Digitally Transforming Energy Infrastructure Projects

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Chris Cran – AVEVA
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BUILDING ENERGY’S FUTURE

ONSHORE  OFFSHORE  SUBSEA & FLOATING FACILITIES  STORAGE
**Industry Metrics**

Data from KPMG: *Familiar challenges – new approaches, 2023 Global Construction Survey*

In last 12 months, 37% of Projects significantly missed budget and/or schedule performance

<table>
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<th>Exhibit 5: Over the past 12 months, have any of your capital projects significantly missed budget and/or schedule performance targets (20 percent or more) due to lack of effective risk management?</th>
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<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Engineering/construction firm</td>
</tr>
<tr>
<td>Project or infrastructure owner organization</td>
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**Exhibit 8: Please rate the following attributes that influence your organization’s success or failure in dealing with disruptive events.**

- **Industry focus:** 72% [4-5 More important], 19% [3 Neutral], 8% [1-2 Less important]
- **Maturity of business continuity programs:** 71% [4-5 More important], 20% [3 Neutral], 9% [1-2 Less important]
- **Regions of operations:** 57% [4-5 More important], 20% [3 Neutral], 13% [1-2 Less important]
- **Site and project personnel:** 60% [4-5 More important], 36% [3 Neutral], 4% [1-2 Less important]
- **Focus on innovation:** 24% [4-5 More important], 22% [3 Neutral], 4% [1-2 Less important]
- **Adoption of technology:** 78% [4-5 More important], 18% [3 Neutral], 4% [1-2 Less important]
- **Workplace demographics:** 49% [4-5 More important], 36% [3 Neutral], 15% [1-2 Less important]
- **Company leadership:** 94% [4-5 More important], 4% [3 Neutral], 1% [1-2 Less important]
- **Ownership (public or private):** 54% [4-5 More important], 29% [3 Neutral], 17% [1-2 Less important]
- **Effective risk management processes and resilience planning:** 84% [4-5 More important], 14% [3 Neutral], 2% [1-2 Less important]

Innovation & Adoption of technology viewed as significant factors influencing organization’s success dealing with disruptive events.
Challenges & Solution?

Complexity + Resource Constraints + Supply Chain Pressure + Schedule & Cost Pressure = Success?

**Processes**
- **Need...** Maximize quality and minimize effort
- **Tools Must...** Enable process transformation
- **How?** Reimagine for current capabilities
  - Leverage APIs, not spreadsheets
  - De-siloed + Visualization = Information

**Integrations**
- **Need...** Ensure integrity and break down silos
- **Tools Must...** Minimize deployment time & effort to execute
- **How?**

**Data or Information**
- **Need...** Contextualization & Timeliness
- **Tools Must...** Standardize... but extend
- **How?**
Document Driven Execution

4.0 DESIGN

4.1 General Requirements

4.1.1 VENDOR shall take full responsibility for the skid and equipment design fully complying to the applicable standards, rules and regulations for the project.

4.1.2 The overall dimensions of the skid shall not be less than the overall dimensions of the skid-mounted equipment.

4.1.3 Where appropriate, modules shall be identified by suitable markings designated by the CONTRACTOR.

4.1.4 All ladders and access platforms shall be seal welded and shall be in accordance with OSHA recommendations or the ABS Guidance Notes for the Application of Ergonomics to Marine Systems, Section 9, whichever is more stringent.

4.1.5 All skids shall be designed for seal welding to a structural steel deck using the formation of pockets which can trap water. Skid-mounted equipment liquids which may be spilled or drained into the skid area shall be protected from the deck and coaming on the perimeter of the skid to contain spillage. Coaming areas shall be provided with a minimum of two drains, terminating with forged, 30004 screwed coupling with a hex plug.

4.1.6 All skid-mounted equipment, vessels, buildings and related assemblies shall be designed and mounted to withstand the wind loading, seismic conditions, and vessel motions given in Specification B5729-S-SP000-TS-2002-00.

4.1.7 Skids shall be sandblasted and painted as per Specification B5729-M-SP000-TS-500-00.

4.1.8 Skids with driven equipment shall be designed to maintain equipment alignment while being lifted.

4.1.9 The skid shall be all welded construction designed and carried out in accordance with the specification of the American Welding Society, Structural Welding Code AWS D1.1/D1.1M, latest edition, and Specifications B5729-S-SP000-TS-2002-00 and B5729-Q-PP509-TS-0556-00. All welds shall be continuous welds and all welded attachments must be seal welded.
Project Architecture (getting closer to Utopia)

Class Library

Contract Documents & Requirements

Requirements Management Tool w/ Digital Documents

EDMS Tool

Change, Hold, & Action Management Tool(s)

Multi-Functional Tools

Integrated Engineering Tools

1D

2D

3D

SCM / Fab / Construct / Commissioning Tools

Dashboards & Visualizations

Cost & Schedule
DATA IS IN OUR DNA
Lighthouse Scope

ALM Primary use cases

- Engineering system of record for the Digital Twin

Core Capabilities

- Deliverable Management (Unified Engineering Integration)
- Engineering Change & Workflow Management
- Requirements Management
- Configuration Management
Lighthouse Programme

Contributing to Agile Sprint Reviews

Contributing questions and advice at System Demos

Sharing and demoing current working practices

Participating in workshop sessions on solution design

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Why Aras?

“A leader in PLM” - The Forrester Wave, Q1 2023

23+ Years in PLM

500+ Customers

4M+ Users

Adaptable
Highly extensible with composable building blocks and integrated low-code development tools

Scalable
Performance at the scale that you work at

Open
Connectivity across your enterprise software ecosystem
Why Asset Lifecycle Management?

**Owner Operators**
“A data centric approach to managing Asset Information to deliver trusted asset data”

**Highly Regulated Industries**
“A digital twin to manage requirements, configuration, and change management; through the entire lifecycle”

**EPC Capital Projects**
“An integrated Digital Platform For efficient project delivery, modular design & re-use and improved supply chain collaboration”

**Marine**
“Traceability between requirements, CAD, equipment, BOM, sourcing, cost management, planning, and sister ship configuration”
Bring PLM concepts to the Asset Lifecycle

Focus on the capabilities important to you

- Data-centric Deliverables
- Change Management
- Requirements Management
- Configuration Management
- Supplier Exchange
- Workflow
- BoM Management
- Analytics & Tracking
And place them in a data-centric context

- Change Management
- Configuration Management
- Analytics & Tracking
- BoM Management
- Supplier Exchange
- Workflow
- Requirements Management
In defence of documents

And why we need them

Human-readable

Portable

Flexible
The data-centric approach to Lifecycle Management

And the value it adds

Automated Validation
Integration
Analysis
“The integration of these two toolsets presents a strong digital-centric execution solution... to digitalize industry processes that have been document-centric for too long”

Vaseem Khan, SVP Global Operations, McDermott
From Data to Knowledge: Empower your lifecycle using a Digital Thread

The AVEVA/Aras Partnership brings you Asset Lifecycle Management

Malcolm Panthaki | VP of Global Alliances | Aras
The Aras Corp Commitment

**PURPOSE**
Enable our customers to create safe and innovative products that play an essential role in our lives.

**VISION**
Transform the way the world makes products.

**MISSION**
Reinvent software for engineering and manufacturing to empower our customers with the flexibility to overcome tomorrow’s challenges.
Why Aras for Asset Lifecycle Management?
“A leader in PLM” - The Forrester Wave, Q1 2023

- Adaptable
- Scalable
- Open

Why Aras for Asset Lifecycle Management?

- Years in PLM: 23+
- Users: 500+

Adaptable, Scalable, Open

BUSINESS REQUIREMENTS (Customized for ALM)

APPLICATION
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PLATFORM SERVICES
INDUSTRIAL LOW-CODE MODELING ENGINE
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Benefit from a Full Lifecycle Digital Thread

Required Functional Logical As Designed Digital Thread Planned As Built As Delivered As Serviced

Define Design Construct Operate
Joint Value Proposition Example: Deliverables Management Workflow

**Efficient Process and Plant Design – Compliance – CAPEX Optimization**

**Data Aggregation Platform**
- AIM and AVEVA CVS

**Any Users**
- View | Decide | Share

**Requirements Engineer / Program Manager**
- Analyze | Investigate | Validate

**Process and Plant Design**
- Design | Modify

**AVEVA E3D publishes deliverables to ALM**

**AVEVA Engineering publishes deliverables to ALM**

**Asset Lifecycle Management (ALM)**
- Deliverables registered, versioned & baselined

**Comments on Deliverables are addressed in UE**

**Approval workflows executed and deliverables baselined & attached to configuration / requirements**

**Deliverables made available for visualisation via data hub**

**Community Applications**

**Customer Applications**

**Efficient and Sustainable Operations**

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Questions?

Please speak to us after the session is over or visit us in our booths:
- Aras Partner Booth
- AVEVA Digital Twin Booth

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Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life’s essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world’s most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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