IPM Prism
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L&T INSTITUTE OF PROJECT MANAGEMENT
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# Power of Project Planning


## Project Timeline




## Other Key Updates/Notes

- Project progress in on track.
- Resource plan is intact.
- Business requirements approved.
- PM on leave for 2 weeks.
- New resource is on-board.
- Public holiday on 12th Sep.


# From the Editor's Desk



IPM PRISM is a quarterly publication of L&T Institute of Project Management. IPM can be seen as a PRISM that converts the white light of L&T experiences in executing complex domestic & international projects and adopted global best practices into structured programmes for participants to learn the various aspects of project management signified by the colours generated by the PRISM

*Please send your valuable suggestions & comments to* – **info@lntipm.org**

We endeavour to set higher benchmark for each PRISM edition and with constant support of contributing authors, we are able to move in that direction.

In Projects, it is important to begin with the end in the mind, because all the planned profits may get eroded, if the project close out is not effective. In this edition, we are happy to share with you a project success story from L&T Hydrocarbon engineering which followed the mantra of effective closeout helped LTHE in successfully completing of project 6 months ahead of schedule.

We are thankful to Mr. Sriram Ayyar for capturing the digital initiatives of L&T Hydrocarbon engineering and sharing the challenges during implementation and the benefits accrued to the project.

We appreciate support of IPM Faculty, Dr. Hiren Maniar, Prof. Reghunath and Prof Sunil Kumar for their contributions to the Faculty Column in their area of Expertise on Finance, Planning and Site Management. Since the invention of the printing press, books has been the means of knowledge propagation to larger masses in quick time leading to changes and innovation. We thank Prof. VTCS Rao & Prof. Sunil kumar for sharing the highlights of the books, which is very relevant in today's environment. Programme Panorama captures the width and depth of the IPM Programmes, bringing to you the multiple dimensions of Project management, which every project manager should possess to survive in this competitive environment. World of webinars stands as a testimony of IPM's Motto "To Stay Connected" with distant geographies like Egypt, Algeria, Morocco etc .

This Quarter is planned with an array of Flagship Programmes, SCDMs and Webinars encompassing all tiers of employees, we request readers to look into the calendar section and plan the quarter ahead.

## Features

# Dean's Desk

**V.T. Chandra Sekhar Rao**
Dean - L&T IPM

## Power of Project Planning – Key Principles Clarified

Planning provides the foundation for all other management actions. In project planning phase plans are documented, the deliverables and requirements are defined, and the schedule is created as per committed scope. Knowing what is required, who is to perform certain tasks, how they are to be performed, and when the events should be scheduled allows managers to organize their activities in a more efficient manner. Moreover effective project plans help in managing time, cost, quality, changes, risk, and related issues. Inherent in the planning function is the need for monitoring and control. With the plan's implementation, feedback is obtained relative to progress in objective and goal completion. Evaluation of actual compared to planned figures permits the manager to assess progress objectively, to make necessary adjustments to the master plan and to take corrective action for ongoing operations.

Having said that, "Planning" is one of the most talked about topic and least meticulously practiced one. Adding agony, most people consider scheduling is planning, which is often an honest false belief. In this edition of PRISM, I would like to clarify a few points so that misconceptions about planning are cleared off and Power of Planning is well understood. We cover more details in our flagship programmes and SCDMs (Specific Competency Development Modules).

In any project, planning is a continual phenomenon as it gets more detailed during progress of project in overlapping EPC Phases. The overlaps are in Initiating, planning, engineering-procurement, execution, monitoring & control, construction and commissioning and closing processes phases. The relative progress of Engineering and construction are depicted in figure 1.

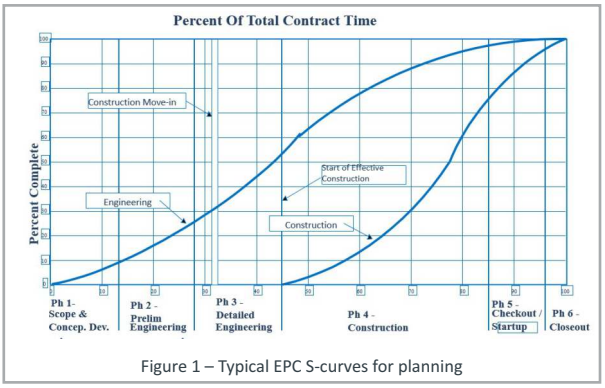



Figure 1 – Typical EPC S-curves for planning

**The following are the six significant topics of planning that I would like to demystify and clarify.**

### 1. Pre-project Planning:

Project success depends on how much amount of pre-project planning went into before bidding for an EPC. The focus during bidding is correct pricing and right evaluation of risks and opportunities to be competitive in bidding. Pricing is largely dependent on your global supply and sourcing strategies to get the best price for products and services for a particular project, at a particular location. The technologies like modularization may help to overcome challenges of limited labour resources at a location. Planning consists on project execution planning elements for schedule, cost, contracts, risks, quality at pre-planning stage, supplemented by communication plan, stakeholder engagement plan, post-project procurement strategies, planning for value creation, deeper quality plans for Site Quality control etc. Planning does not mean preparing a Primavera/ MS project schedule. One of the key aspect of pre-project planning is to assess how well the project scope is defined and what strategies to employ to cover risks related poor scope definition and inequitable contract provisions.

### 2. Strategies that form the basis for planning:

Strategies form the basis for execution plan and thus for preparing detailed project schedules and pricing. The strategies then lead to appropriate WBS and CBS. Few strategies for example are

- Supply Chain Strategy
- Sub-contracting Strategy
- Multi-location Engineering Strategy
- Construction Execution Strategy
- Re-work reduction strategy

## 3. Project Baseline and Change Management:

We often misunderstand project Baseline is limited to schedule and cost. But there are other elements. Establishing all these baselines is important to track changes to the baseline and also approach compensation when these changes are directed or constructive. A complete baseline for the project will be

- Contract–Scope of Services and Scope of Facilities
- Schedule Baseline
- Cost Baseline
- Risk Baseline (as perceived at time of bidding)
- Execution Plan (Ex: One might have planned for open excavation for foundation, later on discovered we need sheet piling due to an adjacent site)

## 4. Levels of Schedule:

During my interactions in a capability programmes, one of the planning managers said they do planning up-to Level 8 or 9. I was surprised as his project is sub 150 crores and a straight forward project, but on questioning I realised he was talking about WBS level, not Level of Schedule. As Per AACE 37R-06, essential levels for execution that need to be covered using MSP or P6 are :

**Level 1:** Management Schedule which has bars of major project activities (like E,P,C) and key project milestones that management is interested to periodically look into.

**Level 2:** Each Component is further sub-divided to cover complete scope. Sometimes it is called Project Coordinate Schedule showing enough details on major interfaces.

**Level 3:** Should be consisting of CPM schedule for Engineering, procurement and construction and integrate them at appropriate levels. This is often the baseline schedule for the project.

**Level 4:** Control Level Schedule: Generally, segment of Baseline schedule, further elaborated to have control at a functional or discipline level.

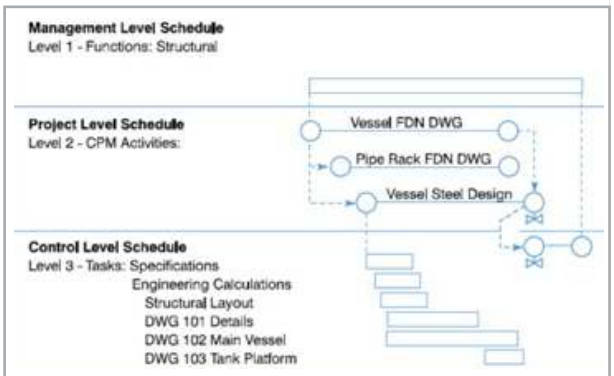


Figure 2 – Levels of Schedule

The levels can be grow if the programmes or project has more projects with-in to be integrated.

## 5. Organisational Processes and Governance for Powerful Planning:

Every company needs to standardise their SOPs, with flexibility to generate project level procedures to suit a country context or project context. Few suggested OPs are

- Planning and project control guidelines
- Guidelines for updating the schedules and revision control of schedules
- Guidelines for establishing project baselines (beyond ACE as mentioned earlier)

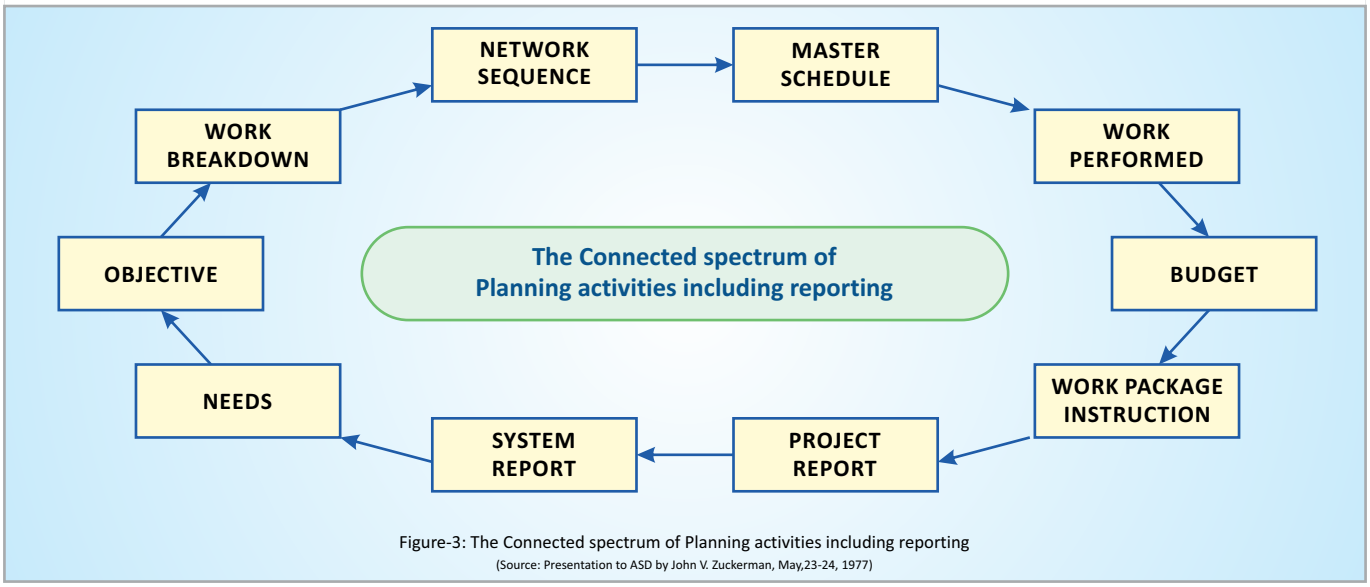


Figure-3: The Connected spectrum of Planning activities including reporting
(Source: Presentation to ASD by John V. Zuckerman, May,23-24, 1977)

- IC's Estimating Guidelines
- Standard Change Management Procedure and Definitions
- Cost Reporting Standards
- Guidelines for Managing Contingencies
- Guidelines/ Minimum requirements for Trending, Analysis and forecasting, etc

On Governance, I find much is desired on the depth of auditing/ reviewing the Planning function (Project Control function). We need to establish the minimum performance expectation from planning, especially in Trending, analysing and forecasting for costs as well as schedules. Inter-discipline review of the first EPC schedule and subsequent major changes should be made mandatory. Forensic schedule analysis should be done by a non-project person to look in incorrect logics and links. Internal Planning Audits should review entire connected spectrum of planning/ Project controls as depicted in figure 3.

## 6. Decision-Making in Project Planning:

Decision making as a key component of the management function of directing is significant and critical to project success. A cardinal factor which impacts decision making is the amount of uncertainty which exists in the project environment. This uncertainty variable often leads managers to delay decisions, which is a decision in and of itself. Such inaction in a dynamic environment can lead to problems which can affect project success. Thus, there is a need for project managers to understand uncertainty and how to cope with it in the project environment.

Uncertainty can exist in many forms in the internal and external environments of the project. It is a multidimensional concept. For example, decision-makers deal with business, financial, project, environmental, and other types of uncertainty; however, three basic concerns emerge in this area for the project manager. The individual is concerned with cost, schedule, and performance or technical uncertainty.

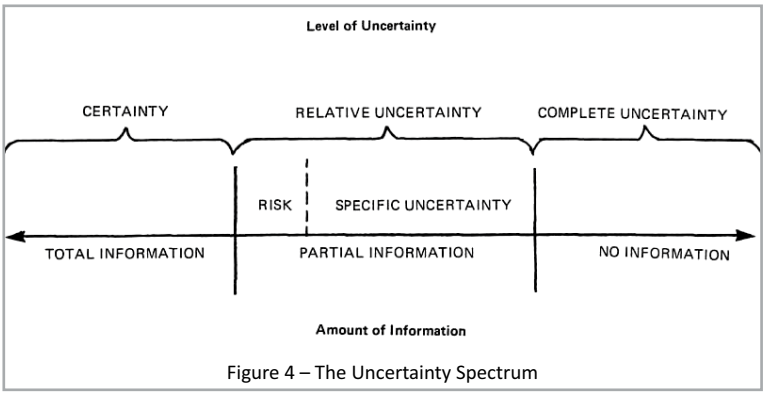


Figure 4 – The Uncertainty Spectrum

In the planning process the cost of various alternative strategies are evaluated and the strategy is selected based on low-cost and other quantitative factors. These costs, however, are estimates which may be erroneous. Inflation, high interest rates, labour strikes, material shortages, and other environmental variables may affect costs. The acquisition of valid and accurate information will reduce cost uncertainty and avoid cost overruns. Since perfect information is never available, the planner can use sensitivity analyses to determine the degree of error that his project can survive. In doing so he identifies the range of the uncertainty spectrum in which he must operate. If he cannot acquire sufficient information at reasonable cost, he should reassess his total plan. We teach this aspect in IPM's Risk Management Specific Competency Development Modules.

Networking and schedules deal with the sequence of events and their timing. The development of these time estimates occurs in the same environment of uncertainty as the cost estimates. The project manager is dealing with the future events whose timing can be impacted by any number of factors, such as labor strikes, supply or equipment non-availability. A properly done schedule will be helpful to carrying Time-Impact Analysis whenever such an event happens. Then do a cost-benefit analysis to decide whether accelerating the remaining work is beneficial or raising an EOT claim is beneficial in a situation.

Decision making in planning also is complicated by multiple constraints arising from the internal and external environments. Internal limitations involve budgetary matters, such as funds to pay personnel and procure supplies, equipment and other resources. Adequate planning will aid in the identification of these limitations and the subsequent trade-offs between resource categories to insure project success. External variables as mentioned before cannot generally be controlled by the project manager; however, they must be identified to be influenced and accommodated. These variables include top management policies, environmental changes stemming from political and legislative actions, the strategies of competitors, and the vagaries of the market place.

## Summary

Planning provides a nexus between the managerial functions required to activate a project and the elements needed for a successful project completion. It is concerned with deciding in advance what, when, how and who will take the necessary actions to accomplish established objectives. This paper has examined few areas of planning which are often misunderstood or not taken care at project level. Project managers seeking success should master these concepts.

# Deep Dive into Digitalization

## Adding a digital edge to EPCC Projects: Perspectives & Challenges

**Mr. Sriram Ayyar**
Head - Project Controls & Digitalisation (Onshore Projects)
L&T Hydrocarbon Engineering Limited, Vadodara, India.

The 4th Industrial Revolution is well underway, and we are witnessing one of the most disruptive phases in our world's history.Riding on the wave of innovations and technological breakthroughs that have incubated over the past few decades, "Digitalization" is the new imperative – there are indeed very few facets of business and life that are as yet unaffected.

At L&T and LTHE, we are in advanced stages of implementing several digital initiatives that will potentially leapfrog us into leadership positions in our various industry segments, and at the same time enhance our employees' ability to deliver value in their respective roles: better, faster, & with greater assurance. A few examples:

| Aspect | Initiatives | Impact / Business Benefit |
|---|---|---|
| Data Acquisition / Digitisation | Converting conventional non-digital processes to digital data at source. E.g. point-of-transaction data capture using mobile devices, RFID, QR/Barcode, Scan+OCR of unavoidable paper processes, Laser/Ultrasound Scanning, Digital NDT records, application of IoT to tools & machinery | Faster & more accurate data capture; Improved project visibility through comprehensive digital footprint covering essential business processes including hitherto un-measured parameters; This layer enables higher level digitization aspects like analytics, RPA, etc. |
| Automation, Productivity & Utilisation Enhancements | Focus on improvement user interface / experience on repeatable tasks, or tasks requiring high precision / control, RPA, robotic / digitally assisted construction / fabrication processes, collaborative digital work spaces for geographically separated teams including use of 4D planning, AR/VR | Reduced non-value-add (NVA) time, improved speed, accuracy and time-on-tools at various work-faces, proactively enhances HSE performance |
| Systems & Workflow Integration | Integrated / Enterprise-wide Project Management System; Consolidation & upgrade of legacy IT-enablement systems; Enhanced and comprehensive material codification to have a unique digital identity for procured items | Coherent, consistent, near-real-time decision-support information delivered via contextual role-based dashboards, Improved transparency and visibility of the project status and issues; integrated tracking of material and work-front across E, P, C/F |

| Aspect | Initiatives | Impact / Business Benefit |
|---|---|---|
| Analytics, Cognitive, & Artificial Intelligence | Based on the wealth of coherent information available across essential project life cycle processes, analytics to optimise procurement spend, balance risk vs opportunity, gather knowledge across the organisation and provide expert advisory systems (cognitive), and AI-based diagnostics & solutions to complex real-life project problems | Enables leaner and less-experienced teams to deliver larger and more complex projects. Frees up the time of planners and key functionaries from manually processing data, compiling and analysing information and focus on performing informed action or performing course-corrections based on the impact of their actions |
| Mobility & Information on Demand | Material tracking through Barcode on mobile, mobile-based update of Construction deliverables; mobile interface for transactional systems and senior management MIS | Near-real-time data updates on site/shop progress; greater transparency and visibility; Improved utilization of Senior Management bandwidth |

While many from the above table are in various stages of implementation, the benefits are already evident – The combined impact of these, when completed, implemented will potentially provide huge differentiators: Shorter delivery schedules, cost competitiveness, better business assurance, among others.

EPC projects as a segment has historically lagged other industry segments in digitalisation, and while it is fast catching up, will continue to lag other segments for many years. There have been several challenges during implementation, arising out of a combination of:

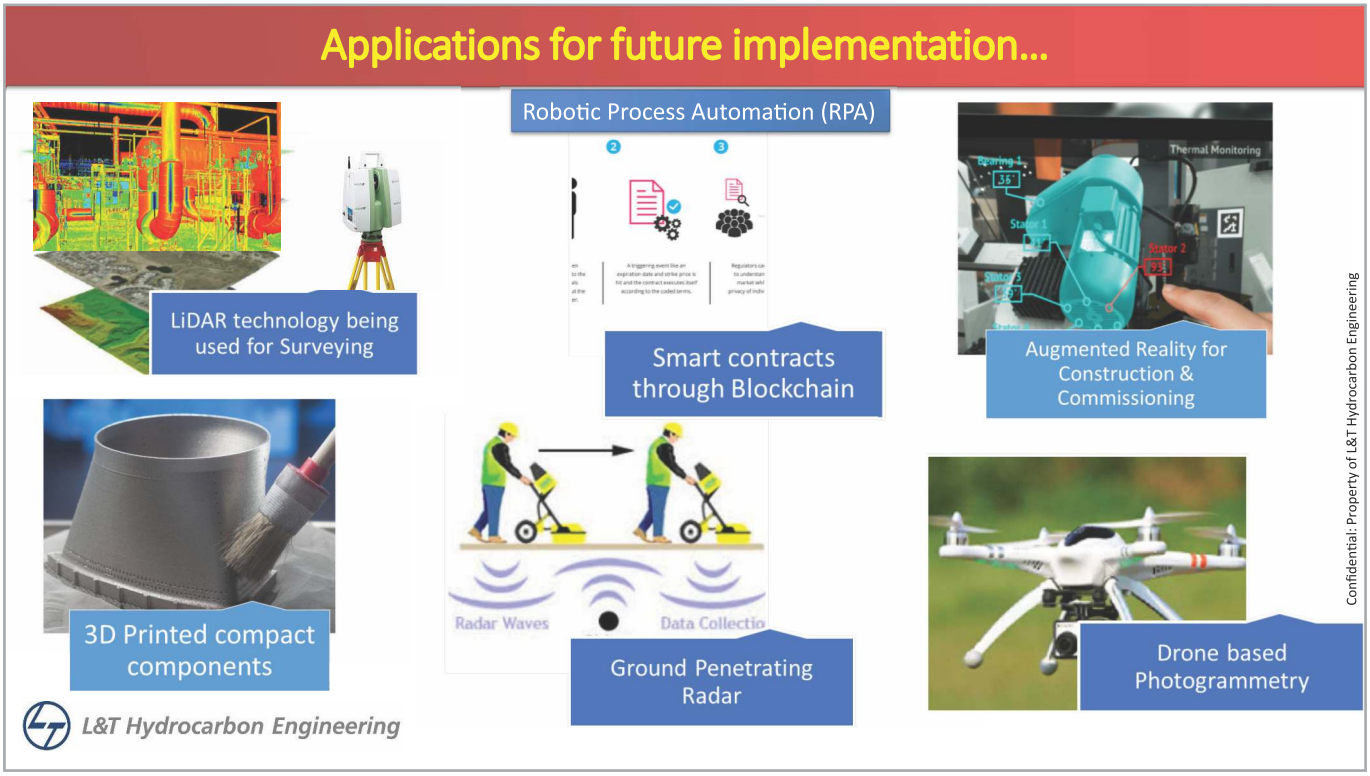
- Client's refusal to allow digital equipment in the plant area.
- Poor data connectivity at sites (poor signals, especially in areas surrounded by steel/concrete).
- Large number of unskilled/semi-skilled labour and multiple, un-synchronised contractors at site.
- Existing, but hugely fragmented legacy business applications – many gaps & overlaps

However, these can be, and are being addressed at several levels. While the implementations may be complex, the entire programme is being designed with a focus on improving User Experience for all stakeholders, resulting in better adoption.

In fact, the biggest challenge is not just about embracing new technology, it is about a change in mind-sets and work culture.Those who have lived through a new software implementation process or a TQM project will testify to the challenges faced merely due to user-resistance to change. The magnitude and complexities that many such parallel, and often unsynchronised changes across the organisation and involving multiple external parties can only be imagined.

In order to mitigate the risks associated with such rapid change for all stakeholders a change management specialist is working with the various implementation teams to pro-actively mitigate many of these risks through proactive communication and timely interventions like user training.

We are now in an era where businesses will need to pursue innovation to disrupt their own business model before the competition does, and do so in a way that would be difficult to emulate. At LTHE, we believe we have built the right frameworks and foundation in this direction, and the Big Digital Revolution is just around the corner.



# Pages from Project Success Stories

## Smart, Synergised and Fast-Tracked Engineering & Commissioning to secure early completion

### (Presented by Mr. Shankar, Mr. Aravind & Mr. Prince Walter LTHE)

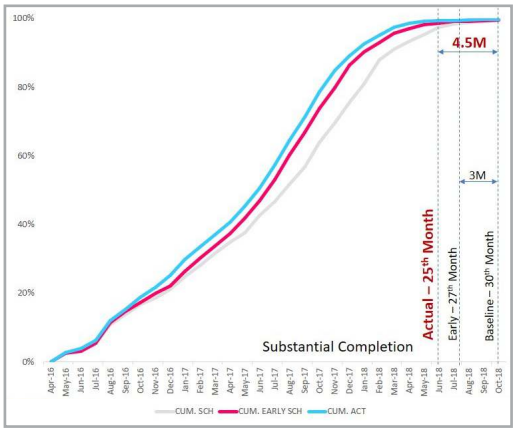
**This project is a theme winner under the themes, "Engineering = Mending Creativity and Cost Effectiveness (E=MC2) and Effective Closeout - Commissioning & Startup of CEPM Conclave 2019.**

> *To crash a project, we will have to focus on all fronts starting from Engineering, Procurement, construction and commissioning.*
>
> **- SNDC & KDC Project Team**

The client for the project is Petroleum Development Oman (PDO), which is the leading exploration and production company in the Sultanate of Oman. During 2016, the client faced serious production issue due to the declining reservoir pressure which impacted the inlet pressure at the facility. To mitigate the situation, an additional Depletion Compression was planned at the Saih Nihaydah & Kauther Fields. These 2 sites contribute around 25% of the nation's gas production. The project duration depended on the critical component like compressor whose manufacturing and delivering time was around 21 months. The other project activities like ordering, Pre–Commissioning and startup will typically take 3-4 months each making the project duration to be around 32 months. Obviously the client could not afford the long duration, as the Depletion of the gas happened much faster than anticipated by PDO. The situation become more challengingdue to the forward contracts it had signed with the European customers till 2021 which mandated that PDO has to supply gas at the rate agreed as per the contract. But due to the declining reserves the supply will not be sufficient to meet the demand, hence to compensate the gap in the supply, the client will be forced to buy gas from the neighboring countries like Qatar at a higher rate, which would result billions of dollar loss for the company. To avoid this huge loss, the client was ready to provide an early completion bonus of 11.3 Million US Dollars (around 80 crores in Indian rupees), if the project can be completed by 27 months. L&T management decided to take up this challenge as a strategic initiative and make the most out of this opportunity. This project success story brings out the various ways in which the project team planned their activities to achieve a challenging target.

### Challenges in Accelerating Project Delivery

- 54 successive technical safety studies with PDO operation and commissioning team participation in the 3Dmodel & other safety study reviews and managing their expectations.
- Adherence to PDO project specifications, Shell DEPs and special studies comments closure (1100 nos/ project subsequent design freeze to avoid design changes / rework at the site.
- Brown field design freeze to meet the narrow shut down tie in window(14 days for each project and 1300 USD/hour penalty in case of delay in execution),Piping advance tie-ins (72 nos. in SNDC2, 52 nos. in KDC2) and E&I tie-ins with existing facilities and with other contractors.
- 15 parallel projects in SNDC & 17 parallel projects in KDC to be aligned for design integration.
- Delivery of RCC, steel, building drawings and piping isometrics in order to meet the accelerated schedule. Continuous front release and zero rework at Site.
- Past Projects faced issues on equipment preservation, vendor support at site, Start-up, addressing Audit observations, PSU Audit.
- Closeout to Startup takes more than 2 months based experience from previous executed projects in PDO.



*The past experience played a key role in taking judgmental calls and make the project proceed. The team distinguished the areas in which they needed accurate data and areas in which they can proceed with judgment. It turned out in 80% of the cases, we were able proceed with judgmental decisions with little work around.*

**- SNDC & KDC Project Team**

| Engineering Strategies | | |
|---|---|---|
| **Schedule Acceleration** | **Execution** | **Brown Field Design** |
| Critical path activities identified, accelerated and monitored | Timely identification of interfaces, Interfaces weekly meetings and Road show for interface management | Engineering Site visits prior to design start |
| Concurrent design approach followed with sound technical judgement based on past PDO project knowledge and vendor data | Cross function inputs and outputs to other contractors, Vendor visits to design office for critical document closure | Actual site measurements achieved before IFC issuance |
| Arrange design input through UG Scanning, Slit trenching and Field Engineering | Multiple site visit and site engineering | Multiple Tie-in workshops with Construction and Commissioning teams |
| Deputation of Design Engineer at site permanently | VDR module, IFIR module, Accelerated closure of Special Studies | UG Scanning and Slit Trenching for unknown areas |

### Strategies for Early Commissioning

Based on the Past experience, it was observed that the commissioning always starts late and it was decided to do more Construction & Commissioning activities in parallel by taking the below initiatives

- Advancing Compressor delivery by 3 months
- Early mobilization of Construction team and Commissioning Team
- Finalization of Systemization and their Pre-commissioning sequence early in the Project
- Well-coordinated SIMOPS
- Flawless Project Delivery
- Zero PSUA observations

| Flawless Project Delivery (FPD) | Zero PSUA Observations |
|---|---|
| Management support to mobilize Commissioning Engineers much earlier, which helped in identifying flaws during the design phase and creating a robust flaw list. | Comprehensive list of learnings & Audit actions of previous projects |
| Systematically mitigated flaws through the early completion targets without compromise | Action points identified which covered all the 3 phases and identified action parties from both sides for bringing accountability |
| Material kept unpreserved posed a serious threat for timely completion, which was overcome by identifying focal points for preservation with dedicated Q captains | Evidence based close out |
| Customized Checklist prepared from ordering, covering, Manufacturing, Dispatching and Site Storage | Site walk downs with the client to bring in transparency with a motto "One Team One Goal" |

Typically engineering teams are conservative and keep a cushion and they become bit extra safe while finalizing the design. If the project manager is able to instil the confidence that –

*We are together and we will share the consequences of anything good or bad.*

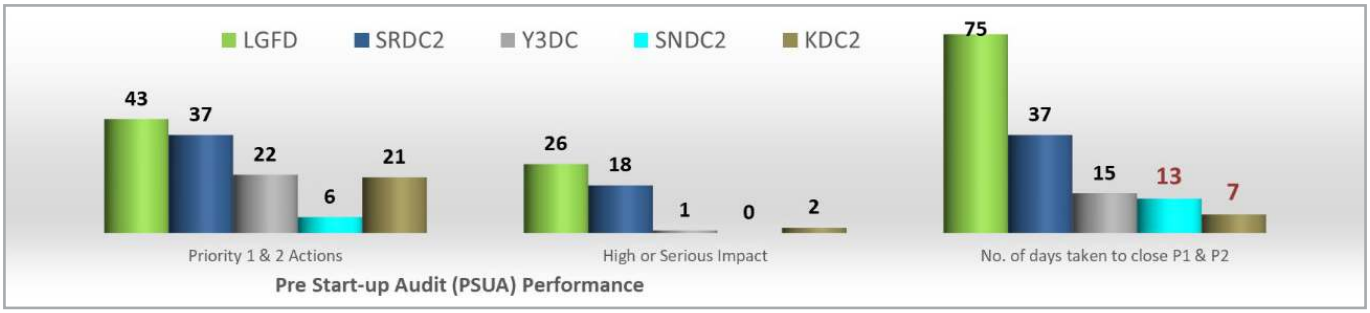
It becomes morale booster and actually it works wonders

**- SNDC & KDC Project Team**

*One of the key success factors was that the end baton holders, the commissioning team was roped in early in the project and this ensured that the commissioning team conceptualized how the entire plant to be constructed and handed over. This meant that the entire scope of the project was divided into pre commissioning entity called the subsystem. A system composed of many sub system and prioritization was made at the subsystem level.*

**- SNDC & KDC Project Team**

## Pre Start-up Audit (PSUA) Performance comparison among PDO Projects




## Project Achievements

Substation charged 3 months early than baseline schedule, Piping isometric issuance completed 4 months early than baseline schedule and piping work volume optimized by 5%, 3.5 Months Acceleration in Structural drawing release w.r.t base line plan and no rework /modification at Site and 13% quantity reduction in RCC and 20% in Steel, Plant made ready for Pre-start up audit (by Client) by 3 months in advance in SNDC and 5 months in advance for KDC2, Piping Tie-ins completed successfully (almost 2 days in advance) without any modifications in pre-fabricated spools, Zero incidence due to engineering error at site.

## Lesson Learnt

- Implementation of lessons learnt right from start results in Safe, Smooth & Swift start-up.
- Evidence based Close-out of flaws brings in a high level of thoroughness and accountability.
- Transparent approach on flaw resolution improves client participation & goodwill.
- Cold eye review through regular audits brings in a proactive problem resolving approach.
- Commissioning members from project start gives Commissioning driven Project Execution.

*Complied By:*
**Prof. K P Reghunath**
**Prof. Sunil Kumar**

*A project of this scale requires a commissioning period of 4 months, which was not an affordable luxury in the project context because of which construction and commissioning has to overlap for a significant period. For a 27 months project, a 3 months of overlapping was required. It was a challenge in having the charge up lines, cable line with chemicals and construction activity like welding, civil and structural activities happening in parallel, hence a very well-coordinated SIMOPS (simultaneous operations) was defined with a checklist with who is authorized to provide required permissions.*

**- SNDC & KDC Project Team**

# Caution & Care for Cash Flow Planning in Projects

**Dr. Hiren Maniar, Faculty, L&T IPM**

The Cash flow is the lifeblood of any projects. Ability to manage cash flows throughout the project life cycle can be the defining factor between the success and failure of any projects. Investing in a new project requires cash, and the construction companies must decide whether the project will be a good use of its precious cash. Just as project managers ensure the availability of project team members, materials or equipment required for the tasks, they must also ensure the project cash flow. In today's competitive world merely targeting profit margins is not sufficient for maximising returns and minimising risk but simultaneously requires a sound understanding of cash flows impacting project performance.

For any projects if profits are good but cash flows are not, it could be that projects are not collecting receivables quickly enough or they are struggling with repayment of loans or borrowings, or even worse, it can also be an indication of exaggerating sales figures. Financially well-run projects should have an improving cash position at the end of every month rather than every quarter or year. It is essential to check cash flow position month on month, at the end of every quarter to identify and fix problems.

## Caution of Cash flows or Liquidity Problems in Projects

Probable symptoms of cash flows or liquidity problems in projects are as follows:

- Constant declining of monthly or quarterly cash inflows.
- Shrinking of profitability and operating cash flows along with increasing project cost that the project firm is unable to pass on to the customers.
- Unexpected and prolonged building of accounts receivable or collections.
- Unexpected and prolonged build-up of project inventory.
- Declining of projects' net working capital, current ratio or an increase in its short-term and total debt ratios (Short term Debt/ Total Assets and Total Debt/ Total Assets).
- Deceleration of project liquidity or cash crunch situations.
- Sudden increment of short-term borrowings.
- Unfavorable currency fluctuations and commodity volatility which increases project cost in the event of non-execution of hedging or escalation provision or price variation clause with vendors/suppliers.

## Care of Cash flows in Projects

Suggested steps for effective and smart cash flow management in projects:

- Smart study of project bidding document to ensure favorable payment terms and price variation/ reimbursement clauses in the contract.
- Careful drafting and negotiating of billing schedules for engineering, construction and supplies during the post award stage.
- Checking for the matching the vendor payment terms with customer payment terms as far as possible.
- Ensuring of timely invoicing and raising of all price variation and reimbursement claims.
- Proficient accounts receivable management through rigorous and continuous follow up for payment collection
- Effective liquidity and cash Management helps in timely collection and disbursement of cash and any temporary investment of cash while it resides with the firm
- Sound Inventory Management helps in maintaining optimum levels of inventory which should be neither be too low to affect the project adversely nor too high to block the funds unnecessarily
- Suitable accounts payable management will provide an opportunity to trade-off between cost of early payment and benefits like favorable discount and early delivery from vendors/suppliers

Hence the bottom-line is that construction companies operate differently from most businesses because every project is unique, therefore, construction companies should adopt different strategies to manage their cash flows, and the following 7-step strategy should be adopted for smart and efficient cash flows management.

- Understanding Client: It is highly essential to know your client from their ability to financial supporting projects and paying for the work performed.
- Accurate Project Estimate: It is desirable to have an accurate estimation of cost and profits for the projects which can ensure sound liquidity and profit for business.
- Meticulous Cash flow Projections: Create a reasonable cash flow projection during bidding stage along with monitoring of actual cash flows during execution stage this should help in managing and monitoring NCF along with measuring its impact on project performance.
- Finalisation of Favourable Contract Terms: Smart crafting of payment terms and schedule with vendors. Suppliers and client.
- Rigorous Follow-up in Collection or Receivables: Preferably collection period should be minimum and lesser pending receivables. This could be achieved with timely invoicing and sound documentation along with reconciliation and inspection from project stakeholders.
- Change Orders Execution: In projects, change orders can have a big impact on cash flow so it's important to know what can and can't be charged for projects. It is important that change management mechanism should be clearly established in the project contract.
- Effective Project Close-Out: Effectively managing the final punch list can improve the timeliness of the final payment and decreases the final retention.

# Significance of Site Visit & Assessment for a Construction Project

**Prof. Sunil Kumar, Faculty, L&T IPM**

| Common Project Scenario | | |
|---|---|---|
| "Assuming soft soil, as reported in the preliminary investigation, we entered in rate contract with vendor considering the productivity for pipe line project. Initial 50 km were fine but afterwards we found hard rock and productivity dipped. Sub-contractor is not ready to work at this rate, our ACE does not have scope for more……." | "Contract clearly mentioned construction power and water shall be provided by the client at one point ason availablebasis. However, after getting the connection from local distribution we found availability of power is very poor. It is available only for 4-5 hrs during night time. For water connection, the client has given an open stream located 800 metres form site at level difference of 100 meters…" | "Area of labour colony which was in client scope, was provided at the nearby hillock which is very difficult to approach and develop. Even transport to and from the plant is difficult." |

Above problems are not uncommon but project professional come across these on regular basis, project after project. What has gone wrong in these cases? The answer is Site Investigation, not done or not done well.

The knowledge about the site plays a vital role in the safe and economicaldevelopment of a site and completion of a project in all aspect i.e. Time, cost and scope. A thorough investigation of the site is an essential preliminary of any construction project. However, in most casesit has been observed that project executive often untrained / in experienced is sent to the site who goes there to meet the customer, have a look of site and nearby area, take photographs and return. Does this visit serve the purpose of Site Investigation?No. Site visit must be carried out by a of professional expert(s)in the area of design, logistics and construction with clear objectives, also this is to be consistent with SOP & Checklists established for a particular IC.

### Objectives of Site Investigation

- Toassess the general suitability of the site and achieve safe and economical design
- To assess local challenges & constraints to execute the work.
- To foresee and provide provisions against difficulties that may arise during construction due to ground and other local conditions.
- To find out the sources of construction material and selection of sites for disposal of water or surplus material.

- To investigate the occurrence or causes of all natural and man-made changes in conditions and the results arising from such changes.
- To ensure the safety of surrounding existing structures and also assess impact on design.
- To design for the failed structures or remedial measures for the structures deemed to be unsafe.

A separate geotechnical investigation is often is necessary to provide information for design, construction, procurement, logistics and environmental assessment. The geotechnical investigation will help to locate the ground water level and effect of soil and water on foundation material. Site Investigation serves an important purpose of evaluating general suitability of the site for the proposed project, enable economic and adequate design and make provision for difficulties/risk that may arise during various phases of a project.

**Checklist Summary: Initial site visit – What to observe**

| | | | |
|---|---|---|---|
| Construction Water ☐ | Civil Aeronautics requirement ☐ | Weather ☐ | Subcontractors availability and quality ☐ |
| Electricity ☐ | Waste Disposal ☐ | Air Purity ☐ | Availability of aggregate, etc ☐ |
| Communications ☐ | Office and Residential area ☐ | Temperature range ☐ | Machine Shops ☐ |
| Site conditions ☐ | Parking and Storage ☐ | Prevailing Wind Velocity ☐ | Testing facilities ☐ |
| Terrain and Geology ☐ | Security ☐ | Precipitation ☐ | Construction Equipment ☐ |
| Soil Characteristics ☐ | Access to site ☐ | Labour Climate ☐ | Traffic flow ☐ |
| Safety regulations ☐ | Nearest Rail-Head / aterways/ Road Transport ☐ | Labour Availability ☐ | Equipment availability ☐ |
| Medical facilities ☐ | Existing structure/Utility ☐ | Law and Order ☐ | Urban Development ☐ |

IPM has created a checklist for initial site visit and can be downloaded from the Knowledge at Work (K@W) by all L&T employees. The portal can be accessed through **https://kb.lntipm.org**

# Planning and Scheduling Pitfalls & their Preparation

**Prof. K. P. Reghunath ,Faculty, L&T IPM**

For any project success, planning is paramount. Though we spend significant time and effort towards planning, there are certain pitfalls that are commonly observed across projects. Below are the Top 5 pitfalls, any planning engineer /project manager should be aware of and avoid to ensure the plan is fool proof.

### 1. Not capturing the entire scope of the project

The normal practice is to capture only contractor's activities leaving other activities like client's activities or other stakeholder holders' activities. When the critical path passes through those left out activities, the information coming through the project schedule may not be realistic. Another tendency is to create a project schedule considering only the BoQ (Bill of Quantity) items leaving many activities which enable to perform the activities of the type 'discrete' (BoQ activities). It is also required to include activities of the type 'apportioned' and level of effort (LoE) to have a holistic schedule which will enable to identify the critical path clearly.

### 2. Missing logic between activities and presence of hangers/dangling activities

Activities must be logically sequenced and linked—that is, listed in the order in which they are to be carried out and joined with logic. The scheduling tool calculates start and finish dates of an activity based on the dependencies in a project schedule. If the dependencies between activities are not properly defined, it will cause an unrealistic schedule.

In a good quality schedule, every task should have at least one predecessor and at least one successor except the project start milestone, which has no predecessor, and the project finish milestone, which has no successor. An activity without a predecessor and/or successor is a "hanger," which is an unintended break in the schedule. Hangers are to be identified and properly establish the dependencies to the nearest intermediate milestones or project finish milestone whichever is logically right.

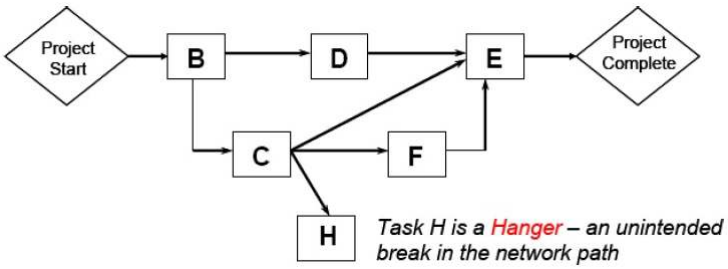



Figure 1: Example of a hanger in AoNnetwork

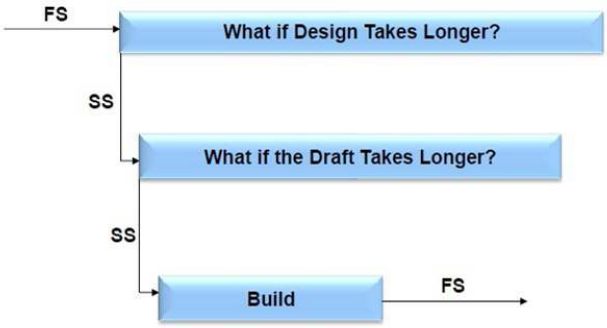



Figure 2a: Example for dangling activity in PDM network.


Figure 2b: Preferred way of capturing dependency to avoid dangling activity.

To avoid "dangling" tasks, each task should have: At least one FS or SS relationship as its predecessor & its successor

### 3. Not loading resources on activities

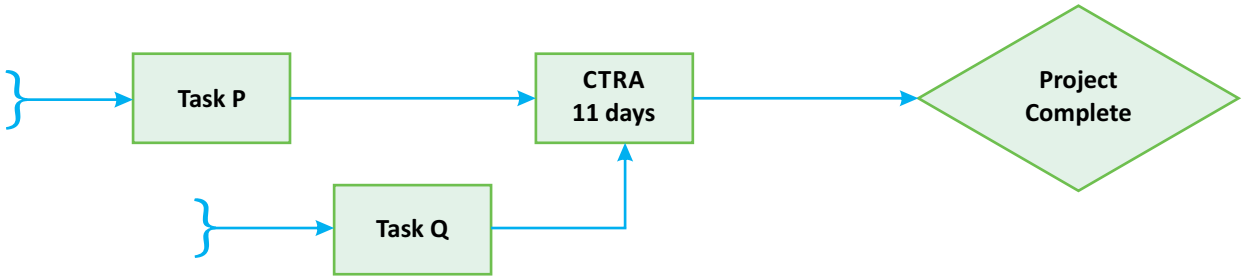
To make the schedule realistic and workable, it should have the right number of resources of right skill available at the right time and achieve the productivity assumed during estimating the activity durations. During planning, loading the project schedule with resources, will help in identifying the conflicts between the resource availability and resource demand and will help in resolving the conflicts before establishing the project baseline schedule.

### 4. Unrealistic activity duration estimates

While estimating the activity duration use the same method, historical information, and assumptions used for cost estimating. Any activity having a very large value of original duration can cause a problems in scheduling and control. Durations should be short and meaningful. Schedule should be prepared with the appropriate level of detail so that the schedule should work for the project team. Preparing a schedule with too many tasks with short duration makes the schedule unmanageable and also a schedule with fewer tasks with long duration fails to meet the requirement for which it has been made.

### 5. No provision for Construction Time Risk Allowance (CTRA)

While preparing the project budget, it is customary to include contingency reserve and management reserve for absorbing the impact of risks on cost. Adding a task for schedule contingency before the project finish milestone is highly recommended.The Schedule contingency task duration can be adjusted while updating the schedule and project finish date can stay as a constant. This will avoid the frequent changes in project finish date during schedule updating.

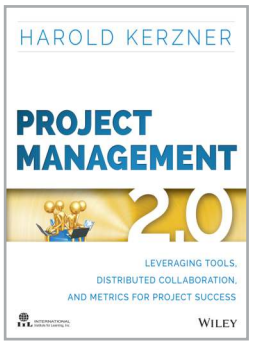



Conduct schedule risk analysis by incorporating schedule risk information of activities into a statistical simulation and arrive at the reserve of time, schedule contingency, needed for a certain level of confidence.

**References:**

1. Lukas, J. A. (2007). Is your schedule correct? Common scheduling mistakes and how to avoid them. Paper presented at PMI® Global Congress 2007—North America, Atlanta, GA. Newtown Square, PA: Project Management Institute.
2. DCMA 14-Point Schedule Assessment, Understanding and Applying the DCMA Schedule Assessment Metrics

# Look-out in the Library




*Title* : *Project Management 2.0: Leveraging tools, distributed collaboration and metrics for project success*
*Authors* : *Harold Kerzner*
*Publisher* : *John Wiley & Sons, NY*

## Review Insights

It is most comprehensive and systematic guide to project management which is applicable on large size construction, or R&D projects. It tackles the challenges of project management in a world that is becoming more technologically complex, virtual, interrelated yet decentralized, and constantly changing. The author acknowledges the changes in the project environment and has come up rightly with a name as PM 2.0. His own earlier work he refers as "PM1.0" or the more traditional systems of project management and has compared in tabular form that how PM 2.0 is different and the way it will correct flaws in the old order. The book breaks down the PM 2.0 system into great detail covering major topics such as a peek into the future of project management, growing importance of metrics in the new world order, project governance. He has specifically focussed on R&D project management which has remained as some type of mystique for a long time. Author has attractively modelled R&D function for planning, considering environmental analysis and drills down to evaluation and selection of R&D projects.

At its core, PM 2.0 recognizes that a new generation of project professionals grew up in web-based world of project management tools that allow virtual or distributed teams to work together much more closely than in the past. Advances in technology and information flow have shown that traditional project management techniques are ineffective for many of today's projects. This book offers an alternative, an updated approach that aligns more closely with the modern workflow. It helps understand and imbibe the latest developments in the mega construction and R&D projects.

In Chapter 10, it addresses problem solving and decision making in a new perspective, an area much needed for project managers today. It considers various perspective of decision such as psychological, cognitive, normative and problem solving in decision-making to great details.

In the chapter, “Need of Project Management” author comes up with PM maturity model for preparing and taking companies to future, considering continuous improvement at level 5 after crossing benchmarking at level 4. It also gives a detail account in last chapter that how PMO can fail. The book is very well-organized with a clear design, creative graphics, and valuable tables and metrics.

This book is a must read for project managers of the large project, consultants, a leader of a Research & Development team, and researchers in the field of projects.

Contributor:
**Prof. Sunil Kumar**
Faculty-L&T IPM

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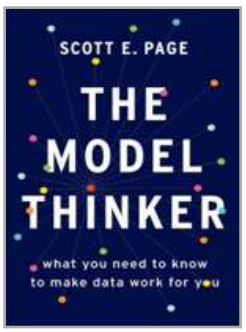



*Title* : The Model Thinker: What you need to know to make data work for you.
*Authors* : Page, Scott E.
*Publisher* : Basic Books, USA

## Review Insights

In the era, data science and data analytics is becoming necessary component of effective execution, this book is a good introduction to data science for people like me.

A hands-on reference for the working data scientist, “The Model Thinker” challenges us to consider that the historical methods we have used for data analysis are no longer adequate given the complexity of today's world. The book opens by making the case for a new way of using mathematical models to solve problems, offers a close look at a number of the models, then closes with a pair of demonstrations of the method.

Author Scott Page asserts that we are still evaluating today's far-reaching and abundant data the same way we did twenty-five years ago: That is, we look through our data, look through our models, find the single best fit, and apply. In Scott's own words.

> *"The problem is that applying one model to a problem gets us only part of the story. A one-model solution has told us, for instance, that our country's poor health is due to sugar consumption, or that Trump voters in 2016 were those who had been left behind economically. These are valid, but far from complete."*

Scott proposes a "many-model paradigm," where we apply several mathematical models to a single problem. The idea is to replicate "the wisdom of the crowd" which, in groups like juries, has shown us that input from many sources tends to be more accurate, complete, and nuanced than input from a single source. Applying this to project management: If someone is using only CPI and SPI for judging project performance, he may be getting to wrong conclusions. I advise my students to check Critical Path and Near-Critical path progress from CPM schedule and also commercial progress (invoicing progress) and then check whether they are all telling a consistent story. If not, there are hidden problems in the project.

This book emphasizes social data, because, as the author notes, people are a special challenge. You can count on, say, carbon atoms to never violate the laws of physics. People are not so reliable. We have irrational biases. Sometimes we learn from opportunities or mistakes and change our behaviour. Sometimes not so much.

Scott is a professor of complex systems and quantitative social science at the University of Michigan. His writing style is straightforward, punctuated with bursts of unusual metaphors. Check paragraphs such as the following:

> *Confronted with a complex system we cannot, to paraphrase Plato, carve the world at its joints. We can partially isolate the major causal trends and then explore how they are interwoven. In doing so, we will find that the data produced by our economic, political, and social systems exhibits coherence. Social data is more than sequences of incomprehensible hairballs that might have been spit up by the family cat."*

In projects of public visibility such as Metro projects etc., the challenges in the projects are more on economic, political and social systems, than complexities of technical execution. Technical execution often has some proven solutions, often to do with planning and using of new techniques or mechanisation. Social-Economic issues need constant awareness and proactive actions of advocacy and tactful handling.

In the final chapter, Page demonstrates his method by tackling two real-world issues: the opioid epidemic and economic inequality. By applying the many-model paradigm to income inequality he illuminates many interlocking causes including economic development, sociological trends, political power, and the weight of history.

A single model can track the flow of money among the generations. Another can examine the factors involved in the disparity of the pay of educated and uneducated workers. This endeavour brings us gradually nearer to a complete picture. Applying this in project context, more often construction manager's start complaining about labour productivity, without paying due attention to living conditions, enabling tools and equipment and improving work processes to ensure material / work front availability for construction workers. Very often 30 to 40% of construction worker time goes waste because of logistical aspects of job allocation, poor handling of tools and tacking and lack of coordination between trades.

What has given this book a place in L&T IPM's permanent library and in my Kindle library, is its deep dives into dozens of models, with not only Equations and the diagrams but also are applications.

Chapter 11 tells us that broadcast, diffusion, and contagion models are used in communication, marketing, and epidemiology. These models are equally useful for how people learn new information or how people catch a disease. We probably could study these models further and examine how we can promote culture of constant learning in the company.

As an example, one might think allocating contingency as a percentage is an easy option compared to using a Monte Carlo simulation, but as more people apply such techniques as a norm, everyone becomes more likely to apply them in practice. Similarly when PPE was to be enforced it was considered as waste of time and today PPE is more a norm than a choice. This logic applies to applying global best practices, using digitalization and leveraging technology. Ease of use and rapid adaptation as main mode of communication made WhatsApp so popular.

Finally, Scott reminds us in each chapter to ever be on the alert for the dangers inherent in our work. The tight-jeans example had to allow that the probability of adoption per exposure increased with more exposures. A model that had simply used data on past behaviour to estimate future behaviour would not have worked because people can learn and respond to changes in their environment. Such are very appropriate and grounding.

In my opinion, multi-model approach and thereby observing/ achieving congruency is very important and it prevents us from making wrong decisions in complex and large projects.

Please visit L&T IPM Library in Baroda and look at our new collection of books that add value to our thinking and our business too.

Contributor:
**Prof. VTCS Rao**
Dean - L&T IPM

# Programme Panorama

## Snapshots of SCDMs (Specific Competency Development Programmes)

### Preparatory Programme on PMP Certification

**Programme Highlights:**

Practical examples to match PMBOK concepts to project situations. Exam question-answering strategy with specific tips and tricks. Detailed "Exam Roadmap" with a Project Management approach to preparing for the exam. Coverage of both Data Flow Diagrams + Tools & Techniques for all 49 processes. The programme delivered by PMP Certified Practicing Project Professional Mr. Karthik Ramamurthy. Total 16 participants attended the programme.

**Preparatory Programme on PMP Certification**
Held from 22nd to 26th April 2019 at IPM Chennai

### Risk Analysis & Profitability Management

**Programme Highlights:**

The aim of this programme is to help participants understand the subjects of Risk Analysis and Profitability Management to a deeper level and develop competency in subject areas as they relate to their role in the organization. The programme was delivered by renowned faculty Dr. Makarand Hastak. Total 23 Participants attended the programme.

**Risk Analysis & Profitability Management**
Held on 25th & 26th April 2019 at L&T Powai

### SCDM on Cost Management Concepts in EPC Projects

**Programme Highlights:**

Programme emphasized on different aspects of Cost Management Concepts such as Fundamentals of Project Costing, Project Cost Control process including usage of measurement tools like EVM (Earned Value Management) and reporting tools like JCR (Job Cost Report). The programme was delivered by Dr. Hiren Maniar through classroom lectures and exercises supported by case study analysis and discussions, Total 30 participants attended the programme. Major participation from Hydrocarbon Engineering and Transportation infrastructure ICs.

**SCDM on Cost Management Concepts in EPC Projects**
Held on 29th & 30th May 2019 at IPM Vadodara

### SCDM on Managing Financial Performance of EPC Projects

**Programme Highlights:**

The programme covered an in-depth understanding of contracts, commercial terms & conditions, stakeholders' requirements along with project performance commitments. The participants learned financial performance measurement as tools in assessing the viability as well as profitable and efficient execution of EPC Projects. In addition, participants also developed and understanding of how pricing and cost control behavior affect gross margins and business profit; the key financial principles of planning and delivering a successful and profitable project. Total 28 Participants attended the programme.

**SCDM on Managing Financial Performance of EPC Projects**
Held on 29th & 30th April 2019 at IPM Vadodara

**Preparatory Programme on PMP Certification**
Held from 3rd to 7th June 2019 at IPM Vadodara

### Preparatory Programmes on PMP Certification

**Programme Highlights:**

Practical examples to match PMBOK concepts to project situations. Exam question-answering strategy with specific tips and tricks. Detailed "Exam Roadmap" with a Project Management approach to preparing for the exam. Coverage of both Data Flow Diagrams + Tools & Techniques for all 49 processes. The programme delivered by PMP Certified Project Professional Mr. V. Arun along with other IPM Faculty. Total 16 Participants from various ICs attended the programme.

## Ikons of IC - Specific Programmes

**Tendering & Contract Management**
Held on 8th & 9th May 2019 at IPM Chennai

### WET IC - Tendering & Contract Management

**Programme Highlights:**

The programme focused on basic Tendering, Risk management, Sub-contract management and contract closure including delay analysis and claims management. Total 20 participants from WET IC attended the programme which was delivered by Mr. Sunil Kumar, Faculty of L&T IPM.

### WET IC - Orientation Programme on Project Management

**Date** : 6th & 7th May 2019

**Venue** : IPM Chennai

**Programme Highlights:**

The programme covered fundamentals project management which includes: Overview of Project Management, Project Management Framework, Project Life Cycle, Project constraints, Quality & Safety in Project Management and risk management. Total 18 participants from WET IC attended the programme.

**Tool based SCDM - Primavera (WET IC)**
Held from 10th to 12nd June 2019 at IPM, Chennai

### WET IC - Primavera

**Programme Highlights:**

Primavera is a popular and powerful tool for project planning and monitoring. A 3 days programme focused on various features and aspects of Primavera, provided the necessary exposure to project managers for handling complexities of managing single and multiple projects. Total 15 participants from various WET IC undergone this programme which was delivered by IPM faculty Mr. K.P. Reghunath who is a specialist in Project Management software.

**Planning Engineers Capability Building Programme**
Held from 10th to 14th June 2019 at IPM, Chennai

### Geo Structure: Batch 1 – Module 4: Planning Engineers Capability Building Programme

**Programme Highlights:**

Specially designed programme (4 modules) to build planning competency in project personnel of Geo Structure. This being the concluding module every participant have presented their integrated project assignments based on their project. The valedictory function was presided by Mr. S Kanappan (IC Head – Geo Structure). Total 20 participants from Geo Structure have attended the programme. The top 3 participants have been awarded.

### PT&D: Batch 2 - Special Programme for Excellence in Engineering and Design Management (SPEED)

**Programme Highlights:**

SPEED programme curriculum has been specially designed to suit the requirements of PT&D Engineering professionals. The 6 days programme was delivered jointly by IPM faculty and PT&D domain experts at IPM Chennai.

**Special Programme for Excellence in Engg. and Design Mgmt. (SPEED)**
Held from 10th to 15th June 2019 at IPM, Chennai

## Flying High with Flagship Programmes

### Batch 2 - L1 – Advanced Course in Project Management

**Programme Highlights:**

The course is designed to enhance project execution competencies of project professionals and to provide knowledge, skills and tools across the complete spectrum of knowledge areas in Project Management. Total 20 participants attended the programme. In the First Module, the course contents are more focused on three knowledge areas mainly: Project scope & Change Mgmt., Project stakeholders & Communication Mgmt. and Project Quality Management. EPC Project & product development Life cycle also discussed in detail.

**Advanced course in Project Management**
Held from 6th to 10th May 2019 at IPM Chennai

### Batch 13 - L1 – Advanced Certification in Project Management

**Programme Highlights:**

The programme started in July 2017and completed in April 2019, It consisted with 8 Modules conducted over two years covering various topics of project management in detail. In the last module completed recently covered: Project site & execution, Project hedging, Project communication & Change management. Participants presented project assignment and appeared for Viva on the assigned topics. Total 17 participants from various IC/ BU's of L&T have participated and finally successfully qualified in the programme.

**Advanced Certification in Project Management**
Held from 29th April to 4th May 2019 at IPM Vadodara

### First Level Leadership Programme (FLLP)

**Programme Highlights:**

This programme designed to initiate young professionals into the fundamental principles & practices of leadership. The core objective of the programme is to provide comprehensive exposure to business management along with concepts to enhance self-effectiveness. Total 64 participants attended the programme. Participants gained knowledge on project execution and profitability, Project risk, working capital, contracts management and project management simulation in real-life projects. Programme delivered by renowned faculty, Dr. Makarand Hastak along with IPM Faculty.


**First Level Leadership Programme (FLLP)**
Held from 22nd to 26th April 2019 at LDA Lonavala

# Tool based Programme

**Tool based - Primavera**
Held from 20th to 22nd May 2019 at IPM Chennai

### Primavera

**Programme Highlights:**

Primavera is a popular and powerful tool for project planning and monitoring. A 3 days programme focused on various features and aspects of Primavera, provided the necessary exposure to project managers for handling complexities of managing single and multiple projects. Total 17 participants from various ICs/BUs undergone this programme which was delivered by IPM faculty Mr. K.P. Reghunath who is a specialist in Project Management software.

# Role based Programme

**Adaptation Programme in Quantity Surveying (APQS)**
Held from 22nd to 27th April 2019 at RICS Noida

### Batch 4 - Adaptation Programme in Quantity Surveying (APQS)

**Programme Highlights:**

L&T IPM has completed fourth batch of APQS- Adaptation Programme in Quantity Surveying. This programme is affiliated with Royal Institution of Chartered Surveyors (RICS), RICS school of Built Environment, Amity University, Noida. The final module conducted at RICS campus, Noida covered and BIM strategy in detailed. Participants were given exposures for mock interviews for certification. Total 25 participants from various ICs attended the programme.

**Adaptation Programme in Quantity Surveying (APQS)**
Held from 13th to 18th May 2019 at IPM Chennai

### Batch 5 - Adaptation Programme in Quantity Surveying (APQS)

**Programme Highlights:**

L&T IPM has launched fifth batch of APQS- Adaptation Programme in Quantity Surveying recently. This programme is affiliated with Royal Institution of Chartered Surveyors (RICS), RICS school of Built Environment, Amity University, Noida. The first module was conducted at IPM Chennai. This programme is exclusively designed for project personnel working in different business units of L&T which are executing mega & multiple complex projects. A Quantity Surveyor is concerned with the costs and financial management of the construction project life-cycle. Total 20 participants attended the programme.

## TESTIMONIAL

I have attended three days training programme on "TOOL BASED SCDM – PRIMAVERA" at IPM Chennai. Prof. K.P. Reghunath (trainer) helped me understand basic terminology used in planning, various tools used in Primavera, understand and prepare schedule and learnt various features available in Primavera. The programme was well structured with theoretical and practical experience on using Primavera. The overall training was very well arranged by IPM.

**– Mr. Manish Mutha**
L&T Hydrocarbon

# From the "World of Webinars"

IPM has been conducting its 3P WEBINAR series since October 2017 wherein "Problems, Principles and Practices" (3P) on various specialized topics in Project Management have been deliberated

**Webinars delivered during April - June 2019**

| | | |
|---|---|---|
| **17th April 2019** | **Cost Estimation and Baseline Preparation in EPC Project** | **Dr. Hiren Maniar** |
| Webinar addressed the identification, elaboration, planning, and management of efficient cost estimation and baseline Preparation in EPC Projects. The webinar highlighted the importance of estimating and budgeting aspects for achieving committed project performance during execution stage. | | |
| **6th May 2019** | **Earned Value Management Primer** | **Prof. K P Reghunath** |
| Earned Value Management (EVM) facilitates the integration of project scope, time & cost objectives and the establishment of a baseline plan against which performance can be measured during the execution of a project. It has the unique ability to combine measurements of work performance (completion of planned work), schedule performance (behind or ahead of schedule) and cost performance (below or above budget) within a single integrated methodology. During the Webinar, participants learned the terminologies related to the Earned Value management Technique. | | |
| **14th May 2019** | **Managing Working Capital in EPC Projects** | **Dr. Hiren Maniar** |
| Webinar emphasized the key components of working capital, including cash, inventory, receivables, and payables and also focused on financial decision making with regard to working capital issues with an objective to minimize working capital requirements in projects and maximize shareholder wealth. | | |
| **22nd May 2019** | **Managing Sub Contracts Choices and Challenges in Complex Project** | **Mr. Siva Kumar**<br>Contracts Manager<br>Stantec Consulting, Canada |
| The webinar focuses on real time experiences on Managing subcontracts in complex projects with project case studies. The participant gained knowledge about the practices necessary to overcome challenges, by identifying practical and realistic choices available for project personnel from varying background such as Engineering, Contracts / Procurement and Construction. | | |
| **29th May 2019** | **Construction Productivity Management** | **Prof. Sunil Kumar** |
| Construction productivity is a vital component of any building project, without it projects become delayed and budgets quickly become overwhelmed. The webinar made participants understand construction productivity and apply it on site work for labour, equipment and other resources | | |
| **15th June 2019** | **Critical Chain Project Management** | **Prof. K P Reghunath** |
| Critical chain Project management (CCPM) is a powerful technique for project management, particularly planning & monitoring. This webinar introduced concepts of Theory of Constraints (TOC) & CCPM and their application in Project planning. Participants learned how CCPM help them easily monitor their project by just tracking the buffer provided at the end of the project. | | |
| **19th June 2019** | **Financial Performance Improvements in EPC Projects** | **Dr. Hiren Maniar** |
| Webinar focused on different aspects of financial performance improvements in EPC Projects such as improving project cash flows and liquidity, optimizing project working capital along with efficient project cost management. | | |

# IPM – Programme Calendar

## Forthcoming Quarterly Programme Details

### Multi Modules Programmes

| Sr. No | Programme details | Date | Location |
|---|---|---|---|
| 1 | Level 1 + : Postgraduate Certificate of Master's Programme in Business and Project Management jointly delivered with SDA Bocconi School of Management | 15th - 19th July 2019 | Vadodara |
| 2 | Level 3 : International Project and Programme Management (IPPM) Jointly delivered with University of Texas at Austin, USA | 29th July - 2nd August 2019 | Vadodara |
| 3 | Level 2 : Advanced Programme in Excellence in Project Execution (APEPE) | 26th - 30th August 2019 | Vadodara |
| 4 | Batch 5 : Cost Engineering Programme | 16th - 21st September 2019 | Vadodara |

### Specific Competency Development Module (SCDM)

| Sr. No | Programme details | Location |
|---|---|---|
| | **JULY 2019** | |
| 1 | Primavera | Vadodara |
| 2 | Cashflow and Liquidity Management in EPC Projects | Vadodara |
| 3 | Sub Contract Management | Chennai |
| | **AUGUST 2019** | |
| 4 | Supply Chain Management | Chennai |
| 5 | M S Project | Chennai |
| 6 | Statistical Quality Control in EPC projects | Vadodara |
| 7 | Commercial aspects in EPC Projects | Vadodara |
| 8 | PMP Preparatory Course | Chennai |
| | **SEPTEMBER 2019** | |
| 9 | Construction Productivity | Vadodara |
| 10 | SCDM - Best Practices in Project Scheduling | Chennai |
| 11 | Managing Financial Performance of EPC Projects | Chennai |
| 13 | Customer Relationship Management (CRM) | Chennai |
| 14 | PMP Preparatory Course | Vadodara |

### 3P Webinars - Problems, Principles and Practices

| Sr. No | Webinars | Lead Faculty |
|---|---|---|
| | **JULY 2019** | |
| 1. | Strategies for effective subcontract management | Prof. Sunil Kumar |
| 2. | Working Capital Management | Dr. Hiren Maniar |
| 3. | Risk & Profitability | Prof. VTCS Rao |
| 4. | Lean Project Management Best Practices | Mr. Kalyan Vaidyanathan |
| 5. | Scheduling, Monitoring and Controlling Linear Projects | Prof. K. P. Reghunath |
| 6. | Quantitative Methods | Prof. Sunil Kumar |
| | **AUGUST 2019** | |
| 7. | Project Pre-Bidding Financial Performance Analysis in EPC Projects | Dr. Hiren Maniar |
| 8. | Contract Interpretation | Prof. VTCS Rao |
| 9. | Cost Estimating | Dr. Hiren Maniar |
| 10. | Project Risk Management Primer | Prof. VTCS Rao |
| 11. | Scheduling Best Practices | Prof. K. P. Reghunath |
| 12. | Cost Control | Dr. Hiren Maniar |
| | **SEPTEMBER 2019** | |
| 13. | Emerging complexities & project management trends | Prof. VTCS Rao |
| 14. | Scheduling Techniques for Predictable Project Performance | Prof. K. P. Reghunath |
| 15. | Effective Equipment Management | Prof. Sunil Kumar |
| 16. | Project Finance Management in EPC Project | Dr. Hiren Maniar |

NOTE: For schedule dates of above programmes kindly visit – **www.lntipm.org**

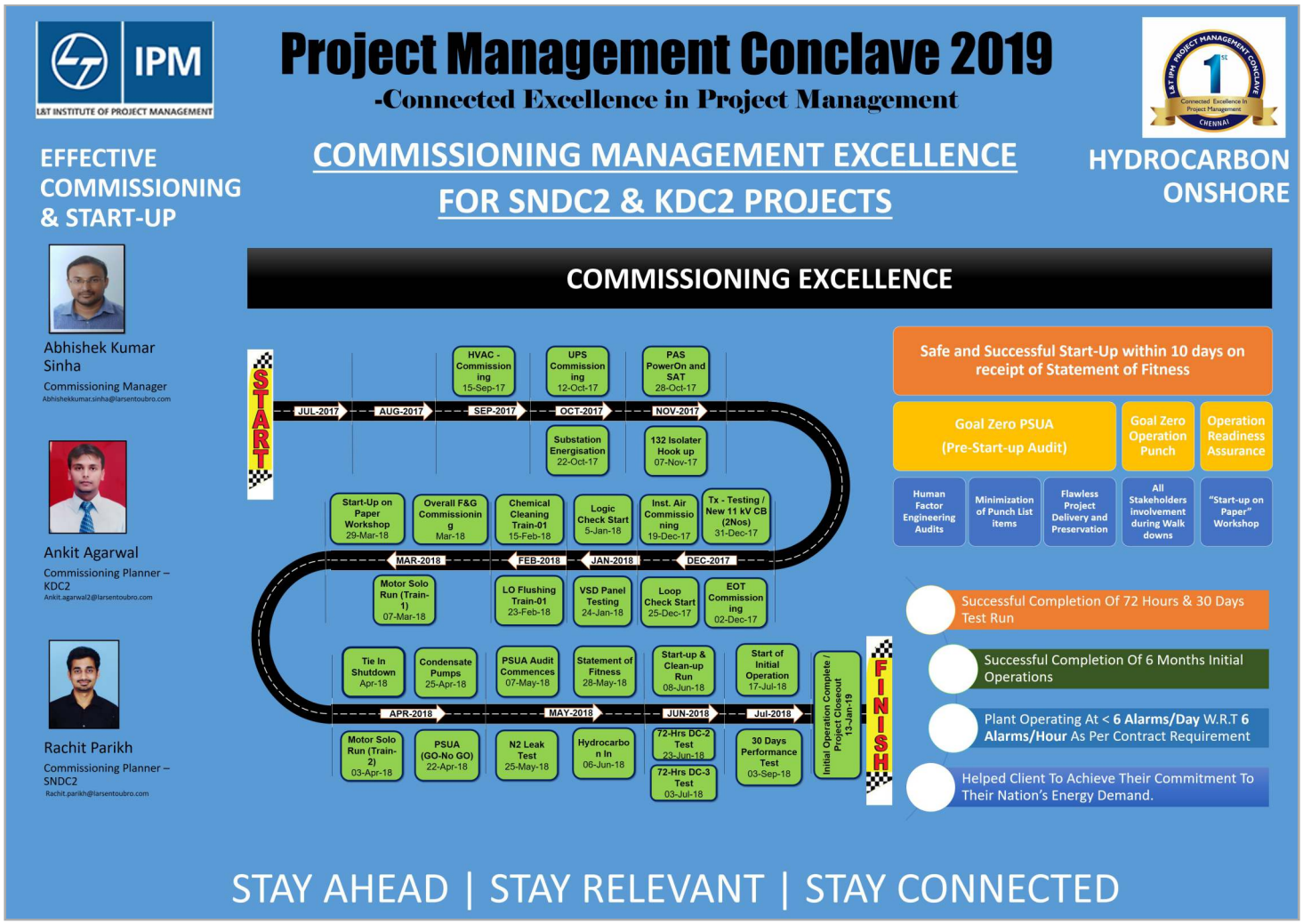
## TESTIMONIAL

**Planning Engineers Capability Building Programme (PEP) - IPM and L&T GeoStructure – Batch 1**

After being nominated for PEP, I had a slight apprehension that the programme might be a bit overwhelming for a GET like me. But all the topics covered, though advanced, started from the very basics. For example, scheduling was covered from basic network diagramming to advanced cost and resource loading in MS Project. Though the programme was focussed on planning, it also covered various other aspects (like risk, contract, stakeholder and supply chain management) whose understanding are required to be a proper planner. Theory on each topic was followed by case studies, exercises and simulations which reinforced the concepts with real life scenarios. With the knowledge gained, I hope to implement concepts like MCDM, EVM & MSP schedules in our running and future projects.

**– Ms. Masha A**
L&T GeoStructure

# AWARD WINNING POSTER
## in CEPM Conclave 2019




Please send your valuable suggestions & comments to
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