

A Study to Identify the Need of Technical Leadership Programs in an Engineering, Procurement & Construction (EPC) Organisation

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Abstract— The objective of this paper is to understand the need of Technology Development programmes required in an Engineering, Procurement & Construction (EPC) Organisation which will enable the organisation to differentiate themselves from similar organisations in the industry. Larsen & Toubro Limited through its Construction division, has been focussing on infrastructure development including areas of Power Transmission & Distribution (PT&D), in India and abroad. The PT&D organisation has been working in the areas of construction of Extra Heavy Voltage Substations (EHVSS), Transmission Lines (TL), Utility Power Distribution (UPD) and Solar systems, being the four verticals. As a Project Management Organisation, there is a strong focus on Time, Cost & Quality. A study was conducted to understand the business critical roles and the roles impact on the business. As part of the study the authors worked on the need to understand and develop the technical competencies of few of those critical functions / roles in the value stream which is the differentiating factor in this highly competitive industry. It also required to develop Technical Leadership Programs to enhance the talent requirements, including identifying the knowledge delivery partners, who will be training the employees, performing these critical roles. The pedagogy of this technology leadership programme is a combination of Experience, Exposure and training (70:20:10), as identified by the Centre of Creative Leadership. Thus the study reveals that, Technical Leadership Programme so planned has helped to improve the efficiency of the employees handling the critical roles.

Key words: Project Management, Critical Functions, Technical Development Programmes

I. INTRODUCTION

India one of the highest populous country in the world with more than 13.0 billion civilian populations, has been focussing on Infrastructure development predominantly in the areas of Transportation, Energy and petroleum

Sector	Number of Projects	Cumulative Expenditure (US\$)
Road Transport and Highways	91	8.7 billion
Power	73	16.63 billion
Petroleum	65	19.48 billion
Railways	33	3.81 billion
Steel	20	8.13 billion

Source: Ministry of Statistics and Programme Implementation (MoSPI), Govt. of India

Table 1: Summary of Infrastructure Projects Completed During the 12th Five Year Plan

Hence, there is a great opportunity and need for EPC companies to focus on these infrastructure verticals. Larsen & Toubro Construction an EPC arm of Larsen & Toubro Limited, a big engineering giant based out of India, had put

enormous focus on building the organisation capabilities to support the growth aspiration of the company in these areas.

The Power Transmission & Distribution (PT&D) is an industry / segment leader in the Electrical EPC business, with the following verticals as part of the business:

- 1) Extra Heavy Voltage Substations (EHVSS),
- 2) Transmission Lines (TL),
- 3) Utility Power Distribution (UPD) and
- 4) Solar projects

While there are many players in the Electrical EPC industry, L&T - PT&D has over a period of time created its own supremacy by focussing on building up the capabilities in Project Management by way of effective Time Management, Cost efficiency and best in class Quality standards. These being the differentiators in the EPC business, the availability of talent to handle the business and catapult it to the next level of growth path, was identified as a developmental area.

The leadership team analysed the critical roles in the value chain of project management, at various levels and functions, and came up with few critical roles and developmental interventions required for those roles. In the first phase the following critical operational roles which creates a phenomenal impact of the completion of projects in time, was taken up as part of the organisational effectiveness intervention, through lots of deliberation with the management team.

- 1) Planning Engineer (Planning efficiency)
- 2) Project Execution Manager (Operational efficiency)
- 3) Project Engineering Manager (Design efficiency)

These technical roles form the critical differentiators for the business and hence developing the employees handling these critical roles were decided to be quintessential. The authors being part of the Learning & Development team of PT&D, listed the various roles in the organisation and reviewed the roles directory for the organisation in conjunction with the value creation by these roles in operation, from the perspective of Time, Cost & Quality (Project Management Triangle).

A. Planning Engineers Development Program (NuEPC – Nurturing Excellence in Planning & Control)

Planning & scheduling is an important part of any project management function / activity. Efficient planning of construction activities aids the completion of project on time and within the budget in an EPC organisation. In PT&D, a need was felt by the Top Management to strengthen the Planning and Control related competencies among employees. Our engineers are to be enabled to think beyond their regular operational tasks and hence focus on the 4Cs: Cost control - Conversion – Completion – Collection. We had identified 200 project planning engineers who shall be trained and developed in this process, covering all business units. A comprehensive analysis was done to evidence the need of the programme.

The inputs were consolidated and a structured “NuEPC” programme was designed. To complement the journey of Executional Excellence. The pedagogy of the programme was finalised to be a combination of class room sessions through applied knowledge, followed by practical orientation Subject Matter Experts (SMEs) in PT&D. The program also included leadership talks on success stories in PT&D. Formal interactions between PT&D & IPM faculties were organized to help them structure the content of the sessions, and also enable them to create a sync between the session’s in-order to give the participants a business perspective and a practical orientation of the business we are into. The contents of the programme were further fine-tuned based on inputs received from the participants with the help of an E-survey done a week before the start of the programme.

A wholesome agenda was drawn, and the plan was to cover it in 2 modules spread over for 15 days.

Module – 1	Module – 2
Project Initiation & Planning for predictable performance	Quality & Safety for improving project acceptability
Scheduling practices for improving schedule performance	Stakeholders engagement for improving project success
Construction Monitoring & Control for improving project acceptability	Primavera Training (Project Management Software)
Risk Management for improving project success	Interdependent work packages
Financial Management for improving profits	Effective Negotiation & Conflict Management
Materials Management and predictable vendor performance	Contracts Management
Digitalization	Engineering Management

Real time cases of situations from PT&D business were developed and presented to the participants for study and analysis, with the help of the respective faculty. Interaction sessions with senior leadership team were organized during the programme, to highlight the criticality of their role in the success of the projects, and there by to the PT&D business.

To ensure effectiveness of learning Module-2 was done after a period of three months so that the planning engineers can implement the learnings in their workplace to have an experiential understanding in line with “Kolb’s Learning Cycle” model (Abstract Conceptualisation – Active Experimentation – Concrete Experience – Reflective Observation).

B. Project Leadership and Managerial Development Programme (PLMDP)

The success of the project is highly dependent on the efficiency of the manager who is handling it. The Project Execution Managers (PM) are the custodian of all processes pertaining to (projects) administration (POSDCoRB – Planning, Organising, Staffing, Directing, Coordinating, Reporting & Budgeting – by Luther Gulick and Lyndall Urwick). The role is very critical, as each project is a profit centre and the project manager being the CEO of the project.

While the project execution managers are well experienced in day to day operations, we wanted them to be high on Execution / Operational Excellence. Little different the Planning Engineers these Project Execution Managers come with a better understanding of all the operational requirements, required for timely completion, the challenge was to have them entrepreneurial capabilities to handle the project as its CEO. More so on handling the people, motivating them to achieve the stringent targets / schedules and cost efficiency in managing the working capital and operational expenses. To make them understand the “WHY” portion of the projects management and “HOW” it is connected to the larger organisational goals, we had to come up with this developmental intervention. The objective of the program to enable the project execution managers to come with a broader outlook of project management and act as an orbit changing visionary leader, with required entrepreneurial mind set.

Similar analysis as mentioned above were conducted to come up with the following agenda for the programme:

Sessions by PT&D - SMEs	Sessions by Knowledge partners
Behaviour Based Safety	Employee Engagement
Engineering Management	Motivation and Leadership
Indirect Taxes & impact of GST	Project Management (Gamification)
Excellence in Project Execution: Overseas Projects	Influencing & Negotiation
Data Analytics and Decision Making	Macro-Economics
Corporate Governance	Fiscal and Monetary Policy
Application of Digitalization in Projects	Competitor Analysis
Project Cost Efficiency and Cost Control	Understanding Financial Statements
Supply Chain Management	Analysis of Financial Performance
Tendering and Contracts	Resource Management

C. Project Engineering Managers Program (SPEED - Special Programme on Excellence in Engineering and Design Management)

The Engineering Design & Research Centre (EDRC) department forms the neuro system of the PT&D IC. They are connected with the business throughout the lifecycle of the project management, from the proposal stage to the final stage of testing & commissioning, and also beyond in some areas where the Operations & Maintenance is part of the scope of the contract. The pinnacle of success of the EDRC team is the focussed approach towards achieving “Quality by Design”. While the functional heads bring in-depth understanding the midlevel managers in the EDRC teams – Project Engineering Managers (PEM) play a pivotal role in getting the seamless support for all the functional teams in the organisation from the business development teams to the operations team. This integration is quintessential for the projects getting completed within the time, cost and quality.

Hence, this role of Project Engineering Managers (PEM) becomes one of the critical functions for us to work on competency development.

In this context a core team was formed to list down the developmental areas for this roles. The team after talking to various stakeholders who are working very closely with the PEMs, came up with the focus areas, as detailed below:

Focus areas of Training
Project Engineering Management
Engineering Schedule, Performance Monitoring & Control
Supply Chain Management
Interface Management
Change Management
Risk Management
Project Close-Out

The L&T Institute of Project Management (IPM) who helped us in the FGDs also have been identified as Knowledge Delivery Partners. The pilot program was proposed to be conducted for the PEMs handling EHV Substation business, for a period in 6 days. Each and every session feedback was taken and consolidated, for corrective action and improvement prospects.

For all the above developmental programs interventions, specifically focusing on the three critical roles, following were the modus operandi for data collection and Interviews of identified employees were conducted to map their present level of competencies through a structured questionnaire by an expert panel with an objective of identifying the competency gaps vis-a-vis the target level of competency.

Focus Group Discussion (FGD) with select employees was scheduled to elicit in-depth thought and discussion. The interaction helped in brainstorming with the participants to understand real time issues in their functional areas.

Site visits were organized for knowledge delivery partners – L&T Institute of Project Management (IPM) to help them comprehend the PT&D way of working.

II. CONCLUSION

The above Technical Leadership programs were rolled out and the feedback was found to be very good. Based on the feedback from the pilot projects the inputs were incorporated and improvised in the subsequent / repeat programs. The employees who attended the programs highly appreciated the content and the methodology of these programs, as mentioned in the was evident from the feedback received at the end of the development program (Level 1 – Reaction, as per Kirkpatrick’s Model of Training Evaluation). The authors along with the knowledge partners after the completion of two quarters conducted a survey to understand the effectiveness of the implementation of the learnings (Level 2, 3 & 4 – Learning, Behaviour / Training transfer & Results of the said model). The outcome was encouraging not only from the employees, and also from their supervisors who acknowledged there is a positive shift in the efficiency of most of the employees. This inputs were shared with the PT&D Management in different forums. Hence, the management advised the Learning & Development team to

ensure the programs are rolled for all the employees handling these roles in the organisation. The team enabled conducting of more such repeat programs and the outcomes are regularly being monitored by all the concerned stake holders.

The challenges in the process was the time taken in conducting the FGDs, delay in teams travelling to the sites to understand the way of working of these role holders and identifying the right knowledge partners. However, with continued focus and support of the management team, all these challenges were overcome. Now the team has completed multiple programs and set the right standards for the continuous technical knowledge upgradation of this critical roles / employees. L&T and PT&D organisation commitment towards continuous development of technical competencies has started reaping the benefits of performance enhancement by the participant employees, and has also become a successful business proposition.

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