AWP Conference
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AWP Resource Readiness

Yogesh Srivastava (Co-chair) & Glen Warren (Co-Chair)

AWP Committee, COAA
Agenda

• Introductions
• Resource Readiness
• Path of Construction
• EWP Readiness Assessment & CWP Coupling Point
• Material Readiness Assessment: Maturing the Procurement Work Process by CWP (Previously PWP)
• Site Readiness: Updated WFP Rules

New work in 2018
AWP Playbooks
  • Who, When & How in AWP Implementation
Introducing Today’s Speakers

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Upfront Alignment: Pre-requisite to Resource Readiness
Path of Construction: A Key Milestone in AWP Start

- Updates on the Guideline
- Updates to the workflow
- Inputs and Outputs
## Breakdown Example

<table>
<thead>
<tr>
<th>DISCIPLINE</th>
<th>NO. OF EWP</th>
<th>DISCIPLINE</th>
<th>NO. OF EWP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthworks</td>
<td>001</td>
<td>Electrical Equip</td>
<td>208</td>
</tr>
<tr>
<td>Concrete Paving</td>
<td>001</td>
<td>Grounding</td>
<td>001</td>
</tr>
<tr>
<td>Foundations</td>
<td>016</td>
<td>Cathodic Protection</td>
<td>001</td>
</tr>
<tr>
<td>Piling</td>
<td>017</td>
<td>Electric Heat Tracing</td>
<td>268</td>
</tr>
<tr>
<td>Structural Steel</td>
<td>251</td>
<td>Insulation</td>
<td>268</td>
</tr>
<tr>
<td>Architectural Bldgs</td>
<td>004</td>
<td>Fireproofing</td>
<td>012</td>
</tr>
<tr>
<td>Mechanical</td>
<td>132</td>
<td>Instrument Cabling</td>
<td>289</td>
</tr>
<tr>
<td>Piping</td>
<td>251</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total: 1739**
The Functional Breakdown: Discipline & Trade flexibility

**Functionality Breakdown Work Break Down**

- Unit
- CWA (Construction Work Areas)
- Sub Areas

**WORK PACKAGES / COMPLETION / TURNOVER**

- PWPs
- EWPs
- CWPs
- IWP Executed
- TCPs / Sub Systems
- System Packages

**Functional Control Work Break Down**

- Engineering Design
- Construction Planning
- Field/Mods Execution
- Start of Progressive Turnover
- Sub system/Tag based Turnover
- Turnover Completion
The Functional Breakdown: Discipline & Trade flexibility

- **PROJECT**
  - UNIT 10
  - UNIT 20
  - Construction Work Area - A
  - Construction Work Area - B

- **Sub Area**

Convergence matters: Job based & Activity based coding / costing

- **Functional Control Work Break Down: Dynamic**
  - **EWPs**
    - Engineering Design
  - **CWPs**
    - Construction Planning
  - **IWP**s
    - Field/ Mods Execution

Single Discipline / Trade based: Example - Civil, Structural, Piping, Electrical, Instrumentation, Heat Tracing
**Time & Discipline**

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Construction plan</th>
<th>Package execution</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWP issued from engineering tied to schedule logic</td>
<td>EWP formal issue milestone</td>
<td>WorkFace plan approved and construction commences</td>
</tr>
<tr>
<td>float (default)</td>
<td>Package build time (formal trend for change in milestone date)</td>
<td></td>
</tr>
</tbody>
</table>

- Time for planning
- Ownership / ‘Custody’ transfer of EWP > CWP
- Bill of Material
- Constructor - Check the EWP BOM!
Principle: EWP to CWP

Sample representation of EWP groups and CWP in schedule:

EWP packages:
- EW-BA1-101A-PR-SS
- EW-BA1-101B-PR-SS
- EW-BA1-101C-PR-SS
- EW-BA1-101D-PR-SS
- EW-BA1-101E-PR-SS
- EW-BA1-101F-PR-SS

EWP group: EW-BA1-101 A/B/C/D/E/F

Last EWP completed in group:
- EW-BA1-101A-PR-SS (12 weeks)
- EW-BA1-101B-PR-SS (12 weeks)
- EW-BA1-101C-PR-SS (12 weeks)
- EW-BA1-101D-PR-SS (12 weeks)
- EW-BA1-101E-PR-SS (12 weeks)
- EW-BA1-101F-PR-SS (12 weeks)

First CWP (Min 12 weeks from last EWP):
- CW-BA1-101A-PR-SS
- CW-BA1-101B-PR-SS
- CW-BA1-101C-PR-SS
- CW-BA1-101D-PR-SS
- CW-BA1-101E-PR-SS
- CW-BA1-101F-PR-SS

Work execution of CWP packages:
- EW-BA1-101A-PR-SS
- EW-BA1-101B-PR-SS
- EW-BA1-101C-PR-SS
- EW-BA1-101D-PR-SS
- EW-BA1-101E-PR-SS
- EW-BA1-101F-PR-SS

Representation in schedule:
- EWP Group: EW-BA1-101 A/B/C/D/E/F
- FS 12 wks
- FS 12 wks
- FS 12 wks
- FS 12 wks
- FS 12 wks
- Min 12 weeks
Engineering Design Deliverables
The EWP Readiness
CII-COAA Detail Engineering

STAGE II
Detailed Engineering

Schedule Development

Engineering

Detailed Construction Schedule

Detailed Level 3:
E – by discipline, by EWP
P – by commodity, by construction need date

Final Level 3

Preliminary Level 3:
C – by CWP

Execute EWP Standard
Engineering: Progress Mile Stones

3.1 Home Office Service:

<table>
<thead>
<tr>
<th>a) Engineering deliverables / documents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Progress Gate</strong></td>
</tr>
<tr>
<td>• Start of Engineering deliverables</td>
</tr>
<tr>
<td>• Submission of Engineering deliverables/ documents to COMPANY for approval / review / comments</td>
</tr>
<tr>
<td>• Resubmission of Engineering Deliverables to COMPANY after incorporation of comments</td>
</tr>
<tr>
<td>• Final approval / acceptance of engineering deliverable / documents</td>
</tr>
</tbody>
</table>

*Note: 2% of engineering total weight shall be allocated to Project Final Documentation and As-Built Drawing.*

Confidential – Do not distribute, for HDEC internal use only.
What is individually progressed now?

Typical Drawing Rules of Credit

• Initial setup from 3D Model___________ 25%

• Checking complete______________________ 60%

• Issue for Internal Review_____________ 75%

• Issue for Client Review_______________ 85%

• IFC________________________________100%
EWP Readiness:

Issued IFC

ENGINEERING WORK PACKAGE (EWP)

WORK COMMENCES

This lag gets squeezed and usually CWP starts late

CONSTRUCTION WORK PACKAGE EXECUTED (CWP)

How do we improve this interface
Vendor Data needed to complete
EWP delivered late or incomplete

• Final Vendor Data not received
• Line routing not complete
• P&ID not IFC
• Line Designation Table not IFC
• Isometrics not complete
• Stress analysis not done
• 3D model not complete for EWP scope
• BOM not complete

PROCUREMENT WORK PROCESS

SUPPLIER EQPT &/OR MATERIAL
# EWP Readiness

<table>
<thead>
<tr>
<th>GENERAL</th>
<th>%</th>
<th>CUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Scope Identified</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Initial Design (60% Model)</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>Preliminary Vendor Data Received (Where Applicable)</td>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td>Preliminary MTO/BOM (Bulks) to Supply Chain</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Final Vendor Data Received / Checks (Where Applicable)</td>
<td>5</td>
<td>55</td>
</tr>
<tr>
<td>Model Finalized (90%)</td>
<td>15</td>
<td>70</td>
</tr>
<tr>
<td>Deliverables (incl. final MTOs, etc)</td>
<td>15</td>
<td>85</td>
</tr>
<tr>
<td>EWP Reviews (Incl Eng Checking / IDR(SQK) / IFR, etc)</td>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>EWP c/w Drawing/Spec/MTOs Issued IFC</td>
<td>5</td>
<td>95</td>
</tr>
<tr>
<td>EWP Accepted by Construction</td>
<td>5</td>
<td>100</td>
</tr>
</tbody>
</table>
EWP Readiness & CWP – the coupling point

• Readiness is **workflow based** (It relies on the activities and contributors to the EWP (not just produced deliverables within it))

• The readiness assessment tool **can be easily modified** to suit differing workflows

• The tools can be applied in a **generic** form (all disciplines are the same) **or be discipline specific**

• Readiness can be **assessed by anyone**

• Meant to help **facilitate dialogue** not to police or punish
Material Readiness
Improved Integration of the Supply Chain in Materials Planning and Work Packaging
A Complex, Global Supply Chain

Siloed stakeholders impedes visibility

Disparate systems | Asymmetric data | Misaligned incentives
A Complex, Global Supply Chain

- What's the installation status of Unit X?
- I already told you – It shipped last week.
- Has everything shipped for PO #123?
- What's the packing list status of Unit X?
- I’ll send you a copy of the packing list. AGAIN.
- Does anyone read my fabrication status report?
- Why is the client always changing priorities at the last minute?
- Why can’t construction ever give me more than 1 day’s notice when they need material?
- What shipments are arriving today?
- What ship materials are loose?
- Are the materials for IWP-123 available?
- You didn’t issue me all the material.
- Who moved the valves without telling anyone?
- Where is Spool #PS-1001?

Where are the ship loose materials?
PWP: The Procurement Work Process

- Improvements in Process, Technology and Supplier
- Demand driven Materials Requirement Planning
- RT 344, improvement in the Visibility across the long process in SCM
Improve the Materials Visibility across Engineering, Supply Chain and Construction process

• Improving confidence in materials from a process point of view and meeting the key dates
• Clear identification of Roles and Responsibilities through out the procurement to installation process
• Improve management of Changes, early identification of information that is not known and ensuring smooth flow
• Improve visibility in logistics, shipping and receiving,
Rethink: What are you buying?

1. The Item / Commodity
   - Needed later per the RAS Date

2. The Vendor Data
   - Needed earlier as per RAV Date
Demand Driven Materials Requirement Planning

• Typical forecast based methods from Engineering to Supply Chain, Vendor, Site

• Demand driven method: Site requirement variations, Supply Chain Office to the Vendor

• Need Systems for:
  • Greater Collaboration
  • Improved Connectivity
  • Enhanced Cognitive abilities
On-site Readiness
Updated WorkFace Planning Rules

• Original Text by COAA in 2003: Developed prior to AWP
• Old rules emphasized hours and number of planners

• Updated draft to be ratified in 2018 and published again
• Includes AWP approach
The People Mindset Readiness
Mindfulness & Productivity

- Improvements in the assessment framework
- Implementation in project teams & work site
- Leadership & Change management
• On an average we have 50,000 thoughts each day
• 98% of the thoughts are the same as yesterday
• 80% of those are negative.
• And the things we repeatedly do become automatic and our second nature.

On an average, 47% of the time, we are distracted – HBR Study

Operating in Error!
Distractions: Twice as more in 10 years!

- As humans we are no longer cognitively alert as we were 10 years ago

**AVERAGE ATTENTION SPAN**

- 10 years ago: 20 seconds
- Now: 10 Seconds

**SHEER VOLUME OF DATA EXPLOSION**

Human- and machine-generated data are already experiencing a growth rate that is 10 times faster than that of traditional business data, while machine data is increasing at 50 times the growth rate.

*Source: Dr. Cindy Gordon, CEO SalesChoice Inc*
We are constantly DISTRACTED....

This decrease in human cognitive focus has been fueled by mobile connectivity. While we are plugged in 24/7, our productivity is being severely impacted by our cognitive dissonance.
The bridge to productivity supported by the pillars of knowledge and skills is weak unless supported by the arch of desire i.e. teams wanting to be more productive!
People bring Mindfulness

Existing HSE Orientation and Training Programs

A LEAN Mind (Mottainai) culture for every worker orientation

Complete & aligned package based execution: AWP/WFP fundamentals

Leverage by Enhanced Onboarding Program
Resource Readiness Conclusion

- Engineering Readiness
- Material Readiness (PWP)
- Onsite Readiness
- People Mind set Readiness

POC
Q & A

Question and Answer Period
Thank You!