

Case Study

Superior Project Management to Simplify and Deliver Mammoth Projects

Project Snapshot

A grand project such as setting up a petrochemical complex relies strongly on efficient and robust project management of the best kind. LTHE's work on Reliance Industries J-3 Program has firmly established RIL as one of the world's most dominant refining and petrochemical companies and is a study on how superior project management can help deliver even the biggest, most complicated projects, with ease.

Nestled alongside the Gulf of Kutch, Jamnagar is home to Reliance Industries biggest capex investment in the petrochemical business – RIL's Jamnagar Refinery and Petrochemical Complex. After two expansions, the two refineries together amounted to world's largest refining and petrochemical complex in a single location.

A third expansion wave was incepted in the form of J-3 Expansion Project.

J-3 Expansion Project

World's largest Pet Coke Gasification Project	Largest Ethylene Cracker	Para-xylene unit
---	--------------------------	------------------

A synergetic collaboration between RIL and LTHE made this project possible. RIL's resolute vision and business acumen made for impeccable timing in its endeavors; LTHE's efforts were the prime mover that propelled this vision into reality. LTHE has played an integral role by adapting itself to methodologies and operational standards that qualify as the building blocks of such a mammoth project.

New capabilities and competencies developed

The Jamnagar phase 3 expansion project also resulted in capability enhancement and opportunities for competency development. During the entire course of project, LTHE stretched beyond its execution and operational capabilities by delivering monthly peak production quantities of

- 48,500 CuM of concreting
- 11,500 MT of structural erection works
- 1.54 Lakh IM of underground piping
- Over 900 km of E&I cabling

In the above ground piping, more than 6.7 lakh Inch Meter have been erected, 10 lakh Inch Meter have been tested and over 13 lakh Inch Meter of piping have been boxed up in a given month.

Magnitude of Work

Estimated Man-hour scope >300 million (as much as 14 times the man hours consumed to erect the Burj Khalifa)	Concreting Scope at 930,000 CuM (as much as 3 times the scope of Burj Khalifa)	Structural Steel Scope at 180,000 MT (as much as 25 times the scope of the Eiffel Tower)
Above and Underground Piping totaled to 13.1 Million IM (covering a distance of 2,431 km when laid down in a linear sequential manner.)	Electrical and Instrumentation cabling scope was exceedingly high at 12,389 km	



Senior Management Review at the project site



Mass tool box meeting to discuss key HSE issues at project site



RIL-J3 Expansion Project

Conquering Challenges

Mega projects such as J-3 inherently have a propensity to be challenging. The table below summarizes the main challenges and the innovative solutions LTHE used to overcome them.

The Challenge	LTHE's Solution
Human Resource Human resource is at the core of our professional undertakings and in case of J-3, the project management personnel played a key role. The gargantuan quantum of work and the associated resource mobilization and management was the foremost and fundamental challenge.	<ul style="list-style-type: none">• LTHE developed and operated a dedicated Human Resource Cell to conduct and coordinate pan-India recruitment drives.• 2,317 project management staff were mobilized.
Accessibility Highly complex plant layout with only 20% of total plot area available for construction operations was a challenge which was exacerbated by the limited crane and vehicular access.	<ul style="list-style-type: none">• LTHE successfully managed communications, maintaining cross-functional synergy among all stakeholders, and ensuring a high degree of clarity in responsibility sharing.
Motivation and Training A huge influx of human resources witnessed in the J-3 project required dedicated and prudent efforts management with special focus in areas such as welfare and motivation. With a majority of the project management staff being new, a well-thought out hiring strategy and a centrally controlled allocation team for mapping and positioning of key roles was key. A robust in-house training program focused on imparting necessary functional training, aimed at alignment and orienting the new recruits with the prevailing organizational, operational, professional and performance standards was another challenge.	<ul style="list-style-type: none">• A total of 33,371 hours were spent on functional training covering 75 different topics.• Frequent interactions with the leadership team were organized to counsel, motivate and identify emerging talent.• Annual sports events along with corporate retreats were organized for both the project management staff as well as their families, to keep them motivated.
Cross-functional Synergy and Managing Communication Managing communication, maintaining cross-functional synergy among all stakeholders and ensuring a high degree of clarity in responsibility sharing emerged as a huge challenge during the project. Right from understanding the project objectives and product deliverables to ascertaining the required levels of customer satisfaction, there were plenty of unidentified factors which demanded dedicated monitoring and feedback.	<ul style="list-style-type: none">• A Project Execution Plan was drafted, prior to work commencement, to exercise the required levels of controls over the execution process and other project management operations. This served as a guiding light throughout the life-cycle of the project.

The Challenge	LTHE's Solution
Ascertaining Skill Levels Sub-contractor and workmen management and ensuring required skill composition and competency levels was a major task.	<ul style="list-style-type: none">• 1,091 sub-contracting agencies were engaged in J-3 across 7 project sites.• A centrally-controlled team was appointed to coordinate and converge the efforts of different teams. This team also oversaw all activities pertaining to induction and gate pass creation process for each workmen and staff.• To ensure the required skill composition and competency levels, experienced project management staff assisted these teams to evaluate and validate the multi-disciplinary skills being mobilized. This ensured that we had the right men for the right jobs at the jobs.
Workmen Management While it was arduous to mobilize such a large workforce, managing this sea of people proved to be an even bigger challenge. At its peak, there were over 35,000 workmen with a sustained average of 30,000 observed over a period of 8 months. Operating, logistics and maintaining accommodation for such huge numbers every day, while ensuring smooth operations with no road-bumps was quite a task.	<ul style="list-style-type: none">• 250,000 workmen were mobilized, evaluated on their skills and underwent a pre-deployment HSE training, along with a work-at-height training during induction.• A traffic-marshall was appointed with each workmen vehicle to ensure incident-free travel.• LTHE received several accolades from RIL which confirmed its superior workmen and workmen camp management efforts.
Efficient Material Management Managing materials efficiently also proved to be a daunting task in the project management operations at J-3. Considering the mammoth project size, the entire program was composed of projects which were geographically distant from one another. There were other agencies besides LTHE operating within the same, or at different locations. RIL had centralized the operation and physical location of majority of deliverables such as auto re-bar shops, concrete batching plants, etc. Every item to be shifted required careful planning, in line with monthly plan requirements to ensure that it arrived Just-In-Time (JIT) for consumption.	<ul style="list-style-type: none">• Almost USD 2.8 Billion worth of material was handled, managed, consumed and accounted for during the 55-month program schedule.• A collaborative approach between LTHE and RIL ensured that project management processes were carried out with the required synergy and in tandem with the work executed by other agencies, while minimizing the impact on project management performance.

The Challenge

Mobilizing Agency and Ensuring Accountability

Keeping track of each mobilized agency and accounting for every single workman was challenging.

Ensuring HSE

With a huge workforce working on a project of a huge scale posed Health and Safety challenges too. HSE at J-3, not only proved to be an essential project performance indicator, but also a game changer.

LTHE's Solution

- A biometric system was installed, with 135 biometric readers at different locations. This system was mapped with government issued ID such as PAN and AADHAR Card and ensured smooth disbursement of wages and transparency in the process.
- With an aim to achieve and meet the standards and operating parameters, the J-3 project team ensured an optimum composition in workforce, maintaining a 50:1 Workmen to HSE Supervisor ratio.
- Initiatives such as management safety walk-arounds, weekly HSE Committee meetings, were key to achieving the required HSE performance standards and the conducive environment to drive a cultural transformation in HSE.

The Challenge

As International Operational Standards show incident rates as stringent as 0.95 (incident per million man-hours). This led to a shift in LTHE's perspective and reception of international level of HSE operation standards.

LTHE's Solution

- HSE credibility system became the essential feedback mechanism, helped in increasing individual accountability, and provided a tangible framework for identifying areas of concern and improvement.
- Toolbox talk (TBT), marquee announcement, HSE exhibition centers, periodic mass tool-box and crafts meetings, campaigns, flip charts and other such innovative HSE practices were deployed in an efficient and precise manner.
- Achieved a cumulative frequency rate for total incidents (TRC) of 0.50 against a benchmark of 0.95.
- LTHE also managed to clock 54 Million safe man-hours.

All these achievements in such a huge endeavor illustrate how superior project management with efficiency, innovation and workforce management at its core, can simplify and deliver quality projects with efficiency, irrespective of its size and inherent complexities.



World's Largest Refinery Off Gas Cracker