CII AWP Community of Practice

• State of E & C Industry
• Data & People
• Outcomes Based Model
• Cooking and AWP Best Practice
• AWP COP Trends and Advancements
• Connectography
• Q&A
"Our house is on fire," Bechtel told the audience. "If we don’t address [the various problems], we may cease to exist as an industry and … customers will cease to have confidence that we can deliver."

- Brendan Bechtel CII Conference Keynote 2016
Alignment Platform Needed
Data Centric Execution

ASSET INFORMATION MANAGEMENT

Data Centric Execution Platform

Corporate or Project System Integration
Doc Control, Procurement, MMS, Scheduling, Estimating, Earned Value

Management of Change

Occasionally Connected

Handover to Owner

Completions Application

Construction Applications

Engineering Applications

Information Mobility
Data Centric Execution

He/She who controls the data on a project is King/Queen!
Success in Advanced Work Packaging

10% Technology, 90% Sociology

Outcomes Based Model
Driving Behavioral Change
AWP Effectiveness

CII RT 319 Validation of AWP

<table>
<thead>
<tr>
<th>Performance Dimension</th>
<th>Maturity Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 – AWP Early Stage</td>
</tr>
<tr>
<td>Productivity</td>
<td>Around 10% improvement</td>
</tr>
<tr>
<td>Cost</td>
<td>Project on budget</td>
</tr>
<tr>
<td>Safety</td>
<td>0 lost-time accident (TRIR below company average)</td>
</tr>
<tr>
<td>Schedule</td>
<td>Project experienced minor delays</td>
</tr>
<tr>
<td>Predictability</td>
<td>Not very satisfying (major changes to estimates)</td>
</tr>
<tr>
<td>Quality</td>
<td>In line with previous quality performance</td>
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</table>

Invest .5- 2% to achieve a 10% reduction in TIC
### Outcomes Based Metrics

**How do we know we are getting better Productivity?**

<table>
<thead>
<tr>
<th>ID</th>
<th>KPI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PRHS</td>
<td>Historical productivity by discipline used for estimating from past performance</td>
</tr>
<tr>
<td>2</td>
<td>PRVR</td>
<td>Historical variations by discipline from planned productivity rate versus actuals</td>
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<tr>
<td>3</td>
<td>PRPL</td>
<td>Planned project productivity by discipline unadjusted for AWP</td>
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<tr>
<td>4</td>
<td>PRAC</td>
<td>Actual productivity by discipline during performance (weekly and cumulative)</td>
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<tr>
<td>5</td>
<td>PRTR</td>
<td>Trending of productivity by discipline</td>
</tr>
<tr>
<td>6</td>
<td>LHTS</td>
<td>Total budgeted labor hours &amp; cost by discipline</td>
</tr>
<tr>
<td>7</td>
<td>LHAVC</td>
<td>Total Actual labor hours &amp; cost by discipline</td>
</tr>
<tr>
<td>8</td>
<td>LHTR</td>
<td>Trending (forecast) of actual labor hours &amp; cost by discipline</td>
</tr>
<tr>
<td>9</td>
<td>LH_CWP</td>
<td>Planned versus actual labor hours &amp; cost CWP</td>
</tr>
<tr>
<td>10</td>
<td>LH_IWP</td>
<td>Planned versus actual labor hours &amp; cost of IWP</td>
</tr>
<tr>
<td>11</td>
<td>LH_CWP/TR</td>
<td>Trending of variance in CWP labor hours &amp; cost by discipline</td>
</tr>
<tr>
<td>12</td>
<td>LH_IWP/TR</td>
<td>Trending of variance in IWP labor hours &amp; cost by discipline</td>
</tr>
</tbody>
</table>

Source: Southern Company Presentation at FIATECH 2016 Conference
Where are we in the journey?

Take the mystery out of it and watch the magic happen!
– Dr. Jorge Venegas
Cooking and AWP Community of Practice

- Ingredients
- Recipes
- Chefs
- Food Trucks
- Restaurants
- Culinary Institutes
- Critics
AWP COP Trends & Advancements

• Data centric and work flow driven supply chain
• Construction Driven Execution = EP alignment to C
• Systems Integration – Interface Mgmt
  • AWP + Track & Trace/MMS + Completions
• Mobility apps field progressing
• Telemetry
• AWP Analytics
• Audits & Measurement
• Academy / Education / Certification
• Program & Success Management
AWP COP Advancements - Academies

CII Registered Educational Provider Program (REPP) for AWP Training
AWP COP Advancements – Union Training
AWP COP Advancements – Completions

Hebron Case Study – E&I / Leak Testing

- Data Centric Approach
- Model Visualization
- Opportunity & Constraint Analysis
- Progressive Inspection - Field Computing Technologies
- Collaboration with Contractor

Scope
- 9 E&I Rooms
- 85,000m cable tray
- 1,100,000m cable
- 18,000 panels / devices
- 45,000 terminations
- 26,000 E&I check sheets
- 9000 instrument loops
- 55 Leak Tests (6,732 spls)
AWP COP Advancements – Field Progress

Progressive Inspection Digitized

- Retrieve Inspection scope onto iPad in 3D model format
- Model makes for easy navigation to relevant part of plant
- Mark up cable tray status on 3D model including punch items

- 5957m of cable tray installation validated in 11 days, 25% more cable tray verified in 1/3 the time
- 4738m of cable tray installation validated in 55 days
- 630% efficiency in capture
- 300% - 500% efficiency in data availability
AWP COP Advancements – Telemetry
Mobility – Field Progressing

The KPI.Build™ Suite of Efficiency Enhancing Applications

Mobile Construction Applications
Supporting Dynamic Work Design

Supports Rigor in Decision-Making
Checklists with Approval Hierarchy & Exception Reporting

Based on Industry Best Practices
Risk Management / Work Packaging / Etc.

Closes the Feedback Delay Gap
Daily Productivity Feedback

Completely Flexible Configuration
Project Specific Customization

Mobile Construction Application Features
- Progress / Productivity Measurement
- Advanced Work Package Planning
- Integrated Project Risk Assessments
- Earned Value Measurement Systems
- Requests for Information
- Daily Reports for Change Orders
- Fabrication Planning / Status
- Quality Management Modules
Connectography

• According to McKinsey & Company
  – $57B worth of infrastructure investments by 2030

Looks at the infrastructure connections linking the growing mega-cities around the globe, and their consequences for geopolitics, economics, demographics, the environment, and social identity going into the future.

Connectedness
AWP Community
World Peace
If you have the Passion….consider joining the CII AWP COP!