CUTTING THROUGH THE BULL: PART ONE

Brian Vogel (Dow) Heath Luis & Silvana Lara (Fluor)
Presenters

Brian Vogel
Global AWP Champion

Heath Luis
Global Construction Services Director

Silvana Lara
Global AWP Director
Dow Corporate Overview

- Recently completed merger with DuPont. DowDuPont is a holding company. Will split into three independent, publicly traded companies.
- Delivers integrated solutions for agriculture, material science, and specialty products sectors.
- 7,000 product families manufactured at 189 sites in 34 countries
- #62 on the 2017 FORTUNE® 500 list with revenue of $48 Billion in 2016
- 56,000 employees globally
- 120-year Dow legacy
- hDow - Owner/Operator with internal capability for EPCm to execute capital projects for facilities on six continents.
EPC Selection

Considerations when Selecting an Engineering Contractor

AWP is fully integrated into the Dow Global Work Processes

Level of AWP engagement at the EPC company

Determine compatibility with EPC company WP’s
EPC Selection

Considerations when Selecting an Engineering Contractor

- The Owner should specify the deliverables from the EPC, but allow/encourage the EPC to use its own work processes and tools.

- Alignment and Integration of EPC work processes to Dow’s Global Project Methodology
EPC Selection

Considerations when Selecting an Engineering Contractor

• Language in purchase orders requiring suppliers to furnish data that will be used to plan and manage construction activities
  • Data from suppliers feed Construction Integration Tool

• Trust, but verify
  • The Owner should perform spot checks/audits to ensure compliance to owner requirements, and that deliverables are sufficient to support the AWP effort
Fluor Corporate Overview

• One of the world’s largest publicly traded engineering, procurement, fabrication, construction and maintenance companies

• **Designs, builds and maintains** capital-efficient facilities for clients on six continents

• Delivers **integrated solutions** for clients in the energy & chemicals, government, life sciences & advanced manufacturing, infrastructure, mining & metals and power market sectors

• Serving more than 4,000 clients in over 100 countries

• #149 on the 2017 **FORTUNE® 500** list with revenue of $19 billion in 2016

• More than 60,000 employees executing projects globally

• 105-year Fluor legacy
EPC Selection

Considerations when Selecting an Engineering Contractor

• Processes and procedures 000.501.1000
• Capabilities and experiences
• Contract and procurement language
• Comprehensive lifecycle services for client capital assets
  - FEED
  - Detail Engineering
  - Construction
  - Turnover & Commissioning
Considerations when Selecting an Engineering Contractor

- Integration and alignment, AWP Work Processes definition and the correspondent interfaces:
  - Engineering
  - Project Control
  - Material
  - Construction
  - Quality
  - Turnover
EPC Selection

Considerations when Selecting an Engineering Contractor

• Data integration
EPC Selection

Considerations when Selecting an Engineering Contractor

• Training programs
• Audit resources
• Corporate support
EPC Selection

Begin with the end in mind.

- Less manhour exposure, better HSE statistics
- Clear SOW definition
- Early path of construction definition
- Smooth integration between the project phases specially to execution
- Measureable results
- Greater schedule and cost certainty
- Easier Project Management
CUTTING THROUGH THE BULL: PART TWO

Jamie Gerbrecht (ExxonMobil) and Michael Van Swol (Jacobs)
How do you choose the right partner?
Current Industry Context ...
and Opportunity
Global Infrastructure Spend Is on the Rise

Global infrastructure investment by industry¹

$13 trillion

109% increase

¹ McKinsey & Company. Selected years, constant 2005 prices and exchange rates, $ trillion. Forecast assumes price of capital goods increase at same rate as other goods and assumes no change in inventory.

© JACOBS 2017
98% of Megaprojects Overrun

- 77% of megaprojects ≥ 40% late
- 98% of megaprojects ≥ 30% over budget
- 80% average overspend
Productivity is “the measure of the rate at which work is performed. It is a ratio of production output to what is required to produce it. The measure of productivity is defined as a total output per one unit of a total input.”
What Is the Cause of the Overruns?

**Manufacturing**

- $ thousand per worker

**Construction**

- Productivity gap

- Out of sequence execution
- Engineering/procurement delays
- Material/equipment planning
- Low technology adoption

$ thousand output per worker
Opportunity to leverage new technologies

- Increase facility up time
- Improve productivity
- Increase plant availability

- Improve Total Recorded Incident Rate
- Increase tracking & notification systems
- Reduce operating costs
How Does J-AWP Deliver Results?

- Subdivide into mini EPC projects
- Align CWAs to unit operations
- Plan activity durations based on project requirements
- Mitigate delays with schedule buffers
- Strengthen supply chain at all stages
Optimizing New Technologies

New technologies to transform project delivery

- Siloed execution
- Collaborative platforms
- Paper-based processes
- Accessible data
Optimizing New Technologies

3D Design Model
- Equipment tag #
- Physical properties

Purchasing and Materials Management
- Purchase order
- Expediting
- Logistics

Field Labour Analysis
- Estimated labor
- Installation status
- Productivity

Object-centric integration

Procurement
- Engineering
- Construction

Single source of accessible asset information across the project execution lifecycle

Constantly changing and up-to-date throughout process

Fully integrated with J-AWP Approach

Accelerate project delivery with integrated information

Fragmented information drives up cost and delays
Transform Information Handover

Endeavour collaboration and publishing

Consolidated, trusted data

Facilitating information management and digital asset analysis

Endeavour (Aveva net)

Client Systems
- Data Warehouse
- Operational Systems
- Business/security applications
- Document Management

JPI

JPI (data and document management system)

Owner

Aveva net

Facilitating information management and digital asset analysis

Operational Systems

Business/security applications

Document Management

Warehouse
How do you choose the right partner?
## Key Considerations

<table>
<thead>
<tr>
<th>Culture/People</th>
<th>Current limitation</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate commitment to AWP</td>
<td>Consistent application of principles</td>
<td></td>
</tr>
<tr>
<td>Experienced personnel</td>
<td>Not reinventing on every project</td>
<td></td>
</tr>
<tr>
<td>Culture of learning</td>
<td>Continuously improving</td>
<td></td>
</tr>
<tr>
<td>Structured education and development</td>
<td>Capability and Depth</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Processes</th>
<th>Current limitation</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documented work processes</td>
<td>Improved Contractor/Client alignment</td>
<td></td>
</tr>
<tr>
<td>Fit for Purpose</td>
<td>Applicable to all projects</td>
<td></td>
</tr>
<tr>
<td>Multiple Execution Approach</td>
<td>Value creation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology</th>
<th>Current limitation</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leverage Information for decision making</td>
<td>Efficient execution</td>
<td></td>
</tr>
<tr>
<td>Platform Integration</td>
<td>Investment in integration</td>
<td></td>
</tr>
<tr>
<td>Timely and accurate</td>
<td>Current and effective planning</td>
<td></td>
</tr>
</tbody>
</table>
Transforming Project Delivery Through Technology

Investing and creating value

Becoming better partners with clients

At the forefront of the industry

Developing partnerships with the technology industry

Positioned for the future

Michael Van Swol
Vice President, Project Delivery
Michael.VanSwol@jacobs.com
Contractor Selection – ExxonMobil

- Case for action and Management commitment/support
- AWP experience / maturity / knowledge / training – publications, courses, conferences
- AWP Plan / organization / staffing – Champions, Leads, Workface Planners, etc.
- Information management – automation / visualization tools integration and data flow
- Subcontractors / suppliers engagement
Contractor Selection – ExxonMobil

- Work Processes – interactive planning / path-of-construction / work areas and packaging
- Constraints management – drawings, materials, equipment, permits, access, etc.
- Controls / tracking / reporting
- Feedback loop, assessments, and ongoing improvement
- Contractual support
CUTTING THROUGH THE BULL
Panel Discussion and Audience Question-and-Answer Period