

ECC BreakOut

Performance Monitoring and Metrics

Risk Management

Risk Management: Leading indicators

Craft labor shortage; weld rate failure

Productivity

Spool productivity

Wage rates

Forecasting by region, if manpower estimates are low, adjust schedule

Known that there is a shortage of capabilities or GOM workshop, not just resources

Avg age of welders is 25 in the gulf coast; which is an indicator that capability may be lower

Market forces, looking at market trends

Failure to meet deadlines: i.e. integrated schedule, deliverables, delays in FEED

During review, the high level view finds issues after the completed schedule

If there is a rate of turnover - higher rates could be an indicator

Safety Metrics and safety

Ask questions to the contractor on their hiring plans, ages and years of experience

Leading indicator of financial risk from a sub contract point of view would be late payment or non payment, look at financials; global and region

Industry does well to come up with what risks are, we fail when gathering and deciding which ones normally matter, and staying actively engaged in the risk process.

25-30 years ago, front end loading was focus, but now we understand it. We are just scratching surface of this analogous process with risk. Cultural shift still needed.

Managing the unexpected is not being handled as well. Due to lack of excellence in risk management.

Too much emphasis on low probability low impact events

Monte Carlo and box ticking at the beginning but never touch it again

How many people touch the registers

What roles are having Input from not just project leadership, but input from folks who are doing the work. "Boots on the ground"

How often you are surprised could indicate how well your processes are working

Do you have a register, are you actively working it, tracking progress, seeing material change in the status

Keeping scales updated

Not just likelihood of event occurring, but at what time

Coupling with identification and timing when it occurs

Can we do a risk look ahead like we do schedules? Look ahead on upcoming risk probabilities

A visual Key Performance Indicator (KPI) dashboard is key. Convert to a smaller amount of key risks, and change color, people start proactively responding

Risk induction is needed on projects just like safety induction

Contract Risk – Contract Milestones

Risk assessment on contract requirements: schedule cost, etc. Is it realistic? Can we meet the objectives?

Use of tools including Qualitative Analysis, Monte Carlo, CrystalBall, PDRI Index, etc.

Risk Register – living document

Development of a risk register is key to creating a proactive approach in aligning the teams' efforts. Tracking the risks and communicating mitigation plans are necessary periodically throughout the project.

Outside of safety there should be a focus on other items including client provided data, as build accuracy, contract carve-outs, etc.

Prioritize the risks from high to low producing a 'heat graph'. Responsibility for certain high probability risks can be assigned to a project team member.

Forward-looking prediction
Constructability should be considered early in the process including during risk planning.
Project Risk Register
Manage the Risk Register (i.e., update on a regular basis)
Focused more on \$ than schedule or other risks
Monte Carlo
PDRI- CII's Project Definition Rating Index
FEL/FEP/Stage-gate for project funding
Contingency Review/Management "bucket" \$ Review Monthly
Some risk registers have mitigation plans reviewed monthly
Scoring on registers: Limit choices on probabilities: 0, 25%, 50%, 75%, 100%
Cost and risk review day-long session at end of FEP/FEL/FEED
Monitor Key personnel turnover- leads and above, on each project
IPA Benchmarking- so learn from your lagging indicators- for instance, monitor turnover
Labor surveys to watch cost risk- quarterly now due to changing marketplace
Risk Management: Key areas of success
More modular fab
Change in contacting strategy
Remote execution; alternative fabrication, in changes
Seems that the action is in USA and Mexico; china is open
Pre-assembly and welding
Welding and training
Quality management plan; testing
From project management program to identify, manage, and make sure everyone understands
Project Management: Workshops, and follow on workshop
Low tech: getting everything on paper, map it out with a focus on risk
Use of technology: software such as laser scanning to identify: War room
Dedicated mentors to share on experience and train;
For those in the field; career path or high potential craft
Supervisors can pick out; strong talent retention plan
Readiness review; must have a good leadership
Cold eyes to speak from a de-biased point of view - early
How often sessions are held, how often register is updated
Regular review of register by executive and project leader
Three levels of experience: Do something, read it regularly, actively work the plans
Mirror leading indicators from safety ... Risk needs to become a key cultural habit like safety has become over the years.
Pre-task Planning (planning for every scenario) around project elements: safety, schedules, materials, mobilization, interface management - For example: Interface management including interface with management, inspections, change orders...how do you manage subs, recording meeting minutes, communications, process information, outline needs relative to procurement, supply chain, etc. - Other areas to be discussed would be labor planning, retention, permitting, use of new subcontractors that aren't familiar, etc.
Input of team is important to mitigate risks
Company organizations - Some companies have Risk Management Groups
Leading indicator: PDRI, need measurable factors that can be tracked routinely to highlight performance
Trailing indicator: Schedule, budget, safety, quality
Tracking Costs (Risk costs v. Mitigation costs, and does my contingency handle those issues)
Trending data/patterning of performance historically helps to identify areas of improvement/risk mitigation
Who reviews register: PM, Business Person/Executive Sponsor, PE, Construction, etc.

Craft Productivity

Craft Productivity: Leading indicators

What is the work plan? Can look at productivity from a standpoint of the materials - are they onsite and laid out for the planned tasks?

Manhours budget / manhours spent: note that this is a "standard measure" that most people basically understand. No additional insight discussed.

Vendor drawing submittal relative to schedule tied with return of drawings (early , ontime or late per schedule)

Can be used as a successful tool to help drive the metrics of whether or not the design is constructability ready

Is the primary focus of the project well defined i.e. is it clear if it is schedule driven, budget driven, etc?

Is engineer/ing actually looked at by construction as a deliverable

Scaffolding coordinator - is he/she clear on 2 week outlook then you can get a good indication that the project is on track

RFI volume is an indicator on the clarity of scope and activity

Job walk-through site survey - quick assessment of when see crews (tool time studies, etc) have supervisor in vicinity (It's a real time statistical sampling)

Staffing curve usually an indicator of an issue

How does the construction schedule compare to the engineering baseline schedule? When there is significant variance between the 2 schedules that is a leading indicator of potential issues

Qualitative evaluation of the project organization from the angle of how well are the project objectives defined, what team is selected to perform and the processes in place to support the team, communication mechanisms, etc

Effective indicators or measurement must drive productivity visibility down to the individual, not just the work group.

Information from monthly "Job Cost Reports" used as look aheads. (Discussion determined this to be more of a lagging indicator.)

Leading indicator for construction is percent complete of engineering before starting civil work/construction/etc.

Number of change orders, timing of changes, robust usage of design lockdown and management of change process.

Timely receipt of material (tagged items)

Number of people on job site this week and expected earned progress for the week.

Timely release of individual workforce planning work packs (include all equipment and personnel resources, so measurement of logistic effectiveness can anticipate work pack releases).

Percentage of work being dispersed to specific global locations (low cost work location)

Level of owner engagement; size of owner's team

CPI - Trends, progress report- tracking by task, scheduled audits with established expectations., forecasting

Establish a budget early, this will give something to track against

Managing and Tracking of changes, watch for trends.

Planning of the work. Management should have that day lined out to avoid downtime.

Tracking/management of materials.

Material management - in field when needed

Work front availability

Work Permitting-hot work etc

Contracting methodology and realizing payment milestones and tie to the schedule

Front end engineering deliverables to meet construction needs

Lead engineers and managers-schedule buy in

Owner changes- change management

Engineering team turnover between front end and detail design

Supervision to craft labor ratio and craft mix Rework and morale Extended schedule

Workable contract strategy,
Constructability review and owner
Craft Productivity: Key areas of success
- Advantage when EPC is with one entity - Integrated schedule vital when separate contractors for engineering and construction (necessary to have interactive planning session)
Match the plan to the metric that is key (i.e. if schedule driven you are clear on long lead equipment, etc)
Leading for construction but lagging for engineering
Leading for construction
Leading indicator - foreman availability to address needs of crews (quality, safety and EV improve the more you have foreman availability)
Can signify either over staffed or understaffed (overstaffed usually drives productivity down because actual hours spent are higher)
Need to look deeper into constructability plan and see if can separate and segregate to mitigate risk of too many interactions tied around critical path
Simulate / model can help predict (looks at skills /experience level, team dynamics, communication, etc)
Address the scope gaps prior to impacting construction. If packages have holds, get them resolved early.
Perform studies on what is the issue: permit turnaround, tool check out time. Revise procedures on future work to avoid these issues.
Incentive programs: crew of the month, monetary, small tokens- lottery ticket, TAP award (timely award for performance), public recognition
Avoid overtime, nights and weekends
Staffing management, do not put resources on when information/material is not there.
Develop work packages with construction during the engineering phase.
Good material management plan and contracting strategies.
Craft Productivity: Barriers to effectively using
Vendor data drives engineering
Lack of constructability program early on in FEL 2 (i.e. lack of engaging construction early to put input into integrated schedule)
Front End Engineering for LS bid doesn't lend itself to integrate the construction early on and each constructor has their own style to address the work
Difficult to adequately address fast-tracked projects
What is the best practice for how many hours they should be available? What is the sweet spot?
Depends on how job was bid - if a competitive bid then that sets the stage
Misuse of metrics for various sizes can be a barrier (rules of thumb for large CAPEX projects can't be applied to small CAPEX).
Metrics can be misused to drive behavior negatively (i.e. safety metrics if not used in a positive way can actually discourage safety reporting)
Too many items tied in can be recipe for disaster
Alignment from owner to engineering to contractor. The flow has to be in order and complete at each stage to avoid the lost productivity.
Utilization of tools in engineering: Constructs. Aids in establishing WP's and getting materials procured.
Owner procurement especially bulks, engineering resources

Team Effectiveness

Team Effectiveness: Leading indicators

We defined "team" for this conversation as Owner, Engineer, Suppliers and Constructor

Need communication/calibration across all team participants

Have this be a learning team

Have an execution plan with clear objectives

Survey the owner to assess client satisfaction

Have a good feedback loop back to the team on how the project is progressing

How often do they (the project team) meet and interact

Communication inside team? How informed the sponsors are. Alignment.

Continuity of team through project phases. Turnover. Transition to field.

Cost and schedule performance in FEED phase.

Open action items, open interface registry items. Timely closeout.

Quality and accuracy of reporting.

Comment ranking from deliverables.

Alignment up front. Define success.

CII Team alignment.

Communication protocol. Cultural diversity.

Looking for rhythm changes. Projects move faster and faster.

Alignment surveys.

Measuring how well the team is prepared for the next phase.

Used resources versus planned resources.

Single page metrics reports. Having a box for issues/concerns that is being used consistently.

Speed at which risks are being identified and resolved.

Third party assessments - some methods by CII, IPA, etc. (org chart vs complexity, manager's and employees resumes, etc, skill sets of team vs phase). Recommendations from experts.

Consultant software --> interviewing various people on team. Looks at communication / relations / interactions (distributed vs central)

Alignment thermometer (tool by 3rd party to gauge team alignment)

Manager observations of behaviors (what do they do when they're not working - simple social informal interactions outside of work - coffee, lunch, email tone, F2F communication when possible or reliance on email)

Purposeful interactions --> more relaxed to allow team to communicate and get to know each other. Set time to have team building (town hall and/or coffee/donuts/bagels.)

Learning best practices from each other --> having more experienced team members share their stories. Debrief and continuous improvement continuous.

What level of the team are decisions being made?

Quality of the data, classification.

Feedback (probably more lagging)

Setting up process for gauging someone's success at the beginning of the project.

Leader standard work and how well are we keeping up with the team items.

Utilization / Delegation of activities of roles to ensure all personnel used to capability

Early inclusion of all team members/ early onboarding of contractors

Unplanned turnover

Composition of team: experience, diversity (personality types included) – really look at project/stakeholder requirements and assign the right resources

Team Effectiveness Surveys – can be done regularly

Work/Meeting Attendance

Defined Communication/Honesty/Trust

On-time delivery of deliverables (Intermediate achievable milestones); Stage Gates

Reward/recognition

Team Building Activities (Beers with Jeff/Trust Sessions)

Amount of time spent together outside workplace
Definition of team goals
Leadership/Debriefs
VIPs
Number of Meetings
Succession Plan in place
Hours spent face to face
Team Effectiveness: Key areas of success
Have an execution plan with clear project objectives
Schedule with contingency on critical path
Do a thorough risk assessment
Do constructability reviews
Identify Qualitative efforts that impact success
Some Characteristics of a Highly Effective Team:
Transparency
Collaboration
People are glad to be members of the team
Innovation
Milestones are being met
Active listening to each other
A clear, shared vision for the project
Inclusivity
Right people in the right seats on the team
Owner provides leadership from the front
Consider recognition items in reports. Positive recognition. # of recognitions. Weekly recognition. Leading indicator for team performance.
Team understanding items that will not be done on a team members work list due to excessive workload. Project manager understands what is being sacrificed due to time/personnel constraints.
Owner / Contractor project manager communication.
Agreed deliverables.
Everybody understand their roles and responsibilities / knowledge of stakeholders. RACI
Right background --> right person in right position at right time
Needs to be around 25% of progress within project.
Do several of these throughout the project
Some team building exercises to help. Need to clearly set expectation, leaders needs to set expectation. It's ok to have conversations by coffeepot.
Analyzing data
More ownership
Lines up with cost, schedule and possibly some other metric for individual.
Keeps disciplined focus on agreed upon priorities and provides accountability to team and self.
Team Effectiveness: Barriers to effectively using
Items being worked on in the wrong phase.
Distracted project manager. Time leader spends with team members.
Absence of leadership. Need an effective leader.
Takes a while for team to come together. Continuity through phases is important.
Will mitigation of issues recognized be supported? Is the disruption to the project balance the gain of potential improvement. If manage changes in personnel during transition from one project phase to next, less loss to overall knowledge. Hiring , timing, availability of personnel.
Trouble breaking cliques that form within teams....cultural barriers can impact this. Difficult for larger projects. Start with smaller teams and expand. Location. People who leave a team and then later return.

lack of feedback loops from maint back to design teams. How to make sure you get feedback and make continuous improvements? Many concerned about "legal" implications so lessons learned get watered down.

Quality of data

Timeliness of data

Too qualitative to measure

Team Effectiveness: Takeaway

Our table's 'predictive metric' idea: Have a survey tool for measuring how things are working vs. how the team would like for them to be working; capture suggestions for improvement; then have a facilitated meeting to address the gaps.

Continuity of personnel with clearly defined goals and responsibilities.

Effectiveness and frequency of communication.

Affirmative leadership / Team recognition / Regular Acknowledgement. This was selected for presentation to the larger group.

Composition of team: experience, diversity (personality types included) – really look at project/stakeholder requirements and assign the right resources. Included in FEL scores

Team Effectiveness Surveys – can be done regularly

Work/Meeting Attendance

Defined Communication/Honesty/Trust

Succeed by: Doing these things at optimal times – end of stage gates/key project milestones; communicate action plan to address gaps