

Timely Completion of Project A Big Challenge

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I. Introduction

PROJECT:

•A project is a group of unique, inter-related activities that are planned and executed in a certain sequence to create a unique product or service with in a specific timeframe, budget and the client's specification. The project Management process is based on the PMI (Project Management Institute) process terminology as founding the PMBOK (Project Management Body of Management).

IMPORTANCE OF PROJECT MANAGEMENT:

In today's competitive and chaotic global economy companies are turning to Project Management to consistently deliver business results. Companies are clearly seeing the pay off from investing time, money and resources to build organizational project management expertise: lower cost, lesser time, greater efficiency, improved customer and stake holder satisfaction and greater competitive advantage. Executives discovered that adhering PM methods and strategies has reduced risks, cut costs and improved success rates which are vital to survive the economic crisis. Keeping the project on track requires a strict management of metrics and project goals that extends across the project team and out to suppliers, contractors, the client and the stakeholders. With right resources, a clear time frame for delivery and senior leadership support, a strong and disciplined PM practices will drive an organization forward, says Mr McKnight. "It's how we stay competitive in the market place.

Ten Characteristics of Project Management•

- .1. Expert knowledge of Project Scope
- 2. Planning, Project scheduling &time management
- 3. Forecasting, Budgeting& cost management
- 4. Quality& Safety Management
- 5. Networking Boundary Management
- 6. Leadership
- 7. Communication
- 8. Negotiation& conflict Management
- 9. Risk management
- 10. Environment& Stack holders Management

STAGESOF PROJECT EXECUTION

- Initiation
- Planning
- Execution
- Monitoring & Control
- Completion & Closure

INITIATION

It Covers

a) **Charter: -**

It is a concise, easy to read and to the point document. It is a contract between owner/sponsor. It covers Project title and description, scope statement authority levels, Business case, Level of Risk, Stakeholders, Goals& Objectives, Approaches, Milestones, Deliverables, Assumptions.

b) **Scope: -**

It got answer for many questions generally people ask to know about a project such as what, why, when, who, how much, where etc. Further it should also clearly mention what is out of scope for this project to avoid scope creep at a later date.

c) **Deliverable: -**

It elaborates the project interim Milestones called deliverables in time and cost.

d) **Client: -**

Details about various Stake holders they can be identified on the basis of their power to contribute or withhold and/or to accept or reject outcomes and concern as they are affected by technical and social impacts and perceptions. Hence, they can be Proponent/ Resistor.

Any one affected by activities or results of a project. Who can influence, support or resist the outcome and who can have a personal, financial or professional interest in the outcome of the project.

COMPETING CONSTRAINTS

These are five major areas of concern (Competing Constraints) in Project Management.

1. SCOPE with SMART objectives
(Specific, Measurable, Attainable, Relevant & Time bound)
2. COST
3. SCHEDULE or TIME
4. SAFETY& QUALITY
5. RESOURCES

PROJECT PROCESS:

Initiation, Planning, Execution (including design, procurement& contracting) Monitoring & Control & Closing are various process of Project Management. In which planning, execution& control are continuous process throughout life of the project.

McKinsey 7S model of PM:

The key elements are

1. Strategy,
2. Structure,
3. Systems,
4. Staff,
5. Style,
6. Skills
7. Super ordinate goal of Organization.

PROJECT PLANNING:

It covers the followings:

1. Sub dividing the Scope in to deliverables and activities (WBS)
2. Identifying interdependencies between activities of Master Network
3. Estimating time for each activity and developing the project schedule.

Program Evaluation and review Technique(PERT) originally developed by U.S Navy and Critical Path Method (CPM) by Dupont PERT used for probabilistic(or uncertain)estimates of activity durations and CPM was used for deterministic (or Certain) estimate of activity duration but included both time and cost estimates to allow time/cost trade-off to be used. Both methods employed to schedule and display task sequences.

FRAMEWORK FOR PERT&CPM:

Essentially there are 05 steps which are common to both the techniques. The Procedure is listed below:

1. Define the project and its significant activities or tasks. The project should have a single start activity and a single finish activity.
2. Develop the relationship among the activities. Decide which activities must precede and which activities must follow others.
3. Draw the Network connecting all activities. Each activity should have a unique event number. Dummy arrows are used where required to avoid giving the same numbering to two different activities.
4. Assign time and/or cost to each activity.
5. Compute longest time path through the network. This is called CRITICAL PATH. The project can not be completed less than this time duration without investing additional cost. Resources are to be optimally used by concentrating on these few activities as the same determine the fate of entire project.
6. Tabulation and analysis of activities are done to find out ES, EF LS,LF Total float taking duration of time for each activity. Some of the terminologies are as detailed below:

ES (Earliest start) is the starting time of activity, EF(Earliest Finish) =ES+ duration of time LF (Latest finish Time) & LS is LF- duration .

Total float is the spare time available when all preceding activities occur at the earliest possible time and all succeeding activities occur at the latest possible times.

Hence Total Float =Latest start time of activity -Earliest Time of same OR Latest Finish time -Earliest Finish time. Activities with zero total float are in CRITICAL PATH. Total float is same as Float and also as slack.

Free Floats the spare time available when all preceding activities occur at the earliest possible times and all succeeding activities occur at the earliest possible times.

Hence activity has zero total float will also have zero Free Float.

In case of PERT activities shall have three times t_0 -The most optimistic time, t_p -The most pessimistic time and t_m = The most likely time and the Expected time (t_e) of activity shall

$t_e = (t_0 + 4t_m + t_p) / 6$. In case of Beta distribution standard deviation $S = (t_p - t_0) / 6$ and variation is square of SD. Other procedures for deriving project duration are same as CPM. At $t_e \pm SD$ the project can be completed with 68%. For 95% we have to add 2SD. Further to know the probability of completing project by time D instead of t_e we are to find $Z = (D - t_e) / SD$

4. STAFF & TEAM BUILDING

Team Life cycle such as forming, storming, norming, performing and adjourning is to be tuned with respect to project life cycle from initiation to close out. The responsibilities to various team members need to be assigned by assessing their interest in themselves with respect to their interest in others. The project success shall depend upon their nature in dealing conflict situations during project execution. Their natures can be of Avoiding, Accommodating, Forcing, compromising or collaborating/ problem solving type.

5.Estimating cost of project and also at each milestone and Project Budgeting and utilisation.

Budget is an organization plan stated in monetary terms. It reflects the actual financial operation of the business. Financial position at different milestones/stages of project as forecasted or estimated and as actual executed needs to be planned monitored to have overall control on total cost of the project after completion of same.

6.Risk Planning

To identify risks by SWOT, Brain storming Cause and Effect Diagram. Evaluate probability of occurrence and its impact Risk Matrix, Risk response planning. (Risk Strategies avoid, transfer, Mitigate & accept) In avoiding risk we are to eliminate threat. To transfer insurance is to be taken. For mitigation we are to reduce probability and impact by mitigation planning and by Reserve plan. Once risk is accepted then contingency is to be planned.

7.Development of Integrated Project Plan

8.Quality planning

19.Safety Assurance planning

10.HR and communication planning

11. Plan for obtaining and adhering related Environment clearances/approvals and respecting all statutory norms of state and central government.

EXECUTION STAGE:

Some of the most important skills required in Project Execution Stage are:

- LAND ACQUISITION & INFRASTRUCTURE DEVELOPMENT
- RESOURCES PLANNING & MOBILISATION& IMPLEMENTATION OF PROJECT MILESTONES
- FIELD QUALITY SYSTEM MANAGEMENT & FOLLOW UP FOR INSPECTION OF EQUIPMENTS
- SAFETY SYSTEM MANAGEMENT
- INTERNAL & EXTERNAL ENVIRONMENT MANAGEMENT
- ENGINEERING ISSUES FOLLOW UP INCLUDING TYPE TEST
- CHANGE MANAGEMENT
- PEOPLE MANAGEMENT

- OTHER STAKEHOLDER MANAGEMENT PROJECT MILESTONES FOR 500MW & 660 MW UNITS

O	Activities	Mile Stone Duration In Months
1	Main Plant award	0
2	Boiler Erection	10
3	Drum Lifting	16
4	Hydro test	26
5	BLU	36
6	Steam Blowing	38
7	Rolling and Synchronization	40
8	Commercial Generation	46

SL NO	Activities	Mile Stone Duration In Months
1	Main Plant award	0
2	Boiler Erection	12
3	Hydro test	36
4	BLU	42
5	Steam Blowing	43
6	Rolling and Synchronization	45
7	Commercial Generation	48

LAND ACQUISITION

1. Land acquisition & front H/O to various Agencies for main plant, Township, Ash Dyke and Railway siding.
 - a. Support of State Authorities.
 - b. Involvement of Experienced Project Team.
 - c. Preferably Posting of Employees of same state.
 - d. Deployment of facilities such as vehicles & extension of accommodation and other minimum facilities.
 - e. Correctness of Documentations.

2. Development of infrastructure facilities:

- a. Construction of boundary wall.
- b. Construction of roads, drains and culverts from nearest villages/ towns.
- c. Gate and security arrangements.

3. Site Levelling:

- a. Proper documentation w.r.t various levels and various types of soils encountered.
- b. Correctly Documentation w.r.t volume of various types of soils encountered.
- c. Cutting & filling volume w.r.t quantity quality of soils to take care royalty issues.

4. Arrangement for construction water & construction power.

- a. Construction of required number of tube wells in plant, township and Ash dyke areas.
- b. Construction of Power supply network for plant & township.
- c. Construction of Temporary Project office, canteen & Public information Centre and First Aid centre.

5. Enabling facilities inside plant & township.

- a. Sites for Lighting Mast undisturbed during construction period.
- b. Routing for construction power Network.
- c. Location of Temporary canteens.
- d. Location of lay down & Fabrication yards.
- e. Watch Towers
- f. Labour Colony with facilities (roads, drains, power, toilets, drinking water etc.)
- g. Green belt
- h. Disposal/ Stacking facilities for over burden.

6. Type Tests

- a. Type test issues need to be given due thought.
- b. Extended warranty/ additional BG/Payment withheld in lie of TT
- c. Type test for imported equipment/Materials.

7. Quality assurance & Inspection.

- a. FQPs to be released on priority
- b. Due thought in finalizing FQP with practical approach.
- c. ambiguity in FQP delays site work Execution (Hydro/RT/UT)
- d. Clarity in specification (Fabrication at site/factory, Welding or threading in GI pipes)
- e. MQP finalisation with clarity w r t standards/specifications.
- f. PDI/Non PDI/Stage or final Inspection.

8.Managing Change in Project:

For any change there will be resistance first and the emotion level passive to active with respect to time duration the responses can be initially from stability, immobilisation, denial, anger, bargaining, depression Exploration and lastly it shall reach to acceptance.

9.PEOPLE MANAGEMENT

Excellent influencing skills require a healthy combination of interpersonal, communication, presentation and assertiveness techniques. The various principles are Liking, exhibiting authority, posing scarcity (more desirable if less accessible) Hence an effective Principle of consistency, reciprocity and social proof. (what others in similar situation has done)

10. Erection of Equipment

- a. Sequence of erection of Structures, equipment etc to be studied and finalised.
- b. Priority for civil works over Mechanical& electrical works.
- c. If blasting is involved it is to be given priority for safe erection and construction works.
- d. Certain foundations to be completed first and back filled to carry out assembly of equipment.
- e. At multi activity areas work and resource planning to be done suiting to site.

11. Safety

- a. Safety at work place highly essential.
- b. Required Qty PPEs supply& Use.
- c. Deployment of required no's of Experienced& Qualified safety officers and safety stewards.(1/50)
- d. Proper make and rating of cranes, Hydra, chain pulley blocks winch machines etc.
- e. Periodic check and certification of lifting equipment by authorised agencies.
- F. Qualified and experienced Operators and drivers with license.
- g. periodic Training and awareness for operators, drivers and workers.

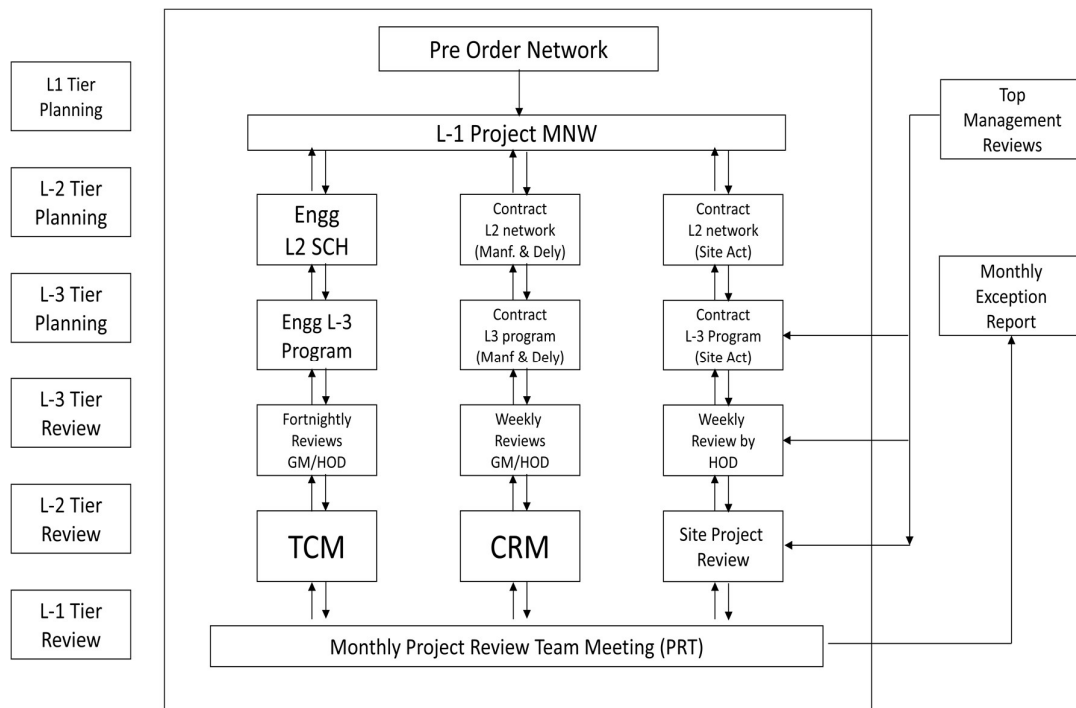
- h. Labour canteen, drinking water, Toilet, worker rest room etc.
- g. Proper illumination.
- h. Staircase, gratings, temporary platforms, toe guards, handrails etc.
- i. Qualified and experienced Operators and drivers with license.
- j. periodic Training and awareness for operators, drivers and workers.
- k. Labour canteen, drinking water, Toilet, worker rest room etc.
- n. Barricading of areas.
- o. HIRA, JSA
- p. Earthlings, ELCB
- q. Fire extinguisher portable hose
- r. House keeping
- s. Workers movement around moving equipment's.
- T. CLIMS
- U. Workers induction Training and medical checking.
- v. Vehicle speed control, back horn
- w. Pep talk or Tool talk.
- x. Involvement of Line managers top to bottom.
- Y. First aid centre, ambulance.
- Z. safety camera Safety control room

PROJECT MONITORING & CONTROL REVIEW:

Monitoring is the collection, recoding and reporting of project execution information to PM and other relevant stake holders. Control uses the monitored data and information to bring actual performance into agreement with the plan.

1. Schedule: Is the project is moving on time? Or how long it is going to take and what actions are being taken to bring on time?
2. COST: Whether the Project is going to be completed at budgeted cost? How much did we spend at this stage of project against the target pl?
3. Functionality/SCOPE: Do the project deliverables covering all the Scope of the project? Any change / deviation?
4. Quality: Whether stipulated quality norms are being adhered to? Any corrective actions need to be taken to ensure quality and sustainability?

It covers designing monitoring and control system and cycles.



Stage authorities in line with approved Planning & monitoring of Engineering, Contracts, Quality and Inspection, dispatch of equipment, Erection and Commissioning activities continuously at various stages and timely feedback to L-2 or agreed L-3 is corner stone for project success. In this regard following steps can be followed.

- Review of engineering issues weekly and monthly by project engineering.
- Review of engineering issues by Project Engineering, associates and site (EIC&TS) every month through TCM (Technical Committee Meetings).
- Review of engineering issues at project site by EIC and associates for site requirements.
- Review of readiness of equipments & materials by corporate contracts weekly for various packages.
- Reviewing readiness of equipments & materials by corporate contract, site EIC & associates every month through CRM.
- Review of site works by EIC with associates during every week
- Review & monitoring of site works by EIC, associates & Project Head every month.
- Review of inspection & clearance of material & equipment at corporate, regional & site project levels.
- Site quality audits during months for each package with EIC, FQA & associates.
- Review of exception reports of FQA, RIO, by Project Head, and Regional Head & Corporate Quality Assurance.
- Monthly review of engineering, contracts, quality & inspection issues and progress of site works by project head in association with EIC, TS, corporate engineering, corporate & site quality, corporate & site contracts & forwarding exception & critical issues to regional & corporate heads.
- Review & monitoring of critical issues of the package by corporate HODs in association with Project & regional representatives & associates.
- Review of critical issues/packages by corporate head along with regional and project heads in association with associates.
- Timely projection and decision of critical issues at various levels is the crux of sound project management.
- Forecasting of budget package wise for a period of two years and planning the same up to micro level of monthly/weekly in tune with approved L-2/L-3 network.
- Monthly monitoring of utilization of package budgets by project head along with EIC & finance is essential.
- The Integrated project monitoring network which covers above mentioned inter and intra level progress monitoring is as detailed below.

EVALUATION AND CLOSING OF PROJECT:

The purpose of evaluation is to learn lessons that can help the project team to avoid doing things that cause undesired outcomes and to continue which is helping already. Project auditing is required to have self-control and also satisfaction. At the end of execution phase all required deliverables are constructed and commissioned and operated in a sustained way as stipulated in project Charter or business case and accepted by the customer/owner. The project have achieved the objectives and delivered the business benefits described in business case. Then the project can be formally closed by undertaking the activities.

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