

HELMET

 Environment  Health  Safety

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KEEPING SAFE |
DURING COVID TIMES |



Rahul Sikka
Head – PT&D, Africa

As one of the world's oldest and largest EPC companies, L&T has maintained the culture of zero harm during site operations across Africa. As a result, we have reported zero fatalities for the last five years, zero Lost Time Injuries (LTI) for the current financial year, zero major environmental incidents for the last five years and zero environment legal contravention. Our efforts have been well recognized by external safety institutes including five of our projects that have won various international awards.

Based on our experience over the years at international projects, the project management team needs to pay close attention to safety management as it is one of the most important aspects of project execution. International project sites are necessarily operating in a social, economic, and physical environment that is quite different from those to which we are accustomed to at home.

To add to this, at a typical international L&T project site, one finds employees from several countries working together. They are quite different from each other in many aspects including their work ethic and culture. Our success lies in effectively bringing together employees of different nationalities

Foreword

Safety at international L&T project sites

under one umbrella, embracing the well-established L&T safety culture, and ensuring the continuous adoption of our safety best practices.

The safety practices and problems encountered at international construction sites are as wide-ranging as the various geographies themselves. All construction sites have their own unique aspects of safety which must be considered. L&T has a globally renowned reputation to uphold, as well as a unique and proud safety record to maintain. We are also well prepared to manage the safety aspects of the project. As the main contractor of a project, we are responsible for the safety of the whole project including the subcontractors' part. However, the subcontractors we employ may

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not have enough experience and knowledge to ensure their own safety.

As part of our preparation prior to commencing work, we must acquire a clear understanding of the subcontractors' safety procedures, rather than to assume that the subcontractor is implementing a safety programme of their own. The responsibility of safety cannot be left to the individual subcontractors and as the main contractor, we should take an active part in ensuring that the subcontractor is exercising all measures necessary to provide a safe working environment.

We must moderate our expectations however and understand that a construction company's emphasis on safety is often proportionate to its size. As an example, smaller companies may not place as high a priority on safety as larger companies. While there are smaller firms with excellent safety programmes and records, it is nonetheless a difficult process for them because of the expense incurred in implementing such a programme. Safety training is often left to on-the-job learning, and implementation of their safety management programmes is usually left to the site foreman or project supervisor. Consequently, and because of the unrelenting pressures of their normal workload, the method employed by them often meets only the minimum requirements at best, while most fail even to do that.

Our success lies in effectively bringing together employees of different nationalities under one umbrella, embracing the well-established L&T safety culture, and ensuring the continuous adoption of our safety best practices.

Some suggestions for our project teams to improve safety at our international project sites are listed below:

- Produce a site-specific safety policy document that includes terms and conditions, procedures, guidance notes and L&T safety SOP, also incorporating client requirements if necessary. This should be included in the contract documents for the subcontractors.
- Nominate members and set up the site organization for management of health and safety. Safety must be led from the front by the project management team, not left to the safety crew alone.
- Ensure that subcontractors are briefed about anticipated construction methods, site/design factors, relevant hazards, precautions, general site safety rules and conditions, and are clear about divisions of responsibility.
- Ask the subcontractors to inform us, and interfacing subcontractors, about possible hazards arising from their own activities.
- Ensure that subcontractors have made plans to work safely, have priced their bids accordingly and have the necessary resources.
- Ensure that subcontractors produce detailed method statements for high risk activities, and that we monitor the subcontractor's performance against the method statements, acting where necessary. It is a good practice to consider safety as the first item on the agenda of the regular subcontractor progress meetings.
- Manage health and safety on site by coordinating activities with subcontractors, ensuring that planned procedures are implemented and performance monitored so that revised arrangements can be made, as necessary.
- Carry out inter-inspections among subcontractors in turn. Each subcontractor has the chance of being the inspector of safety along with our safety staff.

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Size and safety matter even for a tiny island nation

L&T is constructing the largest transport infrastructure project in the island of Mauritius. October 9th, 2019 was a red-lettered day for the Mauritius Metro team when 12 km that constituted Phase 1 of this state-of-the-art light rail transit (LRT) project was inaugurated by the Prime Ministers of India and Mauritius. Suddenly, the Mauritians have realized the value of this new form of quick, clean, green commute to escape from their ever-growing, dense traffic, and how an improved public transport system can reduce harmful emissions

and drive economic opportunities for the country. The responsibility on Project Director, G Vinod, and his team, especially Safety In-charge, R Palanikumar is to deliver the project in time, to quality and safety.

The deadline to complete Phase 1 within a stringent timeline of 2 years that included not just track works but construction of the depot and other infrastructure such as a control centre, a substation and the like was a tough enough proposition to complete without compromising on safety.

“Phase 1 was also tough because we were on a steep learning curve,” remarks Vinod, setting context to the progress of the project. “We had to first understand the local conditions, the work culture, the unpredictable weather with frequent torrential rains and cyclones, the uncharted utilities, narrow roads, availability of materials, equipment & manpower.” His list is long, but he hastens to add, “our understanding is certainly standing us in good stead in our construction of Phase 2 that is on in full swing.”



A majestic view of the flyover above the M1 Road, one of the busiest motorways in Mauritius



Work in full swing on the riverbed



G Vinod
Project Director

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Facing the threat of working next to ‘live’ traffic

When building the LRT, one of the most critical challenges for Palanikumar and his team has been to ensure the safety of the workforce and the public while work proceeds next to ‘live’ traffic. A particularly critical activity, he points out, was the construction of a flyover above one of the busiest motorways on the island. “The M1 Road was a 6-lane divided carriageway with a speed limit of 110 kmph!” He pauses, perhaps recalling the multiple control measures that they put in place to ensure that they completed that stretch without any incident. “We provided a double-layer safety catch net, resorted to

lane closures, temporary traffic diversions, speed restrictions, power shutdowns to be protected from the overhead HT electrical line and much more.”

Building a new bridge next to a heritage one

The construction of the River Bridge on the GRNW (Grand River North West) was another critical activity. Apart from having to construct the bridge over the island’s main river to the catchment area in the north and west, the more critical consideration for the team was to construct this new bridge without harming an old, historic railway bridge next to it. “The 249 M long new bridge we were constructing was a mere 6.5 M away from the old one,” shares Palanikumar. The old bridge with stone piers had been in operation till the mid-60s, after which it was abandoned when the island’s rail network was removed. “It was a heritage structure and we had to be extra careful that our piling did not in anyway harm it.”



G P Sujith. “Since our Phase 2 was in full swing, we had advance planned our materials requirement and importation. Shipping time for new orders could be anywhere from 30 to 60 days but we are fine.”

Mauritius has an old utility network especially for water supply (managed by the Central Water Authority) and wastewater discharge (managed by the Wastewater Management Authority) that are not mapped. The team has had to contend with electricity and multiple telecom service provider lines in and around the project corridor. “The onus of tracking these uncharted utilities and relocating several of them was our additional responsibility,” says Vinod. “Yes,” he nods, “there have been some incidents of utility damage especially in the water supply and sewer pipelines but those were proactively managed by the utility service provider and contractor’s teams.”

“Our regular EHS reviews by management has helped to continually improve our EHS performance,” shares Palanikumar in conclusion. “The client’s regular joint site visits and EHS reviews have helped but what is best is that the management is very committed to project leadership and safety. We have good planning, adequate resource allocation, and robust risk assessments and with our teamwork, stakeholder support and proper planning, we should be able to deliver the project on schedule.” Palanikumar’s optimism is encouraging.

A due recognition of Palanikumar and his team’s effort to maintain safety at the Mauritius Metro project site has been a RoSPA Gold Award. Well done! ■



G P Sujith
Planning Manager

Luckily, our pre-planning was spot on and we had sufficient stock of major materials and tools. Since our Phase 2 was in full swing, we had advance planned our materials requirement and importation.



There were more challenges in store for the team: constructing the 24 M tall pier, building the approach to the riverbed, and working on a riverbed had its own issues of flash floods and high velocity of water flow because of the gradient. “Girder launchers were not available

on the island nor were they allowed, so we had to erect the girder with a crane from the flood plain,” ticking off yet another challenge but despite them all, Palanikumar smiles, “we were able to face and overcome all these challenges with proper planning, dedication and collaborative effort.”

Addressing more issues of men and material

Coordinating with the local workmen and subcontractors and synchronizing their pace of work with the foreign workforce was tough, more so because most of the locals only spoke the native, Creole. “We filled this gap by inducting locally graduated safety

professionals into the EHS team who were closely monitored by our field staff,” says Palanikumar, again ready with a solution for an issue. Keeping the workforce safe in the face of COVID-19 has been top priority for Palanikumar and his team ever since the 57-day national confinement was lifted. “A ‘Back to Work Procedures & Guidelines’ document has been shared with all detailing the measures to be strictly adhered to by employees, workmen, subcontractors and other external stakeholders and we are doing well so far.”

Being a sea-locked island nation, Mauritius depends heavily on imports including cost-effective



R Palanikumar
Safety In-charge

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heavy construction machinery. Fulfilling the project’s requirements for material was a massive task that was managed by advance material procurement planning in relation to the project requirements and progress. In fact, sitting in the middle

of the Indian Ocean, the pandemic induced disruption of supply chains could have been a huge deterrent for the project. “Luckily, our pre-planning was spot on and we had sufficient stock of major materials and tools,” smiles Planning Manager,

Strategies to keep safe across geographies



A community focus session in progress

For the last four decades, the Power Transmission & Distribution IC has established itself as one of the foremost EPC players in the Middle East by prioritizing stakeholder concerns and winning their trust. An approach that is holding the IC in good stead across other geographies too.

Driving a community focused approach

While community welfare has been an imperative for L&T projects, the management of community grievances has assumed more seriousness in recent times especially at international

projects. PT&D has quickly addressed such concerns by creating a well-defined framework, fully aligned with the International Finance Corporation at the 300 MWac Jeddah Solar Power Project, in the Kingdom of Saudi Arabia to efficiently receive, register, track, resolve, and close out complaints. "A key feature of the community focus process is to maintain consistent communication with the complainants through various modes such as SMSes, emails, calls, etc.," highlights Project Director, Abdul Hanif Khan, who is confident that once streamlined, the initiative can be rolled out across projects.

At the Chimuara - Nacala transmission line project in Mozambique, Senior Construction Manager, Debasis Ghosh and team had the onus of making the locals aware of the safety precautions to be taken as works began. "The high voltage line is aligned to pass through villages where people are predominately engaged in activities such as setting animal traps for hunting, tapping honey from bee combs that were exposing our surveyors to hazards. To prevent any untoward incident, we gathered together the community leaders in Sede de Nipiode and conducted a toolbox talk requesting them to remove their animal traps and beehives

Closing the gaps

"The safety scheme for working at heights is fundamental and going by the rule book, PT&D international projects have a simple but secure method to protect operatives," mentions EHSO, Ranjuraj Radhakrishnan Nair, ME-UAE-SS-132 kV Substation. "The risk of fall increases when site operatives fail to perceive the hazard, as in the case of openings in substation floors, many of which are large enough for them to fall through," he points out.

It is now mandatory that all openings with dimensions larger than 300 mm by 300 mm to have secondary protection from below of 19 mm thick plywood held in place by means of adjustable props. Safety during installation and removal



Debasis Ghosh
Senior Construction Manager,
Chimuara - Nacala
Transmission Line Project

By involving the local communities, we sent out a strong message that we care for them and that infrastructure development is to transform their lives.



of floor protection is ensured by a work permit requiring measures like suitable positioning devices, evacuation, demarcation, and signposting of areas.

Every drop matters

To prevent soil contamination due to fuel spillage, Gaurav Gaur, Project Manager, 132/11 kV Substation, Qatar,



Abdul Hanif Khan
Project Director,
300 MWac Jeddah Solar
Power Project

A key feature of the community focus process is to maintain consistent communication with the complainants through various modes.



with appropriate compensation. By involving the communities, we sent out a strong message that we care for them and that infrastructure development is to transform their lives."





Secondary containment for prevention of fuel spillage



Refueling apron

and team have adopted a secure containment approach to strengthen the bund and the integrity of wall sand seal pipeline and cable penetration. "The client was delighted with our initiative," his delight is obvious. "Today, this secure approach is being implemented across all projects while at sites without space constraints, a refueling apron has been suggested."

Staying cool under pressure

Heatwaves severely impact work and can result in serious or even life-threatening illnesses if exposed to open environment for an extended period. However, thanks to years of expertise, PT&D has evolved a Heat Stress Management Plan which



Misting fan installed at shading sheds

Eye wash stations are ideal for construction sites in remote locations that do not have a water source or ready access to healthcare facilities.

Kiran Devan
Construction Manager,
132/11kV Khalifa
Substation

continuously monitors the Heat Stress Index/Thermal Work Limit and adjusts the work/break timings. At the 400/132 kV RACECORS substation project, the resting shed is fitted with portable misting fans that prove particularly useful at remote sites having mobile work fronts and no access to airconditioned rest areas. "However, before this initiative is

Looking to stay safe

Some interesting work site improvisations by project teams include the establishment of portable, easily installable, self-contained eye wash stations that do not require plumbing. "They are ideal for construction sites in remote locations that do not have a water source or ready access to healthcare facilities," shares, Construction Manager, Kiran Devan, 132/11kV Khalifa Substation. The eyewash flow is a gravity activated mobile station aligned to ANSI Z358.1 standard and can deliver over 5 gallons per minute for 15 minutes. These stations are currently available in the UAE and will subsequently be implemented at other sites in the Middle East.

rolled out to other sites, it is being tested to determine its efficiency in humid conditions typical to the Middle East," mentions EHSO, Bilal Yasin.

Biosafety certification

COVID-19 has taught us how important it is to ensure a safe business and project environment towards which PT&D has initiated the certification of a biodiversity management system, pursuant to the requirements of the Biosafety Management System Standard developed by Bureau Veritas. This exercise will greatly benefit projects as the scheme will align to a management systems approach, to holistically manage the risk of infectious disease outbreaks most optimally.



Eye wash stations



Hemananda Chowdary
Planning Manager,
Lethlakane to Mawana
Transmission Line Project

With the ever-present threat of wild animals at the ongoing transmission line projects in Botswana, game wardens have been roped in for extra vigil and to accompany construction teams in specific areas where wildlife activity is more. Routes are inspected with drones wherever accessibility is a challenge.



Flying safe with drones

Across the ASEAN region, PT&D is making extensive use of drone technology for a range of survey and tower integration applications. At the Medamit to Lawas Town 275 kV transmission line project, drones monitor the entire transmission corridor. "In normal conditions, this would have been impossible," says EHS In-charge, Choo Siaw Ju, "but thanks to technology, our team members across work fronts are now in sync." Any safety noncompliance is immediately communicated for rectification and with some lead time gained, the core team is able to address any unlikely challenges that emerge. The good work has drawn appreciation with a silver rating for EIA compliance from the client, Sarawak Energy Berhad.

Ensuring communication at heights

Site in-charge, Anandamoy Mandal at the Matang substation project communicates with his crew through Bluetooth. "Earlier, we used to have walkie talkies which is still so at remote locations but largely the process of keeping the gangs informed on ground developments while at heights has



Monitoring of site locations through drone



Tower erection team equipped with Bluetooth wireless communications

changed radically," he highlights. "Of course, there are challenges as most of the transmission and distribution projects are long span but for now, at this site, we are managing communicating at heights."

Keeping safe from wild threats

L&T-ites excel in teamwork and at remote locations, this is critical especially when the alignment is close to a forest. "Workmen gangs are told to move only in groups to face and overcome the threat of wild animals while EHS coordinates have dedicated people to keep vigil and prompt alerts," mentions Hemananda Chowdary, Planning Manager, Lethlakane to Mawana transmission line project. "With the ever-present threat of wild animals at the ongoing transmission



V Ramanathan
Head - EHS, PT&D IC

Our unique SOPs to safely execute every task along with digitalization, an in-depth appreciation of the risks involved, and our safety measures have given us a decisive edge.



line projects in Botswana, game wardens have been roped in for extra vigil and to accompany construction teams in specific areas where wildlife activity is more. Routes are inspected with drones wherever accessibility is a challenge. Local EHS professionals with comprehensive insights about their country have been brought on board to assist teams to implement and enforce legislative requirements."

To protect employees from snake bites, solar snake repellents have been installed around storage areas and those clearing bushes are equipped with these tools too.

Consistently raising the bar

The once-fledgling Africa BU has established itself as a force to reckon with in 10 countries across the North, East and South of the continent with a vision zero record while the ASEAN and Middle East regions have gained their clients' trust with safe project deliverables. "Our unique SOPs to safely execute every task along with digitalization, an in-depth appreciation of the risks involved, and our safety measures have given us a decisive edge," sums up V. Ramanathan, Head- EHS. ■



TBM shield being lifted at Mumbai Metro Package 03 UG 01

Getting TBMs up and digging!

With the rising demand for underground infrastructure primarily due to space constraints, the role of TBMs or Tunnel Boring Machines are assuming greater relevance to excavate tunnels, across various types of soil strata. Since India does not presently manufacture TBMs, all those presently in use are imported. Of late, L&T has been employing several TBMs across project sites having launched a few recently at the metro rail projects in Mumbai, Bengaluru, and Ahmedabad, in several cases without much help from the OEMs.

At the Mumbai Coastal Road Project (MCRP), Sandeep Singh, Project

Director of Package 4 has an 80 M long TBM with a 12.19 M diameter, weighing 2,300 T with an installed capacity of 7,280 kW to assemble. "It is the largest in the country," he says seriously, "specially procured to excavate in deep overburden through a compound stratum of basalt, breccia and shale for which it is equipped with a mixed cutter head with eight spokes and eight panels to bore in the complicated strata for a long distance." Assembling such a complex piece of equipment is Sandeep's biggest challenge.

Certainly, the process of assembling, launching, and putting a TBM to work calls for knowledge, precision, and

high safety standards, recognizing which L&T's Tunnelling Excellence Academy is training and preparing tunnelling experts.

Safely transporting a TBM to site

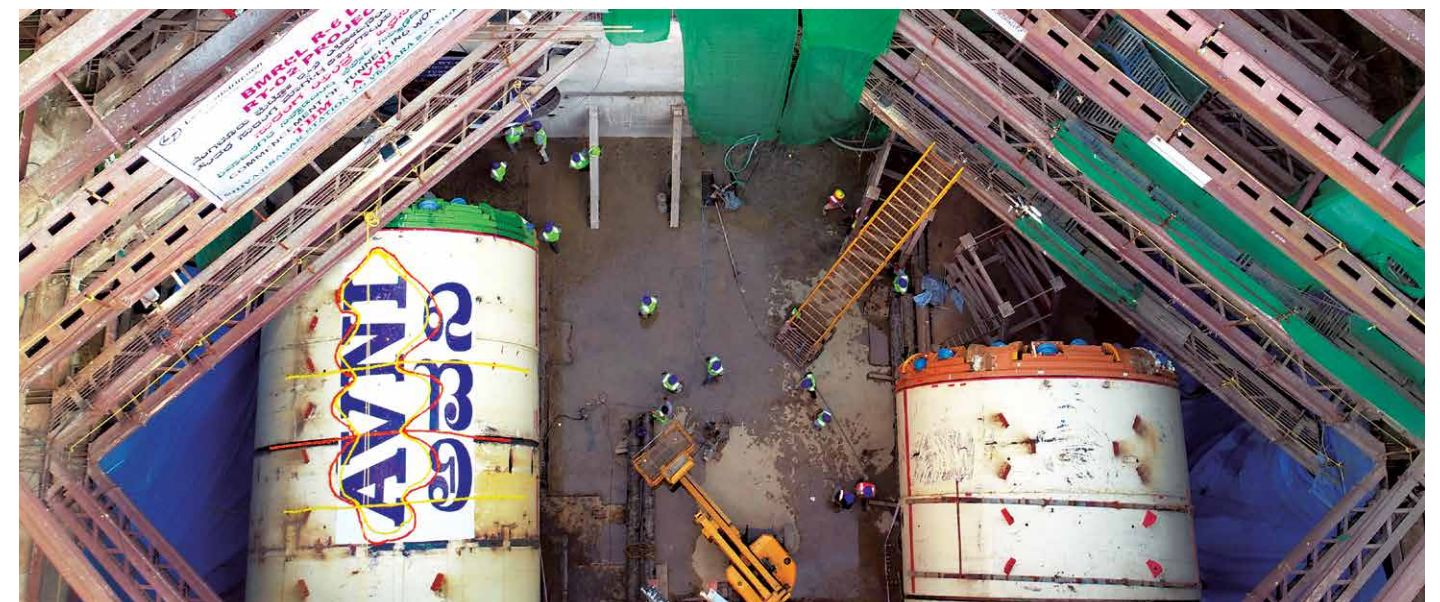
Launching any TBM takes weeks of planning and preparation but the mandatory first step is for the OEM to confirm that the TBM has successfully undergone a Factory Acceptance Test (FAT) before shipping it. "This is where the fun starts," grins Michael William Sanderson, Head - EHS, Heavy Civil IC. "Once the TBM arrives in India, it has to be safely transported to the project site and our safety obligations begin as soon as the TBM is off loaded onto a trailer." The MCRP TBM when dismantled filled as many as 17 trailer trucks. Right from leaving the dock yard, the EHS team must be on their toes. Transporting the TBM in urban environments is particularly strenuous: carrying the cutter head (with varying

diameters), the shield and supporting gantries which were assembled at the factory and then disassembled for transporting.

En route, the risks are enormous for the trucks and their escorts are regularly checked and verified at various check posts. "We must consider the emergency vehicles accompanying the TBM, notify the police and fire brigade about our routes and timing but public safety is paramount," Michael emphasizes.

Safely building it at site

Once safely unloaded at site, the team must put their minds and muscle to building the TBM. The sequence is crucial, and the shaft determines the order of reassembly. Some L&T projects have vertical shafts that only allow the shield to be lowered followed by the cutter head by cranes, carefully chosen considering their lifting capacity



TBM 1 (AVNI) commissioned and TBM 2 (LAVI) assembling in progress



TBM 1 (AVNI) auxillary shield tandem lifting & lowering in progress



Every day brings new activities and fresh challenges.

G Divakar
EHS Compliance Head,
HCL IC



and capability to lower all the TBM components above the shaft. “The Mumbai Metro Line 3 used a 1000 T crane and they had to divert traffic for nearly 3 months in an extremely people and vehicle dense location to complete the task,” remarks Michael with a roll of his eyes.

Through all this, Safety remains the key consideration. Understanding the risk of every activity is crucial for the team and then to plan and work together on every aspect from design, P&M, EHS, execution. Safety is top priority for the Tunnel Manager too because any load

failures can be catastrophic. “Every day brings new activities and fresh challenges,” chips in G Divakar, EHS Compliance Head, Heavy Civil IC, who has been in the thick of TBM action at several Heavy Civil sites.

No external support; only internal strength

Normally, specialized TBM erection teams from the OEM lead the process of assembly. In the new normal, with overseas teams unable to travel, it has been left to the L&T teams to take

up the onus of assembly with only ‘virtual’ help from OEM engineers. Project Manager, Sridharan Srinivasan, RT 03 Bangalore Metro project, who spearheaded the successful launch of two TBMS at his site shares, “Collectively, we had very little experience in TBM commissioning and zero experience in this type of Slurry TBMs but we took it on as a challenge and our young team of some young and bright engineers were able to pull it off!”

The challenge for Project Manager, Vivek Maruti Pai at the other Bangalore Metro package RT 02 project was to assemble and operate Slurry TBMs to suit Bangalore’s geological conditions, an entirely new proposition. To add to their troubles, the excavation of the shaft was becoming extremely difficult

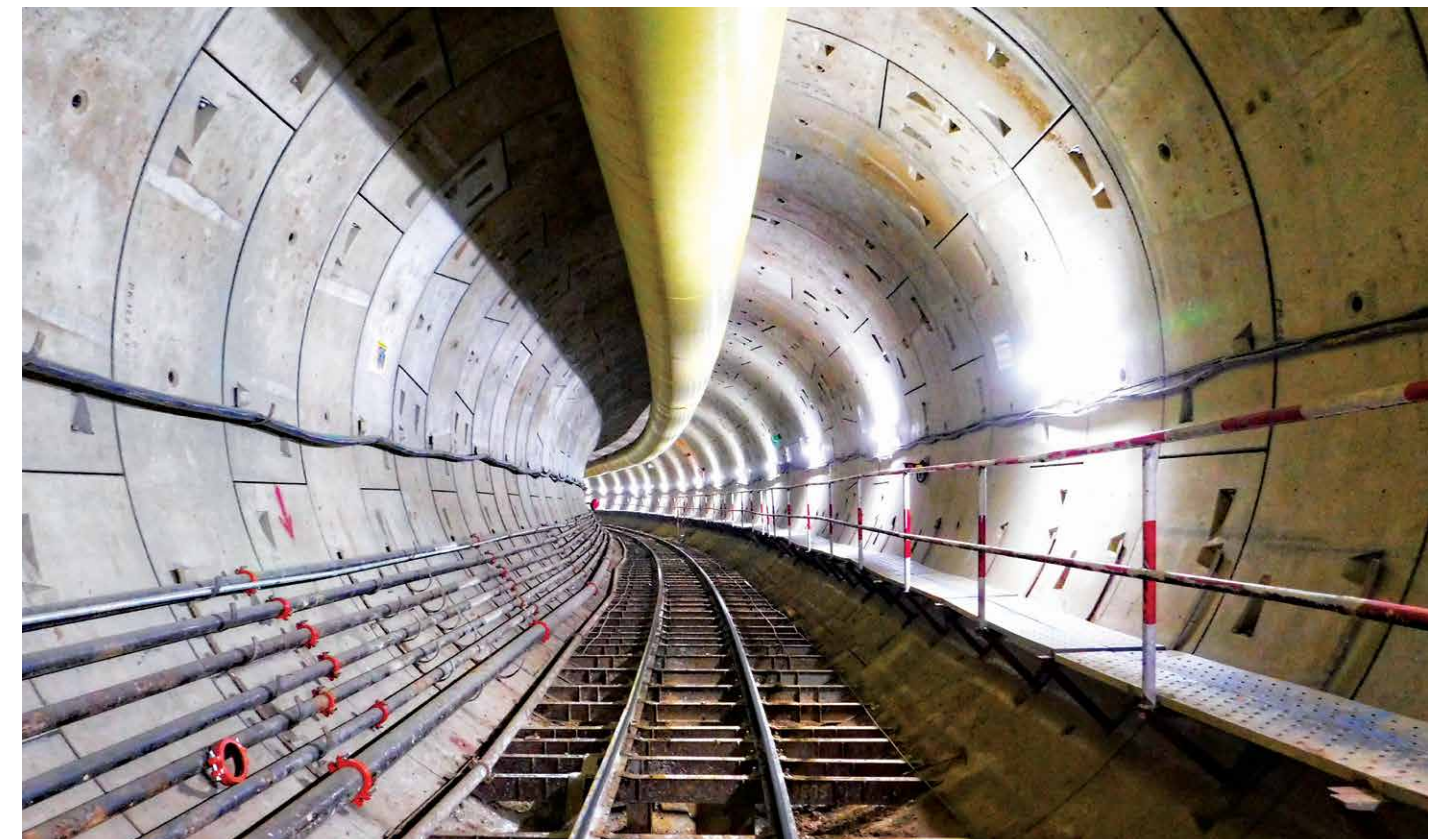
due to certain geological constraints. “We were forced to use an umbilical system that is more complicated both in assembly and operation, but we succeeded.” Vivek is both exultant and relieved.

All in it together

Although there are experts, everyone involved in the TBM assembly must take specific tunnel inductions as different tunnels pose different hazards and safety risks. An EHS Tunnel personnel guide lays down the EHS systems to ensure a safe assembly. All likely hazards and risk must be prior identified and controlled, captured in risk assessment and method statements that are submitted to the client for approval **before** starting the process.

Lowering after the assembly

Once the TBM shield is built, the gantries are lowered. Each gantry has a specific function and has been designed specifically with safety in mind. As the build continues, every part of the TBM must be tested, under a Permit. “Here, the left hand must know what the right is doing,” smiles Michael. “Accidents occur during the assembling and commissioning stage as the machines become very confined so wearing PPE is a must especially protection for the eyes during welding and handling of pressurised hoses,” he stresses. Fire protection systems and personnel must remain on red alert till the build is complete. Work at height needs to



Ahmedabad Metro Tunnel

be considered too when assembling the shield and the gantries in the shaft area. "The shield is round and if you miss your step walking on the top, you can land several meters below so fall protection is important," points out Divakar. Gantries require handrails as walkways over 1 m as anyone can fall, because the existing tunnel lining is used for protection of falls during tunnelling.

Therefore, only authorised persons are allowed into the shaft to ensure safety.

Putting them all together

Gradually the TBM takes shape and every component must function as it is intended to. Tunnel experts use temporary umbilical cords to move the

machine. The sight of the cutter head rotating for the first time is certainly exciting but only privy to the Tunnel team with all safety systems in place with a specific pass system called a 'Tally'. "Everyone must Tally in and Tally Out of the shaft," points out Michael, mentioning the need for a self-rescuer in the shaft area once the TBM starts boring. Gas is measured too for unwanted pockets and, oxygen



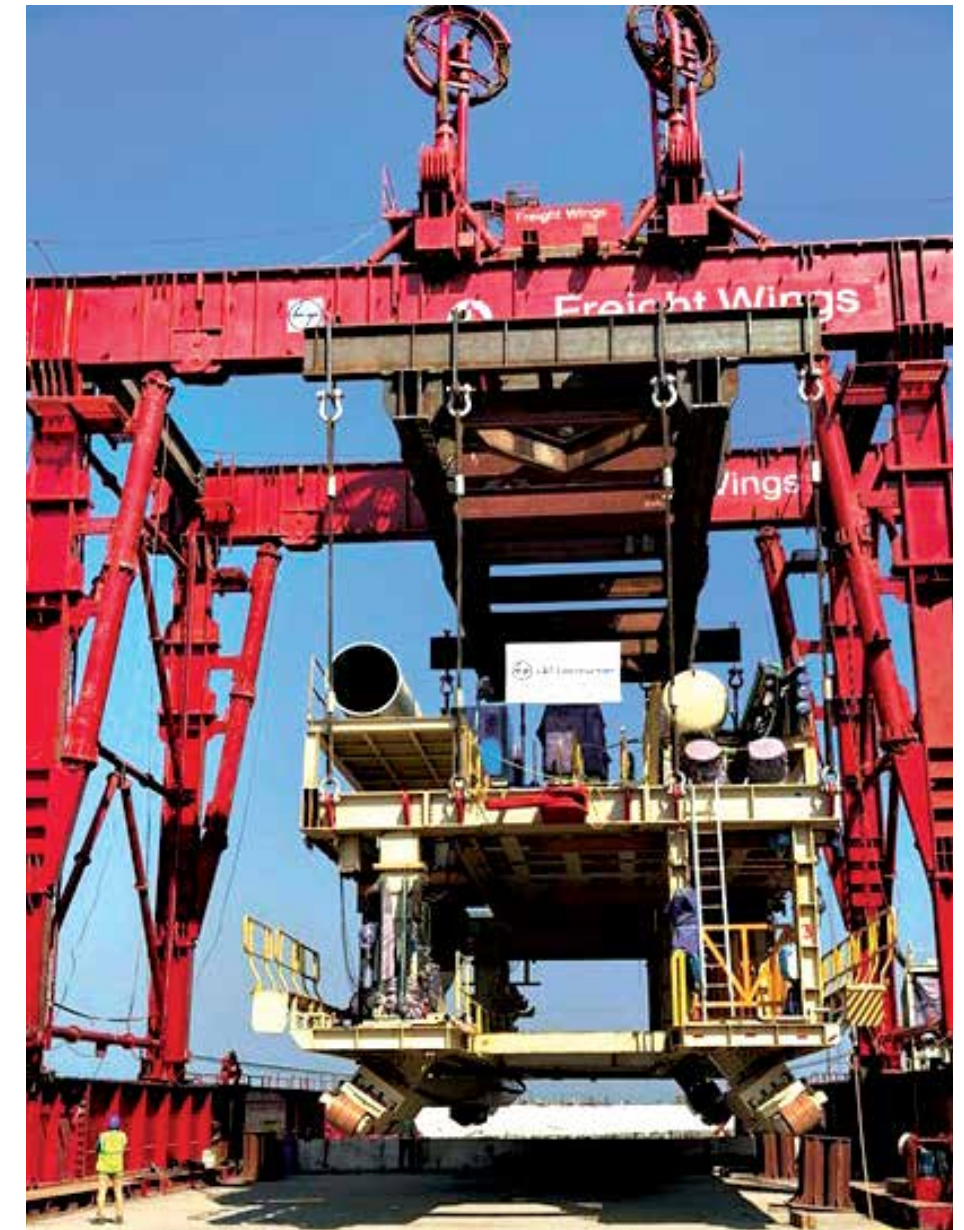
Michael William Sanderson
Head - EHS, HCl IC



Tunnellers are a rare breed. They work all around the world, but team spirit is always the same everywhere you go: Safety runs in their blood like tunnelling.



Launch of TBM Avni at BMRL RT 02



Lifting of TBM backup gantry at Mumbai Coastal Road project, package-04

levels checked. Prior to boring a tunnel, soil investigations are conducted to understand the lay of the land, though risks still exist especially in the form of undetected hazards such as gas or water, so every risk has to be considered to protect workmen and the public.

Assembling a TBM requires meticulous planning, careful preparation, clearly

defined methodology, perfect teamwork, and fastidious adherence to safety protocols. "It is asking for a lot," laughs Michael, but then assembling a TBM does take a lot out of the team. "Tunnellers are a rare breed. They work all around the world, but team spirit is always the same everywhere you go: Safety runs in their blood like tunnelling." ■

8 cheers for B&F projects that aced BSC's 5-Star rating!



Eight B&F projects from across sectors won 5-Star ratings from the British Safety Council (BSC) with audit scores of more than 92% and have thus qualified for the coveted 'Sword of Honour' award. The stringent audit took place for about 20 man-days (in each of the projects with at least two central reviews at headquarters) through the virtual mode.

The virtual audit process involved verification of the adequacy of systems and procedures by verifying data, conducting virtual site visits, and interviewing employees, supervisors & workmen.

The auditors were pleasantly surprised by the look & feel of the work places, the various work practices, the digital initiatives as well as the robust EHS management systems.

BSC's 5-Star audit is recognized worldwide and this is the fifth year running that B&F has received this global recognition for OHS.

15 B&F projects have also bagged RoSPA Gold Awards in 2020.

Kudos to all the project & cluster team members and especially to the EHS Head, leaders and teams for their concerted effort for this significant achievement!

The Winners are:

Chennai Airport (Phase II)

Bengaluru Airport T2

IIT Phase II, Hyderabad

RAMCO Line – III, Jayanthipuram

Raheja Project, Hyderabad

Prestige Jindal City Project, Bengaluru

Piramal Aranya Project, Mumbai

Crescent Bay Project, Mumbai

CLOSE CALL

Work with Machines & Tools

Scenario

A workman was engaged in unloading an AEC (Aerial Earth Conductor) drum at the store area with a Pick-and-carry crane (F-15).

At around 13.40 Hrs. the workman put the web sling in the wire drum to unload it into the store. While inserting the web sling into the hook and fixing the hook latch, the F-15 operator raised the boom of the crane without any instruction. Immediately, the Store In charge instructed to lower the boom. No human injury or material damage occurred during the incident.

What was the cause?

1. The operator was not concentrating on the lifting operation
2. The rigger was not deployed for material handling
3. Lack of supervision during the material handling activity.

What precautions need to be taken to prevent a recurrence?

1. The rigger should be deployed during material handling activities
2. The operator should follow hand signals during the lifting activity
3. Lifting and shifting operations need to be closely supervised
4. Refresher training should be given to site personnel & workmen on safety precautions to be taken, while handling or shifting material
5. The Store In-charge should conduct TBT before starting physical work and remind workmen about the safety precautionary measures.



PHEW!



Syed Abdul Noor
Project Director

All the various components of the STP like sewage lines, valves, pumps, electrical distribution panels and such like can be remotely operated, but most critically, this facility will speed up technical decision making.



For Project Director, Syed Abdul Noor, this is an icing on the cake having delivered a complex and difficult project ahead of time to a satisfied client, the Dubai Municipality. "All the various components of the STP like sewage lines, valves, pumps, electrical distribution panels and such like can be remotely operated," he shares, "but most critically, this facility will speed up technical decision making in the event of any fractures in the network lines or faults in the valves, pumps or any other component. Considering the size, spread and scale of the STP such a modern system with smart applications was required to operate it efficiently."

Built in partnership with Besix, construction of the STP began in March 2016 and it was commissioned in March 2019, one month ahead of contractual delivery date and constructed with utmost safety with the project clocking 10 million safe man hours in the process. The STP has long sewerage network lines of different diameters amounting to 3 million linear meters, ten main pumping, 56 sub-pumping stations and two STPs in Jebel Ali and Al Warsan.

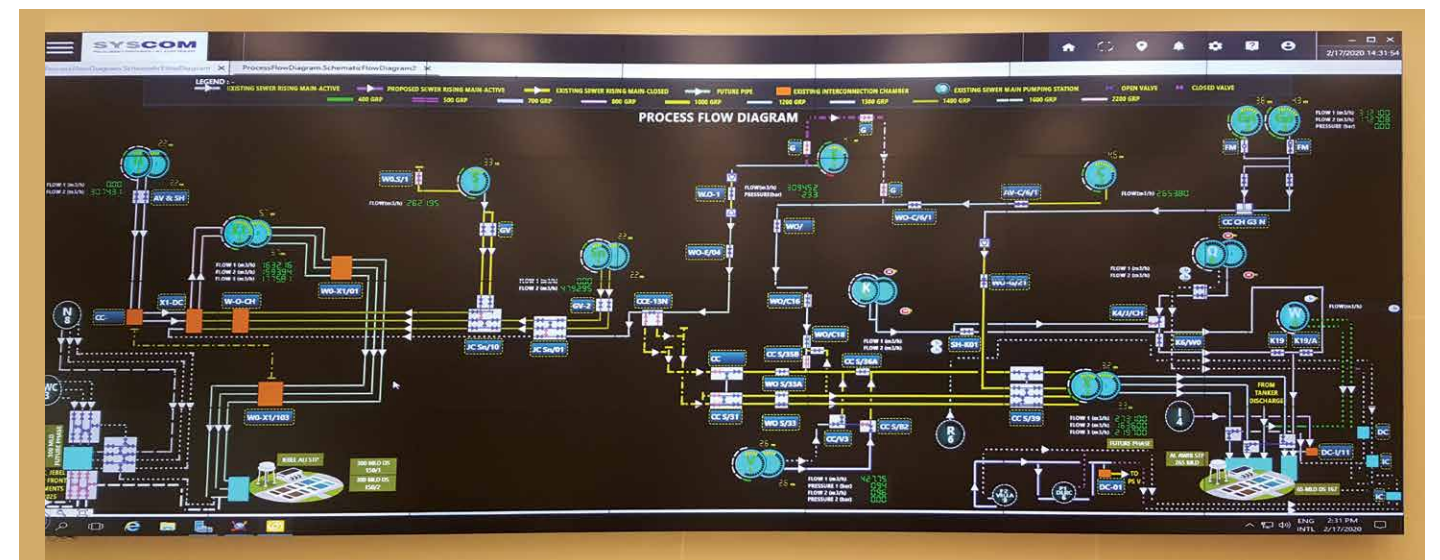
The CCC up close

A large video wall in the CCC streams real time data about all the connected equipment through a master SCADA system. The pumping stations, valves and other equipment are connected to the CCC through a wired private IP internet connection and GSM-based SIMs are a backup to ensure seamless data transfer. A comprehensive database enables supervisors to analyse data, submit reports and evolve quick solutions. There are planning maintenance programmes too that ensure the optimal use of the properties.

Dubai's largest sewage treatment plant can now be remote-controlled!

A huge step forward to enhance the region's sustainability.

The Jebel Ali Sewage Treatment Plant (STP) Phase 2 built by our team from the Water & Effluent Treatment IC is Dubai's largest with a capacity to treat 375 million litres of sewage daily, designed to meet current and future demand generated from the surrounding areas. With the newly inaugurated Command Control Centre (CCC), this state-of-the-art STP can now be comprehensively monitored and controlled remotely, all at the click of a button.



The CCC will help the city of Dubai reduce the use of expensive fresh water by reusing 375,000 litres per day treated sewage effluent for non-potable applications such as irrigation.



Furthering the 'green' mission

With water becoming such a precious commodity the world over, projects like these will make a huge difference to the ecology of the UAE which is why the Jebel Ali STP is critical to the

water conservation plans of the Dubai Municipality. It will help the city of Dubai reduce the use of expensive fresh water by reusing 375,000 litres per day treated sewage effluent for non-potable applications such as irrigation.

The plant ensures true zero discharge by converting the by-products generated

through the treatment process into useful resources. The major by-product is sludge that is anaerobically digested while the solid sludge is pelletized and used as fertilizer.

A legacy for the UAE from L&T, the Jebel Ali STP continues to efficiently clean and green Dubai! ■

A small miscalculation. A big crash. A close call.

On October 2nd, 2020, a lifting system incident occurred at one of our project sites. The lift had been proceeding perfectly: ground levelled with load spreading plates placed on either side and the SPMT axle lines positioned with the required configuration and orientation. The trestle module was then progressively placed, ensuring levelling and alignments. The top beams were then placed, welded, and lashed, on which the lifting girder was placed after which the Strand Jack mounting beams were placed, aligned, and erected. The fixed anchor was then assembled, and the stands inserted into the assembly. The levelling of the strands was in progress, first the left and then the right, and as per procedure minute corrections are normally required after structures are preliminarily arrested. At this point, things went awry: due to an over correction, the lift system shifted and then collapsed. Fortunately, there were NO injuries. Such high-risk activities require perfect planning, and execution as one minor miscalculation can result in a catastrophe that should never happen so we just cannot afford to be complacent.



You cannot afford to drop your guard!

Even as India is weathering the pandemic storm better than most other countries around the world, we, at L&T, have to a large extent controlled the spread of COVID-19 infections and achieved significant progress since the unlock. However, reports about subsequent waves and countries being forced to retreat into lockdowns reveal that the danger is still clear and present. The recent spike in numbers is largely because people have become careless, disregarding the safety advisories, falsely believing that the good old days are back. Nothing can be further from the truth. With a vaccine still in the making, the reality is that it will be dangerous for people to drop their guard for by doing so they will endanger both their lives and of those around them, not to mention the latent threat of asymptomatic people infecting others.



Dr G Sathappan
Chief Medical Officer,
Manapakam HQ

The world is still learning about COVID-19 and so all efforts to stay safe is certainly work in progress. It is a well-established fact that one sure way of staying safe is to break the transmission chain.



Being a respiratory illness, transmitted to people in close contact through droplets produced when an infected person coughs, sneezes or talks, the onus on our project and office teams has been to control the spread, even though

thousands of people work together in proximity at hundreds of construction sites and offices. "The world is still learning about COVID-19 and so all efforts to stay safe is certainly work in progress," observes Dr G Sathappan,

Chief Medical Officer at the Manapakam HQ. "It is a well-established fact that one sure way of staying safe is to break the transmission chain by staying at a safe distance from other people and, at the same time, religiously follow all the advisories issued by the WHO, the governments, Central & State and the local authorities." The encouraging news is that these strictures have been strictly enforced at project sites that has gone a long way to control the spread. "Positive cases are showing a declining trend with very few cases reported recently," confirms Dr Sathappan, "thanks to all the precautions we have been following."

Stay away

If ill, stay away. Of course, progress is critical, but it cannot be at the cost of



P Nagarajan
Head - EHS, B&F IC

Project sites have realigned and re-worked their processes in planning, working in shifts, increasing number of entries & exits at sites and modifying sequence of work to ensure that people are able to maintain a safe distance from each other.



the lives and health of the workforce. By the very nature of the virus, a person can knowingly or unknowingly infect others and hence it is vital that if one feels or suspects having COVID or flu-like symptoms, he/she must stay away, seek

medical counsel, get tested and, if found positive, get quarantined and return to work only after being medically certified to be free from infection. Each employee and workman must be their own judge. This holds good even if someone in one's family or home or neighbourhood in close contact with is showing symptoms.

Keep safe distance

While it is relatively easier to shift to 'virtual' meetings, conference calls and video conferencing in offices to maintain social distancing, it is far more difficult at project sites where multiple hands are required to perform tasks. "Project sites have realigned and re-worked their processes in planning, working in shifts, increasing number of entries & exits at sites and modifying



Maintaining strict social distancing at a project site


sequence of work to ensure that people are able to maintain a safe distance from each other," remarks P Nagarajan, Head - EHS, B&F IC. "Modified protocols and systems have been discussed with clients and consultants for smooth operations," he adds. With the everpresent pressure to keep things ticking along, site leadership and management have realized that it pays to stay safe rather than being reckless in the pursuit of progress.

Re-arranging accommodation at labour colonies, reducing the number of people working in restricted spaces, introducing alternating workdays or extra night shifts, increasing transport facilities so that less workmen travel together are some other safety precautions taken at sites. An effective ploy, for example, adopted by several sites of MMH SBG has been to introduce 'COVID Watchers' drawn from workmen mandated to ensure compliance with the COVID

SOPs. "They report into our COVID Warriors who are our medical and EHS staff," explains Dr K N Sen, Head - EHS, MMH SBG, "who in turn apprise the COVID task force to ensure control." The creation of a COVID Crisis Command Centre at MMH's Mansourah Massarah Gold Project involving the client, the consortium partner, the senior management, the medical team and staff members has lent muscle to their effort to combat the pandemic.



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The COVID Watchers report into our COVID Warriors who are our medical and EHS staff, who in turn apprise the COVID task force to ensure control.

Dr K N Sen
Head - EHS, MMH SBG

Cover faces, keep hands clean

Though cumbersome, unfortunately a mask has become a mandatory accessory for some time to come as is practicing 'hand hygiene.' It is essential to keep washing hands before and after shifts and/or breaks, after blowing one's nose, after using the rest room, before eating, after preparing food, after touching objects like tools and equipment that are being handled by co-workmen, before donning or taking off gloves, before donning or doffing eye or face protection like safety glasses, goggles, etc. and putting on, touching, or removing masks with sanitizers containing 60% alcohol. Make eyes, nose or mouth hands-free!

Implement, assess, ensure and review

The success of any system lies in its effective implementation and the continued effectiveness of the COVID precautionary measures depend on how well everyone aligns to them. The laxness of even one individual can be disastrous for an entire office or site.

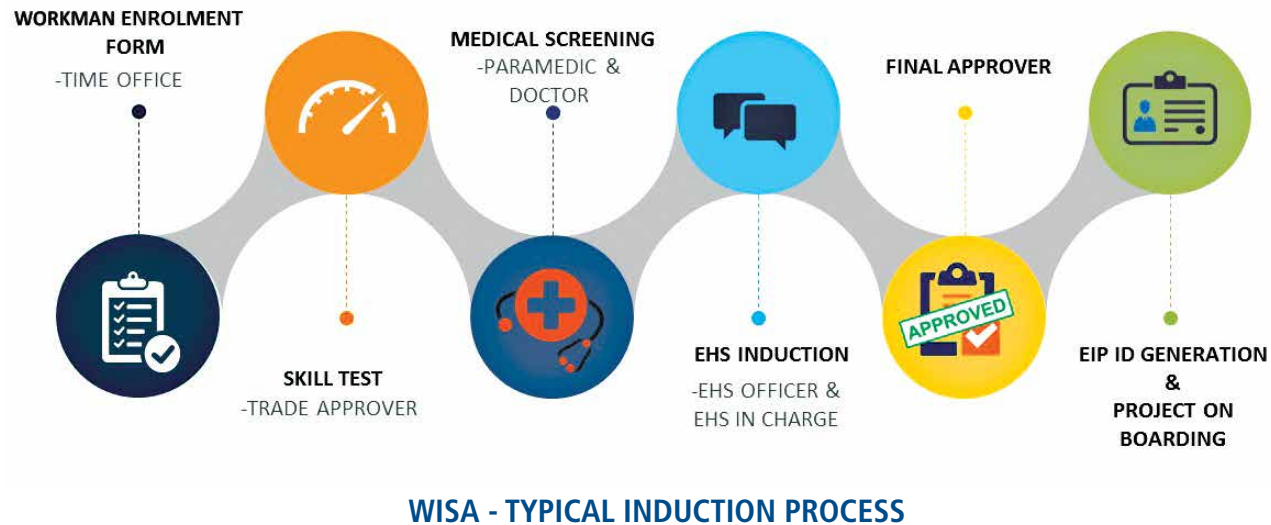


"We conduct regular risk assessments to determine if hazards exist at our workplace," shares Nagarajan with the onus sitting squarely on Medical and EHS personnel to determine, select, provide, train both workmen and employees on the correct use of COVID PPE. "Employees and workmen are provided with a platform for reporting hazards or giving suggestions for improvement in the workplace related to COVID-19," he elaborates.

"The pandemic is not going anywhere in a hurry," warns Dr Sathappan, in conclusion, "and hence it is extremely important for every one of us to be constantly on our guard, not letting it down even for a moment because you never know where and how COVID-19 will strike."

Let us all at L&T Construction take this warning to heart and continue to stay safe while we push forward to make up lost ground. ■

WISA: The ticket to efficient workmen onboarding



Digital solutions have been driving efficiencies at L&T Construction ever since we embarked on our journey of digital transformation about four years ago. Since its launch in August 2019, WISA (Workforce Induction & Skills Application) is a digital tool that has gained significant traction with project sites across ICs to manage the end-to-end processes of onboarding and managing the workforce. Its stringent checks and validations enabled site HR to capture information about workmen, cleanly and correctly that helped create a database of nearly 4 lakh workmen by the time the country locked down against the pandemic.

A boon during tough times

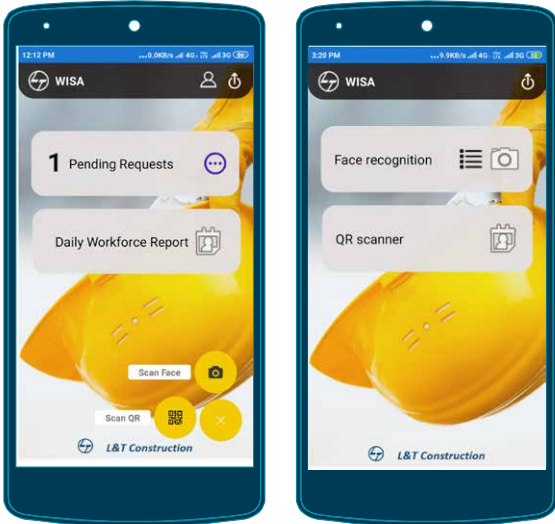
The WISA data initially proved to be extremely useful to draw insights about the migratory trends of workmen but, even more critically, turned out to be a boon for the humungous workmen remobilization effort. As part of the onboarding process, WISA captured and validated the mobile numbers of workmen with which the organization was able to reach out to them individually during these tough times. “We ran multiple campaigns using bulk messaging service to create awareness among the workmen about self-hygiene and

Krithika Venkatesh
Senior Manager - Digital

It was important to keep track and a daily count of these workmen at our various labour colonies. WISA's QR-based attendance feature enabled sites to do contactless attendance and maintain records of the same.

COVID SOPs,” informs S Anantha Sayana, Chief Digital Officer, L&T. “Since the application also held data about the state of origin of our workmen, we could spread the good word in their native languages to more than 3 lakh workmen.”

The announcement of the lockdown had sent lakhs scurrying to their native places that rapidly depleted the number of workmen at the various L&T Construction sites from around 3.25 lakhs to about 1.25 lakhs and their families. “It was important to keep track and a daily count of these workmen at our various labour colonies,” points out Senior Manager – Digital, Krithika Venkatesh. “WISA was the answer,” she smiles. “It’s QR-based attendance feature enabled sites to do contactless attendance and maintain records of the same.”

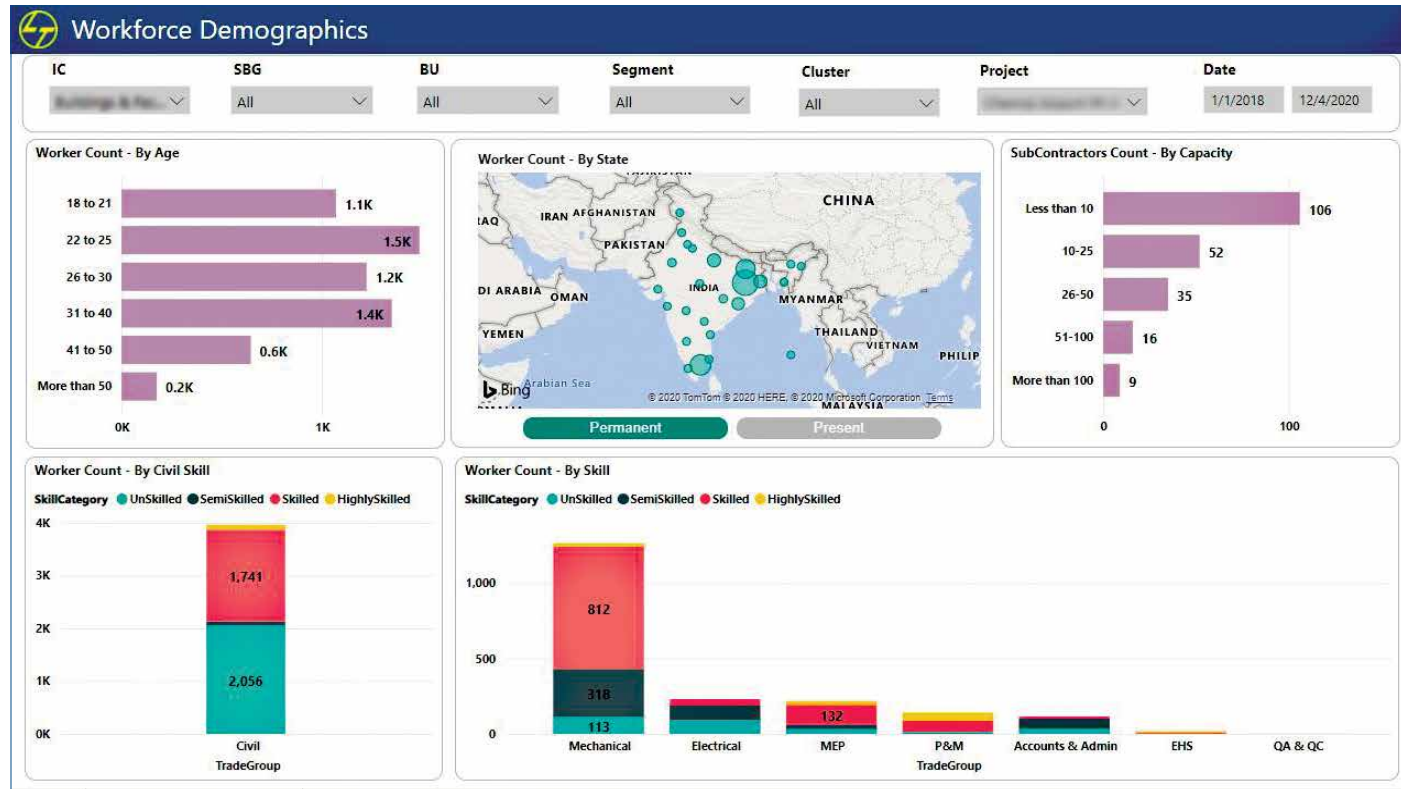


WISA hastens return to normal

After the labour exodus, project sites went into overdrive to re-mobilize workmen to push progress. WISA came

in handy again for corporate and site HR & IR teams to reach out by sending bulk messages to subcontractors and workmen about the opportunities at various sites across the country. Multiple reach-out campaigns were





Be it the quality of data or the enhancements, it would not have been possible without the support and continuous feedback from all the IC and site teams.

S Anantha Sayana
Chief Digital Officer, L&T



run again with the support of the IC and site mobilization teams to convince workmen to return to sites post the lockdown.

A most critical criteria to be considered during workmen inductions post the lockdown was their COVID-19 record. It warranted fresh SOPs to ascertain and record if a workman was coming from a COVID-affected area and his subsequent health screenings. "All these validations

were incorporated into WISA for sites to monitor their new inductees right from Day 1 to restart operations," mentions Krithika

The transition from fingerprint-based to contactless attendance as sites was smoothed as sites quickly adopted the attendance feature in WISA that required no infrastructure requirement.

The success of any solution rests on quick adoption and ready feedback for further enhancements. "Be it the quality of data or the enhancements, it would not have been possible without the support and continuous feedback from all the IC and site teams," sums up Anantha.

Today, WISA is a testimony to appreciate the value of quality of data in a central system and the potential of using that data for critical business needs. Another digital solution scores! ■

Implementation Statistics



CLOSE CALL

Hydraulic Crane Work

Scenario

The operator of a hydraulic crane tried to lift a load, which was more than the safe working load, bypassing the SLI to complete the assigned task. When the crane was lifting the load, the piston of the hydraulic cylinder got bent.

What was the cause?

1. Utilizing a lesser capacity crane
2. Lifting a load more than safe lifting capacity of the crane
3. The operator bypassed the SLI.


What precautions need to be taken to prevent a recurrence?

1. Select the right equipment with respect to the load to be lifted
2. Carry out risk assessment with respect to equipment selection and deployment for the activity
3. Train operators about the consequence of deviating from safety norms.



PHEW!

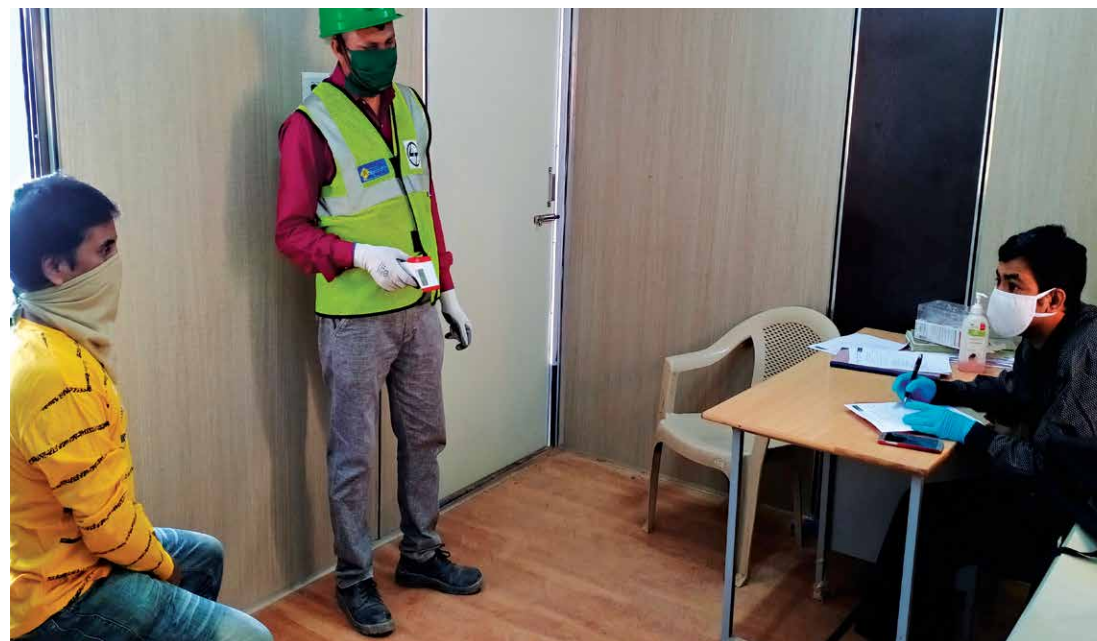



At our construction sites, everyone including clients are wearing masks along with all the necessary PPEs revealing an enhanced level of commitment towards EHS implementation and Digitalization to achieve Vision Zero Harm at every level of business operation.

K S Sudheesh Kumar
 Head - EHS, WETIC

oft heard complaints in recent times best explained when listening to ground reports from TV journalists. Even so, people are learning to speak with greater vocal inflections, varying pitches, and tones of voice, and even using eyes and eyebrows to greater effect!

Certainly, those with hearing difficulties are the hardest hit who constitute about 5% of the world's population. Apart from loss of clarity, lip reading has been completely taken out of the equation leading to experiments in transparent masks.



Interestingly, at construction sites, the mandate can be considered a blessing in disguise. "All our sites pose respiratory hazards like particulate or vapor hazards," warns, V Ramanathan, Head - EHS, PT&D IC, "and therefore it is not just about wearing masks but using hazard-specific Respiratory Protective Equipment or RPE." An industry that records a high incidence of lung-related ailments, masks protect workmen and supervisors from inhaling the dreaded silica dust that is proving to be the undoing of many, apart from other toxic dust and vapours.

In his famous book, *Think and grow rich*, Napoleon Hill once said, "Every adversity, every failure, every heartache comes with the seed of an equal or greater benefit." K S Sudheesh Kumar, Head - EHS, WET IC elaborates, "At our construction sites, everyone including clients are wearing masks along with all the necessary PPEs revealing an enhanced level of commitment towards EHS implementation and Digitalization to achieve Vision Zero Harm at every level of business operation."

With masks unavoidable, it pays to follow a few ground rules to communicate effectively from behind it:

- First and foremost, ascertain if you have correctly identified the person you wish to communicate with

- Get his/her attention and establish eye contact **before** starting the conversation
- It is always better to face the person you are addressing
- Speak a little louder than normal without shouting
- Speak slower than normal; it helps to over-stress your words
- Body language can come in very handy
- Amplify verbal and visual cues like intonations, nodding, pronounced movement of eyes, eyebrows, and hands
- Use of hand gestures can be effective especially in a noisy site atmosphere or during PEP talks at project sites
- Keep checking if the receiver has received the message the way that you want him/her to understand it.
- Be more empathetic, patient, and focused

The Coronavirus has come to live with us. Measures like maintaining social distancing and wearing masks will have to continue not only to protect yourself but our colleagues and loved ones until we are able to overcome the virus. At all times, let us keep following the 3 Ws - Wear a mask, Wash your hands and Watch your distance from others. Till such time that we are not out of harm's way, if we have lemons, let us make lemonade! ■

**At all times, let us keep following the 3Ws -
 Wear a mask, Wash your hands and
 Watch your distance from others.**

Safety

Roll of Honour

Helmet congratulates the following sites for achieving million and more LTI free safe man-hours

BUILDINGS & FACTORIES IC

33 Wipro IT SEZ Project, Bengaluru
Million Safe Man Hours
December 2016 to September 2020

28 Crescent Bay Project, Mumbai
Million Safe Man Hours
January 2016 to September 2020

26 ICC Dwarka Project
Million Safe Man Hours
February 2018 to September 2020

25 DLF Cyber Park Project, Gurgaon
Million Safe Man Hours
December 2015 to September 2020

21 Cricket Stadium Project, Motera
Million Safe Man Hours
January 2017 to September 2020

20 Rustomjee Crown Project, Mumbai
Million Safe Man Hours
April 2010 to September 2020

20 One ICC and Two ICC Bombay Realty
Million Safe Man Hours
November 2017 to September 2020

16 Oberoi Sky City Project, Borivali
Million Safe Man Hours
June 2016 to September 2020

16 Prestige Song of the South Project, Bengaluru
Million Safe Man Hours
April 2016 to September 2020

16 TATA Housing Project, Kolkata
Million Safe Man Hours
September 2014 to September 2020

14 IGH Dwaraka Project, Delhi
Million Safe Man Hours
September 2014 to September 2020

14 Raintree Boulevard Project Bengaluru
Million Safe Man Hours
September 2016 to September 2020

12 BIAL T2 Airport Project, Bengaluru
Million Safe Man Hours
August 2019 to September 2020

12 Statue of Unity Project
Million Safe Man Hours
March 2018 to September 2020

11 Oberoi Eternia Mulund Project, Mumbai
Million Safe Man Hours
January 2017 to September 2020

TRANSPORTATION INFRASTRUCTURE IC

37 Western Dedicated Freight Corridor Corporation CTP - 12
Million Safe Man Hours
August 2017 to September 2020

20 Delhi Agra Road Project
Million Safe Man Hours
July 2016 to September 2020

19 Hospet Chitradurga Road Project
Million Safe Man Hours
May 2017 to September 2020

Safety

Roll of Honour

15 WDFC CTP-14
Million Safe Man Hours
February 2017 to September 2020

14 Yadgiri Warangal Road Project
Million Safe Man Hours
June 2016 to September 2020

13 EDFC - CP-303
Million Safe Man Hours
March 2018 to September 2020

12 Mumbai Nagpur Expressway MNEP
Million Safe Man Hours
November 2018 to September 2020

10 Baharagora Singhara Road Project
Million Safe Man Hours
November 2017 to September 2020

9 BIAL Runway
Million Safe Man Hours
December 2018 to September 2020

9 Delhi Airport II (TI IC)
Million Safe Man Hours
April 2019 to September 2020

Safety

Roll of Honour

- 8 **Mukkola - KL/TN Border Road Project**
Million Safe Man Hours
June 2016 to September 2020
- 7 **Bidkin Industrial Area (Package - I)**
Million Safe Man Hours
July 2017 to September 2020
- 7 **Bar Bilara Jodhpur Road Project**
Million Safe Man Hours
April 2017 to September 2020
- 7 **Villukuri Kanyakumari Road Project**
Million Safe Man Hours
September 2016 to September 2020
- 6 **Raipur Bilaspur Road Project- Pkg-II**
Million Safe Man Hours
September 2016 to September 2020
- 5 **WDFC CTP 3R**
Million Safe Man Hours
March 2020 to September 2020
- 5 **Chandigarh Kharar Elevated Corridor**
Million Safe Man Hours
August 2016 to September 2020

- 5 **Aurangabad to Karodi**
Million Safe Man Hours
October 2018 to September 2020
- 5 **Pragati Maidan**
Million Safe Man Hours
December 2017 to September 2020
- 3 **Dept Code - Central Office TI -RKJLRP(Jabalpur MP)**
Million Safe Man Hours
January 2019 to September 2020
- 3 **Ghoshpukur Salsalabari Road Project**
Million Safe Man Hours
September 2019 to September 2020
- 2 **LRT Mauritius**
Million Safe Man Hours
May 2019 to September 2020

RAILWAY SBG

- 11 **OPGC MGR Project**
Million Safe Man Hours
July 2015 to September 2020
- 9 **Riyadh Metro Project**
Million Safe Man Hours
December 2015 to September 2020

Safety

Roll of Honour

- 5 **Roha Verna Railway Electrification Project**
Million Safe Man Hours
May 2017 to September 2020
- 5 **WDFC EMP-4**
Million Safe Man Hours
May 2015 to September 2020
- 3 **WDFC EMP - 16**
Million Safe Man Hours
May 2016 to September 2020
- 3 **DMRC CE - 07**
Million Safe Man Hours
July 2013 to September 2020
- 3 **EDFC CP 204**
Million Safe Man Hours
June 2016 to September 2020
- 2 **Delhi Core Project**
Million Safe Man Hours
July 2018 to September 2020
- 6 **765 kV ERSSTL01 Ranchi-Medinipur TL**
Million Safe Man Hours
September 2018 to September 2020

POWER TRANSMISSION & DISTRIBUTION IC

- 6 **Phase XI Addendum Packages**
Million Safe Man Hours
May 2016 to September 2020
- 6 **250 MW ACEPL SPV Plant MP**
Million Safe Man Hours
January 2018 to September 2020
- 5 **Erection Job for ODSSP PH II PKG 4**
Million Safe Man Hours
January 2016 to September 2020
- 5 **ODSSP Phase-III Package-4**
Million Safe Man Hours
August 2016 to September 2020
- 4 **R-TL-Trans Scheme- Consultancy Serv-JSEB-PCGIL**
Million Safe Man Hours
May 2013 to September 2020
- 4 **UG Cabling works under Advance Scrips Project**
Million Safe Man Hours
October 2016 to September 2020
- 4 **Replace Electrical Equipment at Southern Area GOSPs**
Million Safe Man Hours
April 2016 to September 2020

Safety

Roll of Honour

4 UPD-Saubh-1 Meerut/Bagpat/
Ghazb/Hapur PVVNL
(Shaubhagya Cluster-1)
Million Safe Man Hours
May 2018 to September 2020

3 RGGVY Jammu - PGCIL
Million Safe Man Hours
April 2018 to September 2020

3 UPD-Saubha2 Saharanpur/
Muzaffarnagar/Shaml PVVNL
(Shaubhagya Cluster-2)
Million Safe Man Hours
May 2018 to September 2020

3 UPD-IPDS KANPUR-KESCO
Million Safe Man Hours
November 2016 to September 2020

3 Saubhagya - RE works at Basti
Sant Kabir Nagar
Million Safe Man Hours
May 2018 to September 2020

3 V-UPD-Saubhagya RE works
Gorakhpur Deoria-PUVVNL
Million Safe Man Hours
May 2018 to September 2020

3 V-UPD-Saubhagya-RE works
Ghazipur Chandauli-PUVVNL
Million Safe Man Hours
June 2018 to September 2020

3 LE180002-400 kV Switching
Station at Al Dhafrah
Million Safe Man Hours
May 2018 to September 2020

3 C-SS-UG cabling works in
Vishakapatnam (Pkg-2)
Million Safe Man Hours
February 2018 to September 2020

3 Erection Job for ODSSP PH II
PKG 3
Million Safe Man Hours
February 2017 to September 2020

3 Rural Electrical Work Under
DDUGJY (WESCO) PK-4
Million Safe Man Hours
January 2017 to September 2020

2 100 MW(AC) SBE SPV Plant
Bhadla
Million Safe Man Hours
March 2018 to September 2020

2 132/66 kV Tower Package TW02
Sikkim TL
Million Safe Man Hours
March 2016 to September 2020

2 DDUGJY RE Works in
Madhubani - NBPDCCL
Million Safe Man Hours
March 2018 to September 2020

2 IPDS Works in PESU(West)-
SBPDCL
Million Safe Man Hours
February 2018 to September 2020

2 Electrification Works under
IPDS Scheme
Million Safe Man Hours
November 2017 to September 2020

2 K-SS- DDUGJY Hooghly
(WBSEDCL)
Million Safe Man Hours
July 2017 to September 2020

2 K-SS- DDUGJY Nadia (WBSEDCL)
Million Safe Man Hours
July 2017 to September 2020

2 K-SS- DDUGJY Paschim
Midnapore (WBSEDCL)
Million Safe Man Hours
January 2018 to September 2020

Safety

Roll of Honour

2 K-SS- DDUGJY North 24
Parganas (WBSEDCL)
Million Safe Man Hours
January 2018 to September 2020

2 K-SS- DDUGJY Birbhum
(WBSEDCL)
Million Safe Man Hours
February 2018 to September 2020

2 UPD-Saubhagya Lakhimpur
Kheri Dist-MVVNL
Million Safe Man Hours
April 2018 to September 2020

2 Construction of 380 kV Double
Circuit Overhead Transmission
Line between Qassim-2
BSP#9025 and Madina East
(MDE) BSP#21900
Million Safe Man Hours
December 2017 to September 2020

2 LE130286-MTC-Airside Works
(Electrical), Abu Dhabi Airport
Million Safe Man Hours
September 2013 to September 2020

2 LE170322-A-12838 4 Nos of SS in
Al Ain Region
Million Safe Man Hours
September 2017 to September 2020

Safety

Roll of Honour

HEAVY CIVIL INFRASTRUCTURE IC

- 116** **Riyadh Metro JV**
Million Safe Man Hours
- 18** **Kakrapar – Main Plant Project**
Million Safe Man Hours
- 14** **Vizag vessels Project**
Million Safe Man Hours
- 11** **Kudankulam Main Plant Project**
Million Safe Man Hours
- 11** **Kalpakkam - WMP & Allied Project**
Million Safe Man Hours
- 11** **Kudankulam Hydrostructure-
HTS Project**
Million Safe Man Hours
- 7** **WDFCC CTP 14 Project**
Million Safe Man Hours
- 7** **Barapullah Bridge, Delhi**
Million Safe Man Hours
- 7** **WDFC 15 A Bridge Project**
Million Safe Man Hours

- 6** **AFA - Hyderabad Project**
Million Safe Man Hours
- 6** **VIH project**
Million Safe Man Hours
- 6** **Kakrapar – NDCT Project**
Million Safe Man Hours
- 6** **Kakrapar – IDCT Project**
Million Safe Man Hours
- 5** **Mumbai Metro UGC 07 Project**
Million Safe Man Hours
- 5** **Kalpakkam-FRP Project**
Million Safe Man Hours
- 5** **MTHL Package-1 Project**
Million Safe Man Hours
- 5** **Mumbai metro UGC01 Project**
Million Safe Man Hours
- 4** **Kochi Dry Dock Project**
Million Safe Man Hours
- 4** **Sea Bird Project**
Million Safe Man Hours

- 4** **Iswar Gupta Bridge Project**
Million Safe Man Hours
- 4** **RAPP Project**
Million Safe Man Hours
- 4** **ZF Shillong Project**
Million Safe Man Hours
- 3** **Khulna Mongla Bridge**
Million Safe Man Hours
- 3** **WDFC 15 B Bridge Project**
Million Safe Man Hours
- 3** **Mandovi Bridge Project, Goa**
Million Safe Man Hours
- 3** **Bangalore Metro - RT02 Project**
Million Safe Man Hours
- 2** **Kakrapar – CSP Project**
Million Safe Man Hours
- 2** **WDFC 15 C Bridge**
Million Safe Man Hours
- 2** **ZH1 Port Blair Project**
Million Safe Man Hours

Safety

Roll of Honour

- 2** **ZB Ambala Project**
Million Safe Man Hours
 - 2** **Bangalore Metro -RT03 Project**
Million Safe Man Hours
 - 2** **MTHL Package-3 Project**
Million Safe Man Hours
 - 1** **MEGA Project, GMRC**
Million Safe Man Hours
 - 1** **Kalpakkam - FRFCF IGCAR
Project**
Million Safe Man Hours
 - 1** **Kachchi Darga Bridge Project**
Million Safe Man Hours
- ### WATER & EFFLUENT TREATMENT IC
- 10** **Laying of Sewers at Cuttack**
Million Safe Man Hours
 - 9** **Bhatpara Sewer Network and
Waste Water Treatment**
Million Safe Man Hours

Safety

Roll of Honour

- 6 **Integrated Sewerage Work - Pali (Design and Build)**
Million Safe Man Hours
- 6 **Sewerage Scheme in Varanasi City**
Million Safe Man Hours
- 6 **Banswara District & Pratapgarh District WSS**
Million Safe Man Hours
- 6 **DHOLERA SIR**
Million Safe Man Hours
- 5 **O and M for Sri Sathya Sai Water Supply Anantapur**
Million Safe Man Hours
- 5 **DWSP**
Million Safe Man Hours
- 4 **Water Supply scheme to Erode Corporation**
Million Safe Man Hours
- 4 **WS Scheme- Balasore/Bhadrak/Keonjhar/Puri/Bolangir**
Million Safe Man Hours

- 4 **Infrastructure Works in Bidkin**
Million Safe Man Hours
- 4 **Nellore UGDS**
Million Safe Man Hours
- 4 **Execution of Lift Canal System of UIIP Kalahandi**
Million Safe Man Hours
- 4 **Rourkela WWS**
Million Safe Man Hours
- 4 **Tanzania Water Supply Scheme Dept Code**
Million Safe Man Hours
- 4 **Pune ESR and GSR**
Million Safe Man Hours
- 4 **ISP - Kalisindh Ph I MLIS**
Million Safe Man Hours
- 3 **9 Nos LIS in Cluster-VI IN Cuttack Dist**
Million Safe Man Hours
- 3 **Barrackpore Sewerage Integration Work**
Million Safe Man Hours

- 3 **Koppal WSP**
Million Safe Man Hours
- 3 **Ranchi Urban Water Supply Scheme**
Million Safe Man Hours
- 3 **Kundalia Irrigation Project-Right Bank**
Million Safe Man Hours
- 3 **Chhaigaonmakhan LIS**
Million Safe Man Hours
- 3 **MLIP Cluster XII**
Million Safe Man Hours
- 3 **Udaipur Integrated Infrastructure Project**
Million Safe Man Hours
- 3 **Development of IT City**
Million Safe Man Hours
- 3 **Sikar Alwar Bhiwadi Cluster Sewerage Project**
Million Safe Man Hours
- 3 **Vijayawada SWD**
Million Safe Man Hours

Safety

Roll of Honour

- 3 **Hogenakkal - PKG V - O and M**
Million Safe Man Hours
- 3 **Cuttack Water Supply Project**
Million Safe Man Hours
- 3 **WTP for NMDC**
Million Safe Man Hours
- 3 **Providing Sewerage Facility in Mohan Garden**
Million Safe Man Hours
- 3 **Industrial Area STP Qatar**
Million Safe Man Hours
- 3 **Rehab Works at Colombo**
Million Safe Man Hours
- 2 **IMT Rohtak Phase III**
Million Safe Man Hours
- 2 **Cuddalore PH.I**
Million Safe Man Hours
- 2 **Moradabad Sewerage Scheme**
Million Safe Man Hours

Safety

Roll of Honour

- 2 **RRWSFMP-Package 7 (Nagaur CDS-04)-Degana**
Million Safe Man Hours
- 2 **Alirajpur LIS**
Million Safe Man Hours
- 2 **Int Passavant JV Dept Code**
Million Safe Man Hours
- 2 **Cuttack Sewer Scheme Phase-2 Construction**
Million Safe Man Hours
- 2 **Kakrapar LIS**
Million Safe Man Hours
- 2 **BDA NPKL Package 1**
Million Safe Man Hours
- 2 **Narmada Kshipra Multipurpose Project**
Million Safe Man Hours
- 2 **Water Supply to Karimnagar and other Municipalities**
Million Safe Man Hours
- 2 **Improvement of Water Supply to Greater Berhampur**
Million Safe Man Hours

- 2 **O and M for Adilabad Project**
Million Safe Man Hours
- 2 **MLIP Cluster IX**
Million Safe Man Hours
- 2 **Beur Sewerage Network-Patna**
Million Safe Man Hours
- 2 **O and M East and West Godavari**
Million Safe Man Hours
- 2 **12 Nos LIS in Cluster-XI in Jajpur And Kendrapara**
Million Safe Man Hours
- 2 **HPCL Vizag - ETP**
Million Safe Man Hours
- 2 **Hogenakkal - PKG III O and M**
Million Safe Man Hours
- 2 **O and M for Khammam Project**
Million Safe Man Hours
- 2 **RRWSFMP-Package 6 Nagaur CDS-03-Deedwana**
Million Safe Man Hours

- 2 **13 Nos LIS in Cluster-VIII in Anguldeogarh Sunderg**
Million Safe Man Hours
- 2 **RRWSFMP-Package 5 (Nagaur CDS-02)-Makrana**
Million Safe Man Hours
- 2 **Water Supply facilities to Bommanahalli Zone**
Million Safe Man Hours
- 2 **Integrated WS and WW Sri Ganganagar Project (DB)**
Million Safe Man Hours
- 1 **Allahabad Sewerage Network**
Million Safe Man Hours
- 1 **Satna MVRWSS**
Million Safe Man Hours
- 1 **O and M for Bhagirathi WTP, Delhi**
Million Safe Man Hours
- 1 **VSP Reservoir**
Million Safe Man Hours

Safety

Roll of Honour

- 1 **Chhatarpur WSS**
Million Safe Man Hours
- 1 **Keonjhar Water Supply Project**
Million Safe Man Hours
- 1 **Mohanpura MVRWSS**
Million Safe Man Hours
- 1 **Kundalia Irrigation Project-Left Bank**
Million Safe Man Hours
- 1 **24X7 Water Supply to Tumakuru City**
Million Safe Man Hours
- 1 **Saidpur Sewerage Network**
Million Safe Man Hours
- 1 **Kirulapone-WWS**
Million Safe Man Hours
- 1 **Indore-UWSS**
Million Safe Man Hours
- 1 **Faridabad Smart City**
Million Safe Man Hours

Safety

Roll of Honour

- 1 **Moga WSS**
Million Safe Man Hours
- 1 **KPCL-WSP**
Million Safe Man Hours
- 1 **Coimbatore UGSS Phase-II**
Million Safe Man Hours
- 1 **Jawai Cluster - IV WSS
(224 Villages)**
Million Safe Man Hours
- 1 **UGD 110 Villages - RR Nagar
Dasarahalli zone**
Million Safe Man Hours
- 1 **Kanpur Water Carrier System**
Million Safe Man Hours
- 1 **Nandawadagi LIS**
Million Safe Man Hours
- 1 **Surya WSS**
Million Safe Man Hours
- 1 **Tirunelveli UGSS - Phase II**
Million Safe Man Hours

METALLURGICAL & MATERIAL HANDLING SBG

- 39 **Hot Strip Mill, RSP, Rourkela**
Million Safe Man Hours
- 19 **Coal Handling Plant, RRVUNL,
Chhabra**
Million Safe Man Hours
- 11 **Coal Handling Plant,
Khargone**
Million Safe Man Hours
- 9 **Slab Caster, Bokaro**
Million Safe Man Hours
- 9 **LTEW, Kanchipuram**
Million Safe Man Hours
- 6 **JSW, Dolvi**
Million Safe Man Hours
- 5 **New Fabrication Yard,
Kansbahal**
Million Safe Man Hours

Safety

Roll of Honour

- 3 **Maintenance of Machines,
NLC, Neyveli**
Million Safe Man Hours
- 3 **Coal Handling Plant and Ash
Handling Plant, Tanda**
Million Safe Man Hours
- 2 **Civil and Structural Works,
UAIL, Rayagada**
Million Safe Man Hours
- 2 **Coal Handling Plant, MCL,
Bhubaneswari**
Million Safe Man Hours
- 2 **Mansourah Massarah Gold
Project, KSA**
Million Safe Man Hours
- 3 **TANGEDCO – Uppur**
Million Safe Man Hours
May 2018 to September 2020
- 3 **Navigational Lock - Farakka**
Million Safe Man Hours
December 2016 to September 2020
- 3 **IWAI - Sahibganj**
Million Safe Man Hours
December 2016 to September 2020
- 3 **BHEL – Ennore**
Million Safe Man Hours
November 2017 to September 2020
- 2 **JSW- EQ1-EQ2- Paradip**
Million Safe Man Hours
January 2018 to September 2020
- 2 **CMRL Package- Chennai**
Million Safe Man Hours
March 2019 to September 2020
- 2 **NTPGC - Nabinagar**
Million Safe Man Hours
May 2015 to September 2020
- 1 **MTHL- Mumbai**
Million Safe Man Hours
September 2018 to September 2020



53 REASONS TO CELEBRATE EXCELLENCE IN SAFETY!

53

of our sites across businesses have won **RoSPA Gold Awards in 2020!**

16 WET IC	15 B&F IC	12 PT&D IC
07 TI IC	02 HCI IC	01 MMH SBG



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