INTERACTIVE PLANNING

Bridging the GAPS between FEP & Execution

Presented by John Fish Feb 18, 2015
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/S & B Engineers and Constructors, Ltd.

HOUSTON BUSINESS ROUNDTABLE

4-A's of SAFETY

1. ACCEPT
2. ASSESS
3. ADDRESS
4. ABORT

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INTERACTIVE PLANNING


BRIDGING THE GAPS in FRONT END PLANNING & EXECUTION

FB&D Guide to validate the execution plan For the NEXT PHASE and reach stakeholder alignment on team commitments to achieve project success.

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TEAMBUILDING & ALIGNMENT


USING INTERACTIVE PLANNING as Structured Process to hand off a Project from One Phase to the Next

FEP2 FEP3

All Stakeholders in the same room talking about how to execute the project

NO  SILLY GAMES

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OUTLINE


- Introduction to Interactive Planning
- Benefits – Why is this important
- Focus on Inputs
- When to Conduct BRIDGING THE GAPS
- Methodology

Definitions


- **INTERACTIVE:**
  - **involving the communication or collaboration of people or things**
  - **mutually or reciprocally active**

OBJECTIVE: Get the key stakeholders ENGAGED and talking to each other in the PLANNING activities

Definition: Plan

plan

- A scheme, program or method worked out before hand for the accomplishment of an objective; a plan of attack
- A proposed or tentative project or course of action.
- A systematic arrangement of elements or import parts; a configuration or outline.
- Use the preliminary Project Execution Plan

Planned, Planning

- To formulate a scheme or program for the accomplishment, enactment, or attainment of a plan
- To have as a specific aim or purpose
- To draw or make graphic representation of

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Interactive Planning Definition

An **interactive** team approach that engages **ALL key Stakeholders**

in the development and

sequence of critical events and activities that must occur to best accomplish the

project and business objectives.

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ALIGNMENT & BUY IN

The activity of PLANNING is more important than the PLAN it produces.

ALL stakeholder must have have a part in its formulation.

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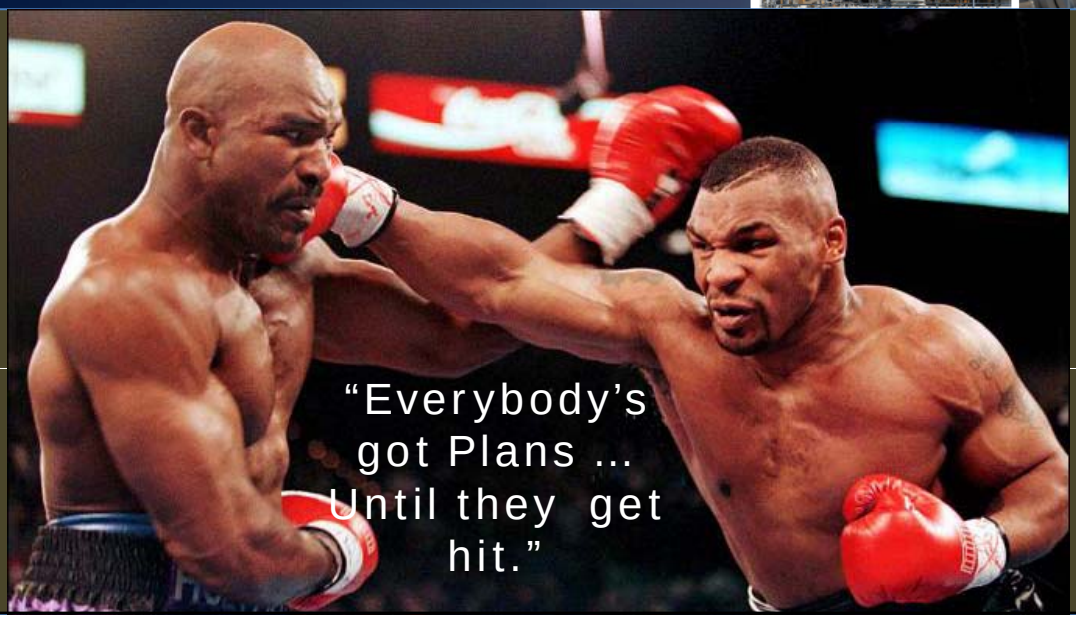
Mike Tyson on Planning



WHEN? Ensure we have enough definition to plan critical activities for the next phase.

At the handoff between FEP2 & FEP3

Approximately halfway through FEP3 to Validate Execution Plan

Start of FEP2

May want to REVISIT original plan

FEP1 FEP2 FEP3 Detailed Engineering & Construction

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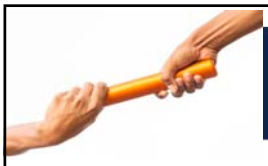
HAND OFF FEP1 to FEP2



New Team Members

Business to Process Selection

Business/Operations handoff to Process and Specialists Develop Alternatives and Select the option that best meets the business objectives

FEP1 FEP2

1-1.5% TIC

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FEP 2 Stage Gate Process Alternative Selection


Primary Goals	Objectives	Deliverables	Estimate Quality
Select the preferred process and technology options Validate to make sure the project will still meet business objectives	• Identify alternatives • Define functional scope • Initiate project execution planning • Reduce uncertainties/risks • Identify preferred alternative(s) • Test against business objectives • Plan for next phase	• Process Design Basis • Process Technology Selection • PFD's, P&ID's, Plot Plans • Preliminary Equipment List • Key Infrastructure Definition • Permitting Plan • Project Execution Strategy • Tech Assurance Strategy • Procurement Strategy • Project Controls Plan • Equipment Factored Estimate Project Schd. • Best Practice Plan	+/- 30% Estimate

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Review of Deliverables List


YPO Training | *How to Schedule a Project*

FEL 2	During this project selection stage, disciplines will start outlining the scope to give to estimating for a +/- 30% Estimate. The estimate range will vary based on the quality of the scope given to estimating.

Discipline	FEL 2 "Project Selection" Deliverables	Duration	Description
Process	Process Flow Diagrams (PFDs)	2	Overview drawings to show the process function
Process	Piping & Instrument Diagrams (P&IDs) Redlines	4	More detailed version of PFD (Conceptual)
Civil / Structural	Soils and Hydrology Data	2	aka Geotechnical report providing informaton to CSA for foundation design.
Civil / Structural	Steel & Foundation Simple Sketches	2	Sketches used for estimate
Piping	Site Plan	2	General Layout of surrounding area
Piping	Plot Plan	2	General layout of equipment
Piping	Piping Routing	2	Deliverable to estimating that gives estimate lengths of pipe
Mechanical	Equipment List	2	Provides list of equipment along with process data for budgetary quote
Instrument / Electrical	Conduit / cable schedule	2	Spreadsheet showing power and instrument cables
Instrument / Electrical	Area Class Drawing	2	Drawing showing different hazard classifications around equipment
Procurement	Equipment budgetary pricing	2	Early equipment pricing (Typicaly +/- 30%)
Construction	Construction Support of Estimate	4	Construction provides constructablity support as well as input to estimating
Estimating	Class 3 estimate	2	Estimating produces a +/- 30% TIC cost

DEVELOP A PLAN TO PRODUCE THE REQUIRED DELIVERABLES

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HAND OFF FEP2 to FEP3

New Team Members

Business & Process Selection
to
Execution Planners
& Scope Definers

All Discipline Engineering Leads
Project Management Team
Operations, Maintenance,
Subject Matter Experts,
Procurement & Construction

FEP2
1-1.5% TIC

FEP3
5-6% TIC

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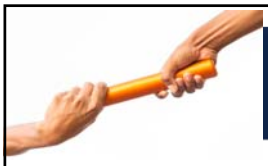
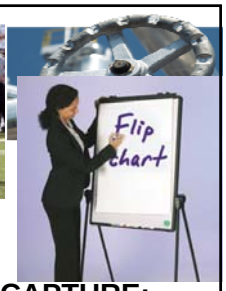


HAND OFF FEP2 to FEP3

AGENDA



SAFETY TOPIC QUALITY TOPIC

- **Facility Information**
- **Introductions – Capture Expectations**
- **Overview of Agenda**
- **Ground Rules – How to behave and contribute**
- **Business Drivers**
- **Process Overview**
- **Introduction to Interactive Planning**
- **Begin the process**

CAPTURE:
- **Expectations**
- **Risks**
- **Concerns**
- **Action Items**

FEP2
1-1.5% TIC

FEP3
5-6% TIC

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FEP 3 Stage Gate Process

Primary Goals	Objectives	Deliverables	Estimate Quality
Complete Scope Definition to ensure Project: 1. Will Meet Business Objectives 2. Can be executed with a degree of certainty.	• Fully define scope, cost and schedule • Develop detailed execution plan • Generate risk-weighted estimate and economic strategy • Test against business objectives	• P&ID's, UFD's • One-lines, Area Class • MOC • Equipment List • General Arrangement • Soils Investigation • Piping Line List, Tie-in List • Instrument Index • Constructability Program • Project Specifications • Permit Submittal • Detailed Est/Cash flows • Integrated EPC-S/U Sched. • Funding AFE/Resource Plan • Benchmark Assessment	+/- 10% Estimate

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Review of Deliverables List

YPO Training | ***How to Schedule a Project***

FEL 3	The define phase will determine if a client sees a project economically acceptable to proceed to detail engineering. The +/- 10% estimate will set a firm budget for the EPC contractor and be the basis for any changes to the project moving forward.

Discipline	FEL 3 "Scope Definition" Deliverables	Duration	Description
Process	Piping & Instrument Diagrams (P&ID IFD)	2	Drawings showing the process description, pipe specs, pipe insulation, mechanical equipment, instruments, and controls system diagrams
Civil / Structural	Road / Paving Sketches Updated	2	Site level, Access routes to equipment during construction and operations
Civil / Structural	Drainage and UG Sewer Preliminary Skecthes Updated	2	Stormwater and process drainage plan
Civil / Structural	Civil & Foundation Simple Sketches Updated	2	Equipment / support foundations and paving
Civil / Structural	Structural Steel Simple Sketches Updated	2	Structural steel needed for piping, equipment and I/E
Piping	Estimate ISOs	2	Preliminary sketches from hand or generated from a model
Piping	Plot Plan	2	IFD Plot Plan with preliminary equipment sizing
Piping	Line List	2	List showing piping with additonal specification, insulation based on process characteristics.
Mechanical	Rev C Datasheet	1	Detailed datasheet from process data
Mechanical	Sized Equipment List	2	List of all Mechanical equipment with detailed process information
Instrument / Electrical	Instrument Index	1	List of instruments on the project
Instrument / Electrical	Cable Routing Diagram/List	1	Preliminary Routing for E/I cables and wiring. Contains sizing information
Instrument / Electrical	Instrument Loop Count (I/O)	1	Count of wired instruments with destinations
Instrument / Electrical	Motor List / Load Summary	1	Electrical load information
Procurement	Instrument Firm Quotes	1	Quote to purchase Instruments
Procurement	Mechanical Firm Quotes	1	Quote to purchase Equipment
Construction	Temporary facilities plan	2	Construction trailers, warehouse, utilities, parking... etc
Construction	Estimate Support	4	Provide engineering with constructability support, equipment needs for construction and estimate input
Estimating	Class 2 Estimate	2	Provide client with +/- 10% estimate to start Equipment purchase, Detail Engineering, and Construction.

DEVELOP A PLAN TO PRODUCE THE REQUIRED DELIVERABLES

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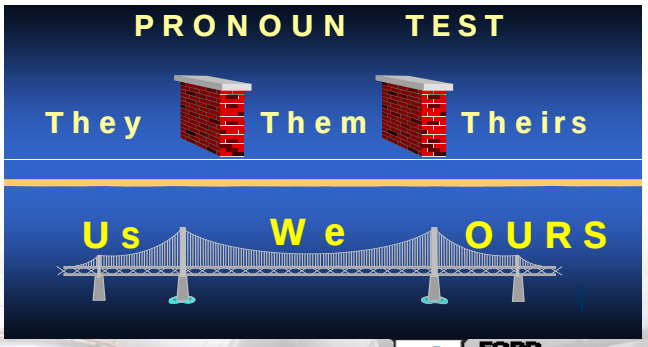
Ground Rules

- Active Participation
- One person talk at a time
- Challenge Assumptions
- Voice Concerns
- Look for a better way
- Ask for Clarification
- HELP TO STAY ON TRACK
- Turn off Cell Phones TURN to STUN!!!!!!
- Timely breaks
- Treat others with respect
- Have Fun!

PRONOUN TEST

REPLACE



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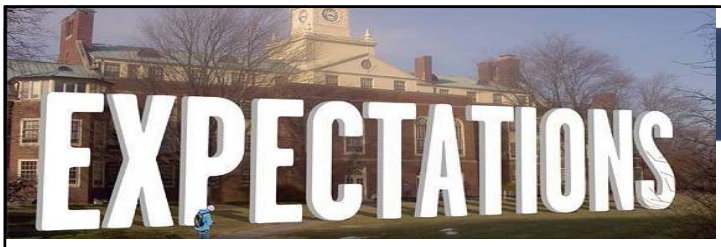


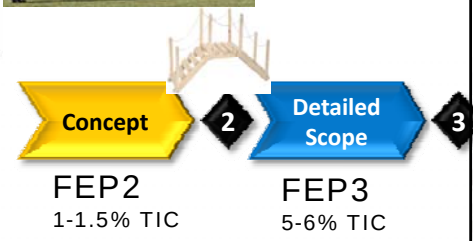
Quality: Meeting the Customer requirements and EXPECTATIONS

Encourage Stakeholders to talk about THEIR EXPECTATIONS

HAND OFF FEP2 to FEP3

BUSINESS DRIVERS

- Why are we doing this project?
- Why is it important?
- What is the dollar impact to Bottom Line?
- Cost, Schedule or Performance (Pick 2)



PROCESS OVERVIEW:

- What are we trying to achieve?
- What are the hazards?
- Potential Barriers
- Risk Identification

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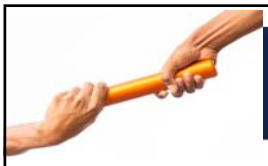
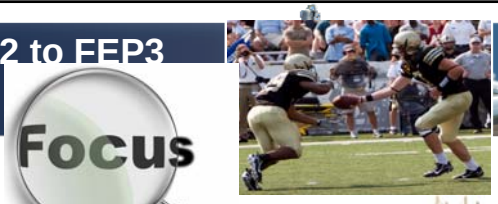
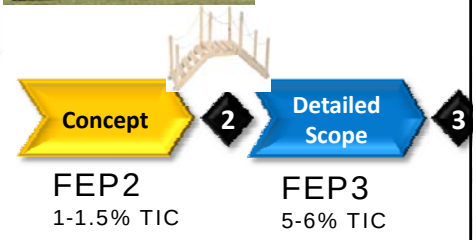
HAND OFF FEP2 to FEP3





PLOT PLAN w/WBS

- Physical Areas
- Phases (preTA, TA, Post TA)
- WBS structures



PROCUREMENT:

- Must have orders identified
- Identify Process/Project Critical Items
- Early/FEP purchases
- Strategy Defined for Each order
  - Sole Source, Comp Bid, MSA
- Procurement Milestone Planning Defined
- Contracting Strategy Defined

RISK REGISTER

Capture Risks as identified.

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Procurement Milestones

SCHEDULE ALERT RESPONSIBILITY

1. The Requisitioning Engineer and Buyer are responsible for identifying when an item or requisition milestone will not be made according to the Target Schedule. This includes a recycle for any reason.
2. This must be communicated to Project Management as soon as a potential slip is identified.
3. Use the Schedule Alert Form to communicate this information to Project Management.

MANAGEMENT MUST BE ALERTED BEFORE A MILESTONE IS LATE.

SIMPLIFIED MILESTONE CHART FOR MECHANICAL EQUIPMENT PROCUREMENT CYCLE - PLANNING GUIDE

From Data Sheets through Receipt at the Job Site

KR Denotes Typical End of Front End Planning Secure Quotes to prepare a ± 10% Estimate

EACH BUBBLE (GATE) DENOTES AN HANDOFF

Each handoff is tracked via a Transmittal

EXECUTION PLAN

1. PROCUREMENT KICKOFF MEETING
   1. Internal - All Requisitioners, Proj Ctrls, Buyers, VIC, PM
   2. Define requirements to support the PCycle
   3. Identify milestones, approvals and durations.
2. PRE-LOAD REQUISITIONS
3. PROCUREMENT STRATEGY MEETING
   1. Client and FB&D
   2. Decide strategy (Sole Source or Bids)
   3. Select vendors
   4. Determine inspection requirements
4. PRIORITIZE and SCHEDULE REQUISITIONS
   Use the Interactive Planning Session Technique to insure the project team understands the importance and timing of each requisition.
5. LOAD SCHEDULE DATES INTO PIMS
   Use Requisition Status Reports and P.O. Production Curves to monitor progress against the original or target schedule

PROCUREMENT CYCLE = 15 - 23 WEEKS

INQUIRY PROCESS	BID TAB PROCESS	PURCHASE PROCESS
Prepare Inquiry Requisition and send to Client for Approval. Submit to vendors and receive quotes.	Condition Quotes & Prepare Technical /Commercial Bid Tab. Client specialists for review & comment. (attach quotes). Provide Clear Explanation of who is selected and primary reasons why.	Prepare Purchase Requisition and send to Client for signatures. (Attach Quotes & Cost-Schedule Report) Notify Supplier of Award. Formally Issue Purchase Order

DATA SHEET CYCLE = 5 WEEKS

Prepare Equipment Data Sheets and Secure Appropriate Client Specialist Agreement

Prepare all Specifications, drawings/sketches, vendor information requirement forms, and other attachments required to support the requisition

OPTIONAL: Either wave or perform concurrent to save schedule

Conduct Bid Review Meeting on major equipment BEFORE preparing the final Purchase Requisition

Client PM will Approve Requisitions for low bidder. Attach Quotes & Cost/ Schedule Report.

Initiate Spare Part Mgmt

EXPEDITING/INSPECTION CYCLE

VENDOR INFORMATION | INSPECT & RECEIVE

Process Engineer or Client initiates Equipment Data Sheets

Issue To the Client Specialist for Comment OUT RTN

To Mech.

Issue To the Client for Approval OUT RTN

Inquiry to Client to Approval & Signature OUT RTN

Inquiry. Requisitio to Purch.

Inquiry to Vendors OUT

Quotes received from Vendors TO Engr RTN

Send Tech Bid Tab to Client Specialists for Review & Comment

10 Days Vendor to Rtn new terms

Purchase Requisition to Client PE/PM for Signature OUT RTN

Transmit Purchase Requisition to Buyer

Notify of Award & Issue PO to Vendor

Copy to Client Specialist @ Rtn to Vendor

Inspection to conduct Pre-Fab Mtg as Reqd

Rcv. VI

Rtn. VI

Rcv Final

Inspect at jobsite

Receive at jobsite

Finalize Vendor Data Transmit Equip Folders

BEGIN → AO → AR → B → CO → CR → GO → GR → H → I → J → KO → KR → LO → LR → M → N → O → OR → P → Q → R → S → T → END

DS Rev A | DS Rev B | DS Rev C | DS Rev D | DS Rev 0

Issue Data Sheets & Post to iPIMS

Locked

10-15 Std

20-35 Complex

Include Client PM for Information ONLY

5 Days Prepare Final Purchase Pkg

5 Days Sched Bid Rvw Mtg

Timely Vendor Information is Critical to support Design

Expediting Activity

Vendor Information & Equipment

Approve & Pay Final Invoice

DURATION IN WORKING DAYS	10	2	2	10	2	5	1	2	20-35	10	20	2	1	2	20-30	10	10	Varies

Bid Clarification effort, Rvw Tech, Prepare Tech/Comm Bid Tabs

More for Complex Equipment

Days from PO to 1st Pkg of Vendor Information

Internal Rvw & Rtn

Vendor Return as Certified

Vendor Fabricate & Ship Inspection Trips As Agreed in Pre-Fab or Inspection Plan

NOTE: DAYS ARE SUGGESTED AND MUST BE DEFINED AND AGREED UPON FOR EACH PROJECT TEAM.

COMBINED CYCLE = 20-28 WEEKS From Data Sheet Appvl to Purchase

Cycle Time From KR to Purchase = 5 Weeks

LO Each bubble denotes a milestone or handoff in the process. Each handoff is a potential transaction that is tracked in PIMS.

J Yellow Denotes Critical Milestones

INSTRUCTIONS FOR USING THIS PLANNING GUIDE:

1. Use this Planning Guide to identify the steps that are required to track the Procurement Cycle for this project. *PLAN BEFORE YOU SCHEDULE!!!*
2. The steps will vary depending upon the Procurement Strategy (Sole Source, Competitive Bid) and type of equipment.
3. This Planning guide will identify the milestones and steps required to track each planned requisition.
4. Look for opportunities to skip, combine or perform steps concurrently. This will allow the Procurement Cycle to be reduced.
5. Have the team establish days required to perform each step (Use working days, but convert the Cycle to calendar weeks). The days will vary by type of equipment and the number of tags on the requisition. (i.e. a compressor will take longer than a standard pump)
6. Pay special attention to Client Approval requirements. Eliminate as many as possible. Look for ways to reduce the duration.
7. These steps and durations will be used to establish the schedule logic and durations for each requisition.

CORPORATE STANDARD | PROCUREMENT CYCLE

MECHANICAL EQUIPMENT PROCUREMENT CYCLE MILESTONE PLANNING GUIDE

By: J. Fish Date: 05/01/88 | IM-PO-WFD-101 | Rev: 8 Date: 7-15-07

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HAND OFF FEP3 for Execution

AGENDA

SAFETY TOPIC QUALITY TOPIC

- **Facility Information**
- **Introductions Roles – Capture Expectations**
- **Overview of Agenda**
- **Ground Rules – How to behave and contribute**
- **Review Project Objectives and Drivers for Alignment**
- **Introduction to Interactive Planning**
- **Begin the process**

CAPTURE:

- **Expectations**
- **Risks**
- **Concerns**
- **Action Items**

Briefly Explain the Plot Plan

- **NEVER BRING A CLIENT TO AN EMPTY PLAN**
- **Disciplines should develop straw man plan BEFORE session.**
- **May want to start BACKWARD PLANNING with Construction.**
- **See if the Engineering Plan will work – Rarely does!!!!!**

FEP3

Detailed Engineering & Construction

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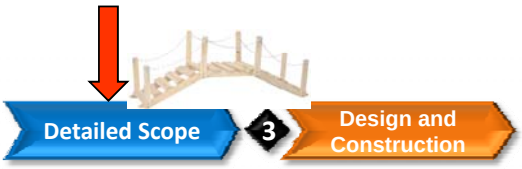
VALIDATE & ALIGN ON PROJECT EXECUTION PLAN


Approximately halfway point Of FEP 3 team should have:

1. **IFA P&ID's**
2. **Approved Plot Plan/EQUIP Locations**
3. **Procurement Execution Plan**
4. **Contracting Strategy**
5. **The …abilities**
   - **Constructability**
   - **Operability**
   - **Maintainability**
6. **Project Execution Plan:**
   - **Work Breakdown/Work PKG**
   - **Sequence**
   - **Pre-turn Around**
   - **Turn Around**
   - **Post**
   - **Early Tie-Ins**
   - **Rack Run Pipe**



FEP3

Detailed Engineering & Construction

WARNING

INPUTS MUST BE DEFINED for INTERACTIVE TO BE SUCCESSFUL

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FOCUS ON INPUTS


NOT the OUTPUTS

MANAGE THE INPUTS

VALIDATE STRATEGIES

THIS IS THE TIME TO VALIDATE THE PROCUREMENT AND CONTRACTING STRATEGIES.

Will the vendor data be here to support design? Do we have time to develop the bid packages for each contract? Will the steel/pipe be fabricated to support the field plan?

FEP2-FEP3 P&ID Management & Approval Process, Real TAG Numbers Field Survey, Conceptual Models, Early Procurement. TA's Permits, etc.

BASIS of PROJECT PLANNING & CONTROLS

GATED PROJECT DELIVERY SYSTEM

FEP2 *FEP3*

FRONT END PLANNING

DEFINE → PLAN → Estimate / Schedule

WBS
CBS

EXECUTE

Manage Change
Progress
Forecast
Cost/Schedule

ESTIMATE TOOLS:
- ICARUS Kbase
- FB&D Proprietary System
- 3D Conceptual Models (BIM)

OBJECTIVE:
1. Predictable Projects
   - On Time
   - On Budget
   - Achieve Business Objectives
2. Control Change
3. Accurate Forecasting

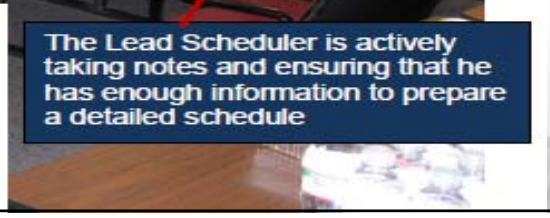
INTERACTIVE PLANNING SESSIONS

SCHEDULE TOOLS
- Primavera
- Microsoft Project
- Big Chief Tablets & Nbr 2 Pencils

iPIMS
Cost Control
Change Management
Cash Flow Projection Curves
Staffing Curves
Forecast to Complete

FEP2 to FEP3 & Approx Mid FEP 3

THIS IS WHAT IT LOOKS LIKE



LEADS need to Work Together

Team Members working together to develop THEIR PLAN

WORK FLOW PROCESS

USE A TRAINED FACILITATOR

PreMeeting Activities → **Set Up Rehearsal** → **Interactive Planning Session** → **OUTPUTS**

Identify Stakeholders
- Interview to get concerns
- Capture :
  Needs & Expectations
- Identify Key Activities

Secure facilities
Define Scope of Work
Preliminary understanding of:
- Sequencing
- Work Breakdown Structure
- Work Packaging
- Contracting Strategy

Identify Roles
Key Milestone Schedule
- Critical Dates
- Engineering
- Procurement
- Turn Around/Shut Downs
- Start and Stop Dates
- Construction Restraints

Best if disciplines can provide a Milestone schedule for this session. Session will Validate Discipline plan.

Set Up the Room
Create a Starter set w/Mgmt Team
Use best guess
Denote hrs/Quantities if available
Fill out key activities on colored Post-It notes or cards
- IFC Steel Dwgs
- Start Fab
- End Fab
- Start Erection
- Steel Erection Complete

One color for each discipline

DO NOT MAKE THE TEAM START WITH A BLANK WALL.

Make sure there is a starter set With known key activities in place. Very important not to WASTE the Client's time. Basic plan elements Should be in place BEFORE the Client enters the room.

Appoint a NOTE Taker

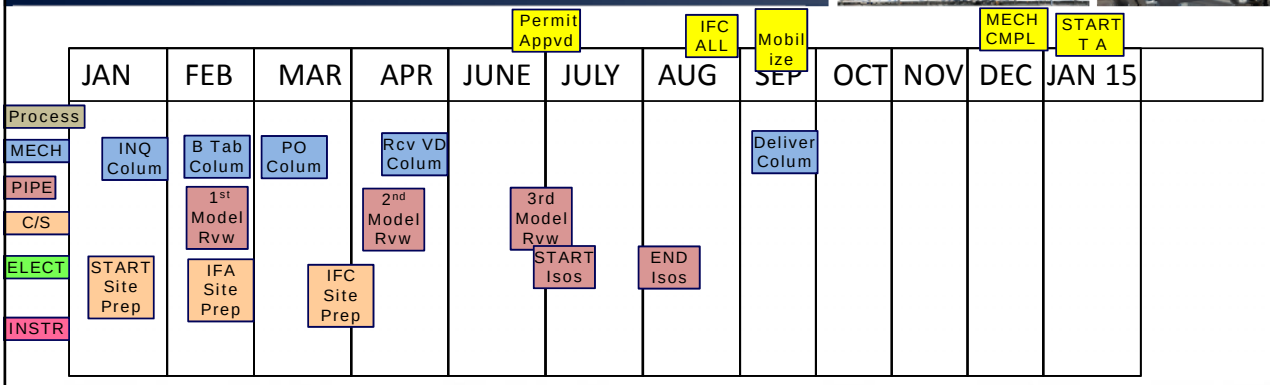
Conduct the Session
Capture Critical Issues
Identify Potential Problems
Develop an Action Item List
Capture a Parking Lot for items to address later

~~Suggested Attendees:~~
- Management Owner/Contractors
- Operations
- Maintenance
- Construction
- Critical Suppliers
- Key Subcontractors
- Planner/Schedulers

Key Activities on time line
Critical Issues Listing
Potential Problems
Action/Risk Items
Meeting Notes
A Plan that can be used to Create an execution Schedule.
FOLLOW UP!!!!!

FACILITATOR ROLE:
1. Organize and Set Up Process.
2. Ensure INPUTS are ready
3. Kick off the session.
4. Explain expectations.
5. Keep the disciplines talking
6. Question, challenge & Probe.

SET UP

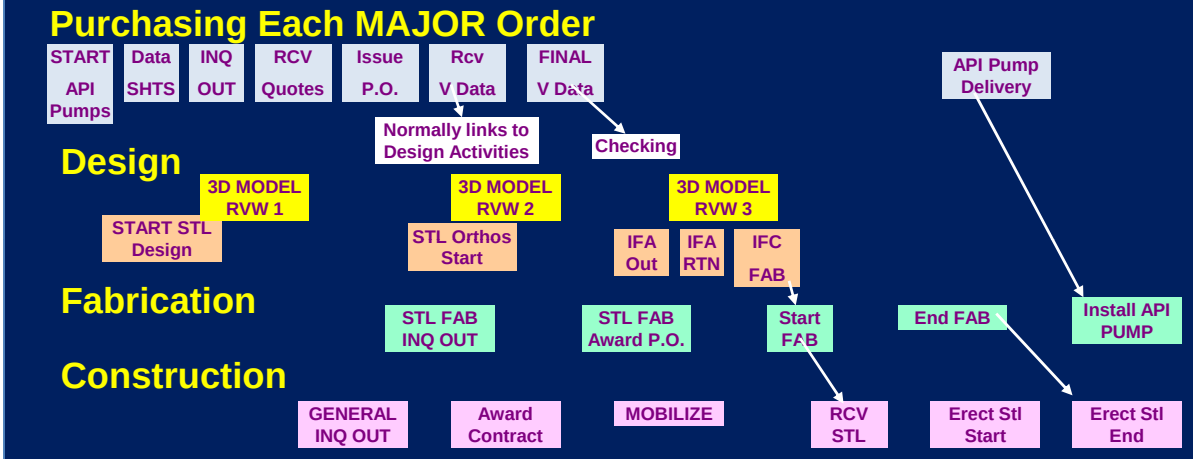


Place a Calendar on the wall.

Identify CRITICAL Milestones

Level of Detail

ONLY identify milestones required to capture the key elements.
Scheduler can fill in all the remaining steps later.



METHODOLOGY

- Create a calendar on the WALL.
- May draw horizontal lines to designate Work Breakdown Structures
- Start with a BACKWARD PLAN and work to the Front.
- Write Key Activities for each discipline on Colored Sticky Notes
- Use different colors to distinguish discipline activities.
- Pre-post key activities before the CLIENT team members assemble.
- Each discipline to explain their activities and needs.
- Allow other team members to challenge.

LEARNING: It is very difficult for disciplines or clients to visualize the entire schedule on multiple screens or pages. They need to see the entire plan on the wall to ensure buy-in.

WHEN COMPLETE


- **Review Expectations and the Plan**
- **Secure Team Commitment to meeting milestones.**
- **Have enough detail to develop a level 3 schedule.**
- **Paste IAP Chart on Wall where visible.**
- **Monitor progress.**

OUTPUT


- All stakeholders see the same picture
- Everyone has a chance to challenge

CONSENSUS
ALIGNMENT
Common Understanding
ALL have a Common
PICTURE of the plan
Scheduler has a base to work with


This is What you want to see
Team Members INTERACTING
WE DID IT!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&
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FORD, BACON & DAVIS