor, GM-Corporate Communications, LTMRHL, receiving the award for HMR Brand Ambassador Campaign from Mr. Kailash Meghwal & Dr. Gulab Kothari.*



*Ms. Geeta Mallikarjunan & Mr. Sanjay Kapoor receiving the award for Best Public Awareness Programme.*



*Mr. G. Narendranath receiving the award for Social Media for PR & Branding.*

# Engineering a Marvel

L&T-Valdel Engineering Limited, the engineering arm of L&T Hydrocarbon Engineering, carried out Detail Engineering, 3D Modelling, Procurement Support and Engineering

Project Management for this Floating Production Storage Offloading (FPSO) OSX 3 to be deployed in the Brazilian Campos Basin. This FPSO is designed to receive well fluid from two fixed

platforms, has an estimated capacity of 100,000 bpd and stores 1.3 million barrels of oil. Client: MODEC and Toyo Offshore Production Systems (MTOPS), Singapore.

