COAA AWP Scalability Project

Breakout Session

Featuring: The COAA AWP Scalability Project Steering Committee
(Lloyd Rankin, Randy Friesen, Jeremy Furzer, Kirk Harris, Ben Swan and Ryan Posnikoff)
• Project Description - Valve Insertion Project
• Project Screening Tool
• Unfamiliar - Low Complexity (Project)
  o Stage 1 – Preliminary Planning and Design
  o Stage 2 – Detailed Engineering
  o Stage 3 – Construction (Project Execution)
• Project Screening Tool
• Familiar – Low Complexity (Program)
  o Stage 1 – Preliminary Planning and Design
  o Stage 2 – Detailed Engineering
  o Stage 3 – Construction (Project Execution)
• Q/A
Valve Insertion Project

Due to changes in regulations in Canada and the US, with respect to water crossings, liquid pipeline operators have to review the location and response time to close Water Crossing Isolation Valves (WCIVs).
Valve Insertion Project

The review concluded that additional WCIVs needed to be installed across North America and affected liquid pipeline operators have committed to multi-year programs to bring their pipeline systems to current regulations.
Valve Insertion Project

Acme Pipeline Company is adding water crossing isolation valves at multiple locations in support of the regulatory change.
Valve Insertion Project

This project will include the installation of a remote main line valve upstream of a river crossing. Project scope will include new electrical distribution to the area, substation, and instrumentation and controls. A planned outage for the tie-in will be scheduled for a maximum of 24 hours. Project capital cost $2.5 million.
# Project Screening Tool

## COAA SCALABLE AWP

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Date</td>
<td>Project Manager</td>
</tr>
<tr>
<td></td>
<td>Construction Manager</td>
</tr>
</tbody>
</table>

## Construction Familiarity & Complexity Screening Tool

<table>
<thead>
<tr>
<th>Level Rank Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Factor</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Familiarity</th>
<th>Question</th>
<th>Process Advantage</th>
<th>Description</th>
<th>Type</th>
<th>Screening General Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Scope of Work familiarity</td>
<td>Overall project or a duplicate of a previously executed project and the scope of work had changed by &gt;50%</td>
<td>TYPE 1</td>
<td>Record key decisions and actions</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Will the development be managed as a project or program?</td>
<td>Project execution efficiency</td>
<td>Managed as a Project</td>
<td>TYPE 1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Are the work packages reusable for the project?</td>
<td>Engineering and Constructive Work Package production efficiency</td>
<td>Customized engineering or &gt;50% engineering and constructive work package recycled from previous projects</td>
<td>TYPE 1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Regulatory and permitting requirements</td>
<td>Corporate Social Responsibility, Regulatory, Regulations</td>
<td>Although capable, the executive team is not experienced in project specific regulatory permitting requirements</td>
<td>TYPE 1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>What type of contract is planned?</td>
<td>Project execution efficiency</td>
<td>Owner or EPC has partnered with select general contractors and judge construction on a highest value basis</td>
<td>TYPE 2</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>How is equipment and materials purchased?</td>
<td>Project procurement efficiency</td>
<td>Owner or EPC purchase equipment and material from an</td>
<td>TYPE 9</td>
</tr>
</tbody>
</table>
First time valve Insertion

- Project is unfamiliar
- Low in Complexity
- Needs to be managed as a project
Preliminary Planning and Design

- Principle 1: Determine the Project Contract Strategy
- Principle 2: Determine the Project Scope
- Principle 3: Determine the Path of Construction
- Principle 4: Determine how to Work Package the Project
Principle 1: Determine the Project Contract Strategy

Unfamiliar - Low Complexity
- Engineering & Procurement
  - Owner/Engineering Firm
- Construction Management
  - Owner
- Construction Execution
  - Local General Contractor
- RFP Process
  - Pre-Approved Contractor (no bid)
- Contract Structure
  - Cost Reimbursable
Principle 2: Determine the Project Scope

**Unfamiliar - Low Complexity**

- Project Charter
  - Simple Elements
- Project Management Plan
  - Simple Description of How to Execute
- Project Requirements
  - Simple Data Collection/Simple Decision Making
- Risk Register
  - Simple Risk Report to identify/track Impacts
- Organizational Structure & Process
  - Simple Organization / RACI Chart and Communication Plan
- Work Breakdown Structure
  - Simple Schedule & Path of Construction based on a stand alone project
Principle 3: Determine the Path of Construction

Unfamiliar - Low Complexity
- Informal Process with Small Number of Stakeholders
Principal 4: Determine how to Work Package the Project

Unfamiliar - Low Complexity

- CWA’s Are Normally Not Required
- EWP’s & PWP’s Not Required. Simple and included in a Single CWP
- Informal Process. CWP’s/IWP’s Developed by General Foreman/Foreman
Detailed Engineering

• Principle 5: Determine the Project Resource Requirements
Principle 5
Determine the resource requirements

Unfamiliar - Low Complexity

5a) Identify and supply the necessary engineering requirements

- Constructability – Owner and Engineering led. Prefer early Contractor engagement
- Client Reviews – limited design reviews
- Engineering Tools / Deliverable Format – Few tools, likely not using 3D model
- Material Requirement – Limited electronic integration
- Work Packages – Multiple discipline CWP, EWP combined with CWP
- Start-up, Turnover and Commissioning Requirements – extensive planning not required.
Principle 5
Determine the resource requirements

Unfamiliar - Low Complexity

5b) Identify and supply the necessary material requirements

- Purchasing Plan Update – Minor modifications to Procurement planning in Stage 1. All material to be on site prior to construction
- Procurement Work Packages – Not required.
- Material Sourcing, Logistics, tracking – support material arriving on site before construction
Principle 5
Determine the resource requirements

Unfamiliar - Low Complexity

5c) Identify and supply the necessary equipment requirements
• Construction Equipment Plan – Plan required, all construction equipment to be on site prior to construction.
• Construction Equipment Schedule – not required.

5d) Identify and supply the necessary labor requirements
• Direct Labour – preferred contractor estimate field labour by trade upon receipt of CWP
Construction

- Principle 6: Confirm the Project Resource Requirements are satisfied prior to execution
- Principle 7: Monitor Progress and Manage Construction
Principle 6: Confirm the Project Resource Requirements are satisfied prior to execution

Unfamiliar - Low Complexity

• The contractor will ensure the following are in place and validated during IWP creation:
  • All engineering information – provided by Owner
  • Materials all on site – likely all Owner supplied
  • Equipment plan in place – though low complexity still required for unfamiliarity
Principle 6: Confirm the Project Resource Requirements are satisfied prior to execution

**Unfamiliar - Low Complexity**

The contractor will have the following people in place:

- **PM** ✓ Supporting multiple projects
- **CM** ✓ Supporting multiple projects
- **Craft Supervision** ✓ Project dedicated
- **WorkFace Planner** possible If so, a shared resource among projects or roles
- **Project Controls** ✓ Typically Owner function with reports from Contractor
- **HS&E** ✓ Supporting multiple projects
- **QC** ✓ Supporting multiple projects
Principle 7: Monitor Progress and Manage Construction

Unfamiliar - Low Complexity

• IWP creation to be small in scope and may be:
  • One system
  • Multiple discipline
  • Fully align with ITP/ITR

• IWPs created by superintendent or WFP shared among projects
  • More than 10 IWPs a WFP is recommended
Principle 7: Monitor Progress and Manage Construction

Unfamiliar - Low Complexity

• Significant coordination
  • Contractor will interface directly with Owner’s operators for:
    • Shutdown, isolation, block/bleed, de-energizing verification
    • Commissioning and start-up

• Progress tracking
  • Field updates from Superintendent to Owner’s PMT
### Project Screening Tool

#### COAA Scalable AWP

<table>
<thead>
<tr>
<th>Familiarity</th>
<th>Question</th>
<th>Process Advantage</th>
<th>Description</th>
<th>Type</th>
<th>Screening General Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Select best fit description from Drop Down Box</td>
<td></td>
<td></td>
<td>Record key decisions and actions</td>
</tr>
<tr>
<td>1</td>
<td>Is Scope of Work (SOW) similar to previously executed project?</td>
<td>Scope of Work familiarity</td>
<td>Duplicate project with scope of work similar to previously executed projects and has &lt;20% scope change.</td>
<td>TYPE 2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Will the development be managed as a project or program?</td>
<td>Project execution efficiency</td>
<td>Managed as a Program.</td>
<td>TYPE 2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Are the work packages reusable for the project?</td>
<td>Engineering and Construction Work Package</td>
<td>Standardized design of &gt;100% engineering and construction work packages are recycled from previous projects.</td>
<td>TYPE 2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Regulatory and permitting requirements</td>
<td>Corporate Social Responsibility, Regulatory, Permitting</td>
<td>Executive has successfully completed projects similar regulatory permitting requirements.</td>
<td>TYPE 2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>What type of construction contract is planned?</td>
<td>Project execution efficiency</td>
<td>Owner or SPC has entered into joint venture agreement and assigns construction to a higher value base.</td>
<td>TYPE 2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>How is equipment and materials provided?</td>
<td>Maintenance efficiency</td>
<td>Owner or SPC purchases equipment and materials from an approved vendor.</td>
<td>TYPE 3</td>
<td></td>
</tr>
</tbody>
</table>

#### Construction Familiarity & Complexity Screening Tool

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<tr>
<th>Level Rank Matrix</th>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>Unfamiliar</td>
<td>Familiar</td>
</tr>
<tr>
<td>HIGH</td>
<td>Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>
Repeated valve Insertion

• Project is familiar
• Low in Complexity
• Can be managed as a program
**Preliminary Planning and Design**

- Principle 1: Determine the Project Contract Strategy
- Principle 2: Determine the Project Scope
- Principle 3: Determine the Path of Construction
- Principle 4: Determine how to Work Package the Project
Stage 1: Preliminary Planning & Design

Principles 1 - 2 “Deltas”

• **Familiar - Low Complexity**

• **Principle 1: Determine the Project Contract Strategy**
  - Mixed Cost Reimbursable & Lump Sup Instead of just Cost Reimbursable

• **Principle 2: Determine the Project Scope**
  - Project Charter
    - Gives authority to more than one project Manager
  - Project Management Plan
    - Includes how the program is coordinated
  - Work Breakdown Structure
    - Standardized across all projects
Stage 1: Preliminary Planning & Design

Principles 3 - 4 “Deltas”

Familiar - Low Complexity

- Principle 3: Determine the Path of Construction
  - Again, Informal Process with a Limited Number of Stakeholders
  - Reuse POC Developed for previous Projects with Validation and Minor Modifications

- Principle 4: Determine how to Work Package the Project
  - Simplified CWP’s/IWP’s Are Reused From Previous Projects With Minor Modifications
Detailed Engineering

- Principle 5: Determine the Project Resource Requirements
Stage 2: Detailed Engineering
Principle 5 “Deltas”

Familiar - Low Complexity

a) Identify and supply the necessary information/engineering requirements
   • Engineering Tools / Deliverable Format – Templated for the program.
   • Work Packages – Templated for the program.

b) Identify and supply the necessary materials

c) construction equipment requirements
   • Construction Equipment Plan – Reuse Construction Equipment Plan for program.

d) Identify and supply the necessary construction execution labor requirements
   • Direct Labour – Baseline comparison to program – reanalysis where scope justifies.
• Principle 6: Confirm the Project Resource Requirements are satisfied prior to execution
• Principle 7: Monitor Progress and Manage Construction
Stage 3: Construction
Principles 6 - 7 “Deltas”

Familiar - Low Complexity

• Principle 6: Confirm the Project Resource Requirements are satisfied prior to execution
  • The contractor will still ensure all engineering, material & equipment are in place and validated during IWP Creation

• Principle 7: Monitor Progress and Manage construction
  • IWP’s remain small in number and scope
  • IWP’s are reused, validated and shared across multiple projects where possible
  • Significant coordination with Owner across multiple projects
  • Progress Tracking across multiple projects
Q & A

Question and Answer Period
Thank You!