AWP as a Best Practice: Where We Are, Where We’re Going

Kim Allen, CII
Bill O’Brien, University of Texas
Eric Crivella, Bentley Systems
What is Advanced Work Packaging?

Work planning that emphasizes construction requirements

ADVANCED WORK PACKAGING

Project Setup → Interactive Planning → CWPs EWPs → WORKFACE PLANNING → IWP

Front End Planning  Detailed Engineering

Construction  Commissioning  Start Up
Best Practice

A process or method that, when executed effectively, leads to enhanced project performance. To qualify, a practice must be sufficiently proven through extensive industry use and/or validation.

- Front End Planning
- Alignment
- Constructability
- Lessons Learned
- Materials Management
- Team Building
- Partnering
- Project Risk Assessment
- Planning for Start-Up
- Planning for Modularization
- Advanced Work Packaging
- Quality Management
- Change Management
- Disputes Resolution
- Zero Accidents Techniques
- Implementation of Products
- Benchmarking
AWP World-Wide Adoption
Project Performance with AWP

<table>
<thead>
<tr>
<th>Feature</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>Up</td>
</tr>
<tr>
<td>Cost</td>
<td>Up</td>
</tr>
<tr>
<td>Safety</td>
<td>Up</td>
</tr>
<tr>
<td>Schedule</td>
<td>Up</td>
</tr>
<tr>
<td>Predictability</td>
<td>Up</td>
</tr>
<tr>
<td>Quality</td>
<td>Up</td>
</tr>
</tbody>
</table>
Resources

CII Volumes
RT 272 + RT 319

CII Community of Practice
Virtual Meetings

Education
Conferences and Training
CII’s Reinvented Knowledge Base – A Value Transformation

- 700 research publications and tens of thousands of pages of knowledge
- 200 Topic Summaries
- 21 Integrated Knowledge Summaries
- 1 IKS for each Knowledge Area
- 1 Topic Summary for each Research Team
- Research - Reviewed, summarized, tagged, and integrated
CII’s Reinvented Knowledge Base – a Game Changer

• Easy navigation from new portals
  – By knowledge area, phase, function/role, 10-10 input measure, best practice, and multi-criteria filtering
  – Quick, accurate, targeted searches

• Delivers CII Knowledge in multiple ways to support member needs:
  – Desktop/laptop
  – Mobile/tablet
  – Print version for summaries
  – Download publications directly
The Knowledge Base Home Page

Six portals plus advanced search empowers members to explore, connect, and engage with the CII body of knowledge.
The CII Knowledge Base highlights the key findings and essential tools that drive project predictability and business value. Now, members and industry participants can go online and quickly discover project practices of highest priority to them without needing to read 300 page reports. Going forward, the Knowledge Base provides the foundation for CII to develop tools and resources for specific industries and project types.”

Stephen Mulva
CII Future Direction – Sector Focus

• Reorganizing CII into industry sectors allows for improvement in the uptake and implementation of CII research when specifically applied to projects in each sector.
  – Power, Utilities and Infrastructure
  – Upstream, Midstream, and Mining
  – Downstream and Chemicals
  – Healthcare and Facilities
  – Manufacturing and Life Sciences

• We see greater opportunity for diversity of thought and innovation coming from research developed by different sectors.
CII Future Direction – Research Focus

From an overarching perspective, CII will take the lead to undertake the R&D to create a new operating system for the capital projects business in the next 3-5 years:

• Encompass practices and best practices (such as AWP) from CII’s first 33 years
• Distinguish activities best suited to the project, program, and enterprise levels
• Accommodate managerial flexibility: just as software development has progressed from “waterfall” to “agile/scrum” – capital projects must go from “stage gate” to “what’s next”
• Incorporate other areas of the business from capacity management to finance, tax, legal, accounting, HR, etc.
• Deliver 30-40% cost and 50% schedule reduction as primary objectives
WHERE ARE WE GOING WITH AWP?

Bill O’Brien
Maturity Model – Case Study Evaluations

Results:
- 60 ratings on 15 different projects.
- Independent ratings (RT319 experts).
- Two dimensions of analysis:
  - AWP Maturity
    - A. Process Adherence
    - B. Organizational Alignment
    - C. Contract Integration
  - Project Performance
    - A. Productivity
    - B. Cost
    - C. Safety
    - D. Schedule
    - E. Quality
    - F. Predictability
It’s all about implementation

• One note on sample cases: all tried to adhere to AWP principals

• A cautionary tale: trying AWP without proper consideration
  – Field engineer’s story

• Are we ready?
  – Alignment results
RT310: Alignment - Startling Findings

• 50% lack a procedure titled ‘team building, alignment, or chartering’
• 80% do not consider cultural or regional differences in their processes
• 53% lack procedures that address continuity of key roles across project phases
• 60% do not address mechanisms for communication in the kick off meeting
• 60% do not get input from Owner Operations, Procurement or Construction when developing the schedule
So what next for research and practice

• ROI
• Extension into the supply chain
• Field implementation
Sub-Problem 1 – What is the effect of AWP/WFP on schedule, cost performance, field productivity and predictability for stakeholders?

Sub-Problem 2 – What effect does the use of AWP/WFP have on total rework rate on projects?

Sub-Problem 3 – What effect does the use of AWP/WFP have on Total Recordable Incident Rates on projects?

Sub-Problem 4 – What effect does the maturity of the AWP/WFP program have on indirect spend?

What is the variance in total return on investment for organizations that have implemented AWP/WFP in relation to the maturity of the Advanced Work Packaging Program?
## Current visibility level of material location in the Supply Chain

<table>
<thead>
<tr>
<th>Location</th>
<th>None</th>
<th>Low</th>
<th>Fair</th>
<th>Adequate...</th>
<th>High...</th>
<th>Extremely High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offsite (fabrication shops)</td>
<td>17%</td>
<td>35%</td>
<td>21%</td>
<td>15%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Offsite (tier-1 suppliers)</td>
<td>17%</td>
<td>28%</td>
<td>30%</td>
<td>17%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Off-site (tier-2 suppliers)</td>
<td>10%</td>
<td>25%</td>
<td>30%</td>
<td>22%</td>
<td>11%</td>
<td>2%</td>
</tr>
<tr>
<td>Off-site project lay-down yard/warehouse</td>
<td>4%</td>
<td>19%</td>
<td>24%</td>
<td>25%</td>
<td>18%</td>
<td>5%</td>
</tr>
<tr>
<td>Transporting/shipping</td>
<td>20%</td>
<td>29%</td>
<td>23%</td>
<td>17%</td>
<td>7%</td>
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<td>15%</td>
<td>17%</td>
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<td>15%</td>
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</tr>
<tr>
<td>On-site (work-face)</td>
<td>9%</td>
<td>14%</td>
<td>37%</td>
<td>18%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitting sites</td>
<td>30%</td>
<td>12%</td>
<td>20%</td>
<td>27%</td>
<td>9%</td>
<td>2%</td>
</tr>
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<td>Ports and barge sites</td>
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CII RT344
### General Foremen Time Allocation - Comparison between Projects A and B

#### General Foremen Time Allocation - Project A (AWP)

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<tr>
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<td>Meetings - Client/Coordination/Scheduling/Lock Ahead</td>
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<td>29</td>
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<td>16</td>
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<tr>
<td>Safety Related Activities - Meetings/SHA/Development/Inspections/Action Items/Sign/Review FLHA/As</td>
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<td>8</td>
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<tr>
<td>Constraint Mgt. - Ensure FM has all Crane Support/Spreader/Equipment</td>
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#### General Foremen Time Allocation - Project B (Traditional)

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**Preliminary results**
FOREMEN TIME ALOCATION - COMPARISON BETWEEN PROJECTS A AND B

Foremen Time Allocation Project A (AWP)

- Meetings - Client/Coordination/Scheduling/Look Ahead: 70% - 18% - 5%
- Plan/Prioritize Tasks & Failback Work (Plan "B"): 51% - 42% - 5%
- Safety Related Activities - Meetings/PHA Development/Inspections/Action Items/Sign/Review PLHAs: 12% - 22% - 4%
- Complete Paperwork: 14% - 55% - 26%
- Coordinate with Other Crews/Support: 44% - 55% - 55%
- Supervise/Motivate/Execute: 28% - 46% - 26%
- Plan for Future Work: 35% - 54% - 39%
- Work on Tools with Crew: 50% - 29% - 21%
- Receive/Check/Verify Materials in Area: 15% - 63% - 26%
- Move Crews to Contingency Work: 8% - 48% - 44%

Foremen Time Allocation - Project B (Traditional)

- Meetings - Client/Coordination/Scheduling/Look Ahead: 69% - 17% - 4%
- Plan/Prioritize Tasks & Failback Work (Plan "B"): 48% - 37% - 3%
- Safety Related Activities - Meetings/PHA Development/Inspections/Action Items/Sign/Review PLHAs: 22% - 68% - 4%
- Complete Paperwork: 26% - 48% - 17%
- Coordinate with Other Crews/Support: 14% - 39% - 26%
- Supervise/Motivate/Execute: 23% - 41% - 25%
- Plan for Future Work: 36% - 40% - 15%
- Work on Tools with Crew: 37% - 34% - 17%
- Receive/Check/Verify Materials in Area: 7% - 34% - 26%
- Move Crews to Contingency Work: 8% - 47% - 38%

Preliminary results