Creating a Best Practice for Engineering and Procurement to Support an AWP Implementation

Presenters
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Agenda

- Why is a Best Practice (BP) needed
- What are the foundations of a BP
- Guidelines to Create BP
- Rules of Credit for Engineering
- Rules of Credit for Procurement
- Auditing of BP
- Q & A

Assumption – Project is using 3D model with appropriate procedures to handle metadata (data that provides information about other data) that is aligned to CWP/EWP/PWP
Basics of AWP

ADVANCED WORK PACKAGING

Project Setup → Interactive Planning → CWPs EWP → WORKFACE PLANNING

IWPs

Front End Planning
Detailed Engineering

Construction Commissioning Start Up
Why is a BP Needed?

- **THE KEY** to successful WFP within AWP Implementation is to have Engineering Work Packages (EWPs) / and Procurement Work Packages (PWPs) provided complete and on time to support the Path of Construction on your project.

Assumption – PWP is part of the EWP Deliverable

The BP should be applicable to EP and C or EPC contracting strategies.
What does WFP need?

- EWP/PWP deliverables that provide all engineering and procurement information needed to produce IWP\Ps to execute the scope of work are complete and delivered to meet the Path of Construction.

- Confidence that forecasted EWP/PWP deliverables will be met

- Ability to easily find material status / location
Why develop BP for procurement?

- Equipment and material in range of 50% of TIC.
- Surveys show Vendor Data requirements are not clear (if even specified at all) on over 50% of Quotations and over 35% of Purchase Orders
- Ability to quickly find material status
- Vendor alignment is being overlooked
Guidelines of EP Best Practice

- Path of Construction is developed from integrated planning sessions with ALL necessary stakeholders
- Geographic boundaries of EWP/CWP align
- EWPs are mapped to corresponding CWP’s
- PWPs are mapped to corresponding EWPs/CWPs
- Deliverables meet the guidelines of AWP (CII IR 272)
- Data requirements specified during Front End
What metadata is required by AWP?

- Model material “dumps” should easily identify material (i.e., Piping) with data such as:
  - Commodity Code
  - Schedule ID
  - Engineering Work Package (EWP)
  - Construction Work Package (CWP)
  - Procurement Work Package (PWP)
  - Module number
  - System
  - Isometric
  - Spool
Why is progressing EWP important in AWP/WFP Strategy?

- The entire strategy is dependent on Engineering and Procurement providing their deliverables to meet Path of Construction.
- Contractor mobilizes and plans execution based on Engineering forecast of IFC EWP.
EWP Format

• Use Template from CII IR 272 (Vol 2, Appendix H) as guideline.

• Key items
  ○ Scope of work
  ○ Engineering deliverables (drawings, specs, etc)
  ○ BOM (all material provided by engineering and mapped to appropriate PWP to allow project to determine availability of material for IWP execution)
Progressing Engineering Deliverables?

- How does progress of each individual deliverable relate to overall EWP Progress (eg. Piping)?
  - Development of 3D Model
  - Drawings
  - P & IDs
  - Requisitions
  - Specifications
  - Pipe Stress Analysis
  - Calculations
  - Others?
Potential Rules of Credit for Piping EWP

- EWP ID’d and mapped to CWP: 5%
- Initial scope identified – line numbers: 20%
- Preliminary equipment data received: 25%
- Initial routing of lines established: 45%
- Initial bulk material (BOM) to supply chain: 55%
- Piping studies rec’d for critical lines: 60%
- Final vendor data received: 70%
- Final routings completed: 75%
- P&ID’s and LDT issued IFC: 80%
- Stress analysis for large bore completed: 85%
- Line List issued IFC: 90%
- EWP c/w all drawings/specs issued IFC: 95%
- EWP accepted by Construction: 100%
Guidelines of EP Best Practice

- Rules of Credit (e.g. For piping) should be established during Front End Planning – with focus on:
  - Final vendor data received: 70%
  - Stress analysis for large bore completed: 85%
  - EWP c/w all drawings/specs issued IFC: 95%
  - EWP accepted by Construction: 100%
Guidelines of PWP Best Practice

• Items within each PWP should be mapped to corresponding EWP’s
  
  o Eg. Initial PWP might list
    
    ➢ Item 1 – 35 units
  
  o As design progresses –
    
    ➢ Item 1  - 10 units EWP “111”
    - 15 units EWP “145”
    - 10 units EWP “242”
Guidelines of PWP Best Practice

- Suppliers should be aware of:
  - How project needs updates on procurement package by item or groups of items based on EWP.
  - Format, how and when they provide information for updating the project data-base.
Potential Rules of Credit for PWP

- Initial BOM Provided for Purchase: 20%
- PWP RFQ’s received back from vendors: 25%
- Vendors selected: 45%
- PO to vendor c/w Vendor Data: 55%
- PO includes ROS Dates(Site/Fab Yard etc): 60%
- Final vendor data received: 70%
- Shipping Dates Received (all items): 80%
- Material Shipped: 90%
- Material Received: 100%
Auditing of Best Practice

• The BP Procedure is established but must be audited during the execution of the project to ensure what was supposed to happen – actually happened.

• NOTE – research has determined that as AWP Maturity increases – the predictability of the project success increases.
Summary

- BP to incorporate Path of Construction
- EWPs and PWPs are mapped to CWPs
- Tie PWP into the EWP
- Use formats / templates in IR 272 as guidelines
- Incorporate Rules of Credit into BP
- Align your vendors with BP strategy
Thank You For Attending

Q & A