Case Study
Automating the “S” Curve

Integrated Project Information Management and Monitoring System

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Agenda

› Safety Moment
› Project S Curve – EVM Challenges
› Project Background
› Project S Curve – Meeting The Challenge
› Implementation Plan
› Roll Out and Execution
› Benefits Obtained
› Lessons Learned

Safety Moment

News headline: An unfinished overpass collapsed in the Brazilian World Cup host city of Belo Horizonte on Thursday, leaving at least one person dead and casting a shadow over a tournament that has suffered repeated construction accidents and delays.

“It’s a moment of tremendous emotion and tremendous sadness,” said the Secretary of Public Works and Infrastructure of Belo Horizonte’s city government, Jose Lauro Nogueira, in a heated press conference on Friday.

“We have undertaken very detailed and thorough tests of all of our construction and none of them showed up any problems. We work with excellent companies with fine reputations and experience. Now we will take the necessary measures to establish what happened here.

“We are going to work with specialists in the area to determine what went wrong and establish the cause and the responsibility for yesterday’s tragedy.

Safety Moment

› As-built Drawings
  • Owner Operators run the risk of using an as-built documentation set that is inaccurate.
  • This presents a safety risk to maintenance, operations and contractors working on site.
  • Typical Causes
    ✓ Lackluster efforts on the part of contractors and the many subcontractors/fabricators responsible for them
    ✓ The contractor’s perception of not being paid for providing as-buils
    ✓ Coordination problems due to the many subcontractors and specialty fabricators necessary to document changes
    ✓ Differences in what the owner’s representatives expect versus what the contractor delivers.
Project S Curve – EVM Challenges

- Project stakeholders spread across multiple organizations and locations.
  - Supply
  - Procurement
  - Regulatory
  - Construction
  - Engineering
  - Shop Fabrication

- Multiple IT systems without business level integration.
  - Operations
  - (Information access difficulties)

- Capturing progress from stakeholders difficult and update of progress is laborious.
  - Primavera
  - ERP
  - Records
  - Business Process

Case Study– Project Background

EPC Project Details
- Project Name: Ahdab Oil Field
- Project Type: Oil and Gas
- Asset Owner: Iraq
- Location: Middle East Iraq
- Production: 140 BPD
- Operator: CPECC
- Contractor: CH2M Hill
- Project TIC: $1.6 billion, USD
- Project Schedule: 36 Months
- Project Completion: 2011
- Execution Requirements
  - Progress Measurement: Earned Value
  - Management: Multi-Location Offices
  - Engineering: 120 Plus Vendors
  - Supply Chain: Oracle, P6

Case Study– Meeting The Challenge

Automating an S-curve means automating each of its component processes.

∑

The whole is greater than the sum of the parts.

Case Study– Project Background

CPECC submitted a bid that was higher-cost but faster-to-market 25 months.

CPECC and CH2M Hill combine forces to execute project. CH2M Hill committed to complete 50,000 engineering deliverables in 9 months.

CH2M Hill develops work-share plan for 400,000 project deliverables in Abu Dhabi, Madrid and India offices to make the deadline.

Iraqi government agreed but added stringent late delivery penalty plus on-time completion bonus.

Iraqi government opened bidding for development of Ahdab oil field. (Most vendors backed out due to the fast-track schedule of 36 months).

In July 2011 the Ahdab Oil Field produced its first oil barrels, exactly on schedule.

CH2M Hill proposes as an “Ace-In-Hole” technology system WRENCH for engineering management that enabled much faster results.

Start
Case Study – Meeting The Challenge

Project Management Information System Goals

- Predictability
  - Real time Earned Value based progress monitoring.
- Visibility
  - Integration with disconnected project execution systems.
  - Portfolio and Project Dashboards
- Efficiency
  - Global Collaboration across project stakeholders.
  - Work Flow Management.
  - Task Management.
- Consistency
  - Integration with Company Quality Management System.

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Case Study – Meeting The Challenge
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**Multi-location collaboration**

A - Central storage

- Central Server
- Site server
- Other users
- Design Sub-Contractor
- JV Parties

**The Solution:** Hybrid of central data storage and common connection & administration

**Information Reports and Dashboards**

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**Case Study – Roll Out and Execution**

- Requirement gathering on Vendor management and Correspondence management – Completed by April 12th 2011
- WRENCH extended to New Delhi and Madrid office – Completed by April 24th 2011
- Requirement gathering on operations – Completed by March 16th 2011
- WRENCH configuration as per the Phase I requirements – March 25th 2011
- Training of Project team on WRENCH to support Phase Rollouts

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- WRENCH Teams at CH2M Hill Office – Feb 22nd 2011
- WRENCH Configuration to be per Phase I requirements – March 25th 2011
- Phase II Go Live – April 24th 2011

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- Requirement gathering on Vendor
- Operations and other reporting requirements – Completed by march 16th 2011
- Requirement gathering on operations – Completed by March 25th 2011
Case Study– Results

CNPC Completes First Phase of Al-Ahdab Field

Posted on 27 June 2011. Tags: al-Ahdab, China National Petroleum Corp, China National Petroleum Company, CNPC, PetroChina

Reuters reports that the China National Petroleum Corp (CNPC), the first foreign oil company to sign an oil service contract in Iraq after former president Saddam Hussein was toppled, said on Monday said that it completed construction of the first phase of the Al-Ahdab oilfield.

The parent of PetroChina Co Ltd said it started work on the Al-Ahdab oilfield in March 2009 after successfully renegotiating an old development deal, and hoped to pump 110,000-130,000 barrels per day (bpd) from the field, which had estimated reserves of 1 billion barrels.

Completion of the first phase, with a capacity of 60,000 bpd, was ahead of schedule, marking major progress in building Middle East oil and gas projects, reported the China Petroleum Daily, CNPC’s in-house newspaper.

The field was the first new oil capacity building project in 20 years in Iraq, the report said.

(Source: Reuters)

Case Study– Questions and Answers

Case Study– Results Qualitative

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<th>ITEM</th>
<th>BENEFITS</th>
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<tr>
<td>1</td>
<td>Actual status collecting and reporting</td>
<td>70% reduction in overall time taken to collect data and generate reports</td>
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<td>Accuracy of reporting</td>
<td>Real time reports drastically improved the accuracy as they provided the current status and set standards for the planning</td>
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<td>Efficient re-forecasting</td>
<td>With real time data, Project controls were able to provide schedule analysis and reforecast the plan for engineering to expedite and recover delays</td>
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Case Study– Results Quantitative

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<tr>
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<td>NUMBER OR %AGE</td>
<td>BEFORE</td>
</tr>
<tr>
<td>1</td>
<td>No. of PM staffing personnel required to direct project</td>
<td>8 FTEs</td>
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<tr>
<td>2</td>
<td>No. of tasks/activities/deliverables on the project</td>
<td>30,000</td>
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<td>3</td>
<td>Time taken for getting planned vs actual progress data of package-wise engineering status from various EPC contractors &amp; sites</td>
<td>8 hrs.</td>
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<tr>
<td>4</td>
<td>Time taken to check &amp; organize received data</td>
<td>2-3 hrs.</td>
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Case Study– Questions and Answers