preprocessinc

Megaprojects

Industrial Megaprojects are large, complex projects usually with a capital expenditure of $1 billion or greater. Multiple technologies from multiple providers are integrated into a safe and functional multiproduct plant. Large strategic procurement of varied resources leads to not only gain economy of scale in the supply cost of various components, but also to simplify the on-gong maintenance of the plant by having a common basis of component equipment. Megaprojects integrate multiple industrial traditions and standards. Sometimes traditional cultures and procedures conflict and the leadership must resolve the differences effectively to insure success. "Traditional" megaprojects repeat application of known processes to reduce the technology risk. "Entrepreneurial" megaprojects are "first of its kind" applications with a risk mitigation strategy built upon the detail of the development work, the availability of parallel pilot systems to work out problems that emerge, and the skill set of the team in attacking aggressively the need to deliver answers to problems through troubleshooting and applying data based decision-making rigor across the enterprise.

- Traditional
    - Established methodology
    - Well developed chemistry and process
    - Reapplication of known technology
    - Serial development of requirements and opportunities
    - Forward pass timeline with accepted predictable contingencies
- Entrepreneurial
    - Pivot with opportunities
    - Decisions without all the data
    - Backing into the solution
    - Backwards pass versus forward pass
    - Start with the end in mind
    - Design to a datum

In a megaproject, less is more. A few really good people, each wearing many hats working as a high performing team will be much more productive than a tradition "bodies to fit the work" approach. The key is efficiency and effectiveness through maximum interface and minimum overlap. The most important element on a megaproject team is trust. The relationship of people with technically excellent leadership skills working with a lean and agile "can do" attitude with the ability to simply communicate clarity in the complexity of the tasks will lead to megaproject success.

The short list of most important elements of a megaproject:

- Safety = Religion
- People, Material, Machines
- Structure and Simplification
- Routine and Pace
- Work Breakdown Structure
- Schedule
- Cost Estimate and Tracking
- E-mail versus Database
- Database versus spreadsheets
- Everything is a contract

Types of Teams

Football, Basketball, Soccer – everyone must do their part on every play, if someone misses a block, a pick or a pass, the team can not move forward or has to be picked up by some other extraordinary part of the play.   Track, Baseball, Swimming, – individual performances in the moment are tallied together to build the team score, each individual contribution is important, but not necessarily dependent upon each other.

The Megaproject Mantra:

We will find a way. Problems must be approached from what can be done versus the traditional "here are all the things that might get in the way" attitude.   The team can not believe in the no win situation.   Like Captain Kirk, gut feel and intuition drive the decision, however, Mr. Spock's logic of the situation must be considered. Everything is built on trust. Trust - Without Mr Spock, Captain Kirk might be just reckless and egotistical. Harvesting this balance leads to success. The relationship is built on trust.

The Biggest Megaproject Fails

- Not simplifying communication
- Poorly developed analytical measurements
- Missed cost estimates
- People, material and machine schedule disconnects
- The squeeze for time by acceleration on the fly
- No quality control on the design
- Running pilot plants for time versus purpose
- PHA complexity versus purposeful product
- Pride in defending a position until it explodes
- Not understanding the feedstock characterization variability
- Not understanding the finished specification
- Operations internal pride versus external teamwork

Megaproject Methods and Culture

On a megaproject it is critical to articulate the vision clearly. Decisions must be made, direction must be set, action must be taken. Delays are exponentially damaging. There is no room for micromanaging or paralysis from analysis. Let the team do the work and mid-course correct as needed, but keep moving forward. Simplify everything. Use a simple 3 by 3 communications format. Present no more than three achievable short term goals. Describe them in no more than three points. Never focus in more than three areas at one time. If the work load is overwhelming, then pick up the pace, but d not over complicate with multiple angles to seemingly related issues. Simplification on a megaproject is critical to keeping the effort in step with the plan. Set high standards. Anything less will be amplified exponentially. Give true evaluations. Never lie. Report bad news. Do not sugar coat any thing. Take action to stop the bleeding as soon as the wound is found. Fix problems immediately. Schedule meetings are at a routine time. Only use needed time, do not fit time available. Work flow rigor actually enables more flexibility. Always assign and deliver. Preparation is a prerequisite for participation. People must be held accountable. Present by exception only do not waste time with information sharing meetings.

- Teamwork: we have each other's back
- Dynamic, energetic, make it happen environment
- Facts, rational discussion, reasonable expectations
- Mistakes are owned up to, worked through, and corrected in a positive environment
- Leadership is the focus, not management
- Action vs. endless discussion
- Open, data based decision making
- Delegate tasks, foster autonomy (no micro-management),
- Results are expected
- Simple report outs in discussion forums versus filed reports

Simple Action Accountability

Action	Deliverable	Owner	Due Date

Each team member takes personal responsibility to meet their deliverables are met. Assignments are reduced to the focused few. All decisions are documented.