WFP Fundamentals: The Build

Simulation Details

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<th>Description</th>
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<td>Rev. A</td>
<td>Simulation updated and document imported to 2013 template</td>
<td>01 JAN 13</td>
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Record of Revision

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<td>Lloyd Rankin</td>
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<td>Lloyd Rankin, Steve Manktelow</td>
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1. **Background**

ASOC (Ascension/ SAIT Oil Company) is a joint venture of Ascension Oil Company and SAIT Oil company, two established Canadian conventional oil companies. While both firms have experience developing conventional plays (upstream and downstream), this is their first heavy oil development project and the budget is several orders of magnitude larger than what they are accustomed to. Investor money was required to put the deal together and the project - UFI (Upgrader Facility 1) - is a greenfield project with a three-year construction schedule, a $10 billion budget and a target annual production of 65 million barrels.

2. **Contracting Strategy**

There are 16 primary construction contractors, multiple subcontractors and four engineering firms. Most companies are working on a cost-reimbursable basis, but some smaller, discrete pieces of work are being constructed on a lump-sum basis. The construction management function is being performed in some cases by the engineering, procurement & construction (EPC) company, and in some cases by a construction manager hired by the owner.

3. **Complexity**

The complexity of the project is the result of multiple stakeholders working a variety of shifts and using multiple rules of credit, multiple progressing systems, multiple coding systems (many stakeholders have different designators for the same parts, tools, and equipment) and multiple inventory management systems.

4. **Construction Management**

The engineering companies and construction firms are not configured as an EPC and the owner has hired a construction manager to manage the project: TFI Construction Management (CM), Inc. (the course instructor).
5. Project Controls

The construction manager has identified internal requirements for the contractors to do their own project controls. They are also required to report progress based on the CM project controls group’s requirements. Project control requirements will be provided by the construction manager’s project controls group.

6. Engineering

The engineering for the pipe rack (CWP 200) is being completed by Fluor Engineering, a well-established industrial engineering company. The CWP 200 pipe rack will tie in to CWP 300, which is being developed by Convex Engineering.

Scope changes and additions have delayed the completion of engineering and procurement of materials. These scope changes were initiated by ASOC.

7. Materials Management

To reduce costs, ASOC has decided to store all materials in their warehousing facility and release those materials only when the CWP (Construction Work Package) is 100% complete. The 100% release rule is not expected to be a problem because when the execution plan was developed, all materials were expected to be purchased or fabricated prior to the start of construction.

Delays in engineering have resulted in delays in procuring purchased and fabricated materials. Note: contractors will only be able to access materials attached to the CWP that they have been assigned.

8. Fabrication

To reduce costs, fabrication is being done on a unit-cost basis for steel. Pipe spools are being fabricated off-site in Edmonton and transported to site installation. Pilings are being fabricated off-site by the contractor.
9. **Equipment, Scaffolding and Specialty Tools**

To reduce costs, ASOC has decided to store all equipment, scaffolding materials and specialty tools in a variety of locations around the worksite and release those items to the contractors upon written request. Note: contractors will only be able to access items attached to the CWP that they have been assigned. The locations have been identified based on the CWP developed by the engineering firms. These were based on the level-3 schedule and were determined prior to contractor selection. For detailed equipment, scaffolding and specialty tools, please see the resource handout.

10. **Claims**

Even though this is a cost-reimbursable contract, in cases where the CM recommends that some costs not be reimbursed, the contractor may opt to make a claim (e.g., training costs).

11. **Permitting and Safety**

Prior to gaining access to the site, the contractor and other parties will be required to complete a safety orientation and wear all designated Personal Protective Equipment (PPE). Permitting is required for all heavy lift and excavation activities prior to work commencing. Areas where permitting is required must follow detailed permitting instructions.

12. **Laydown Areas**

All laydown areas have been identified based on the CWP developed by the engineering firms. These were based on the level-3 schedule and were determined prior to contractor selection.

13. **Scope of Work**

The classroom construction is at 1/10 scale and this is part of a much larger pipe rack that continues through much of the project.
14. Construction

14.1 Civil

National Earthworks has been sub-contracted to complete the civil portion of the contract. They are a very experienced and capable contractor. To reduce equipment costs, all perimeter pilings (as shown in the CWP) will be installed using the short-boom crane, prior to installing the central pilings using the long-boom crane. In the execution plan, the civil work was planned to be complete prior to structural or piping starting, so this condition should not negatively impact the construction activities.

Delays in engineering have resulted in delays in procuring purchased and fabricated materials.

14.2 Structural Steel

The steel work has been sub-contracted with the fabrication of steel and is being done by ASI Steel. The erection is being done by Steel Structures, an experienced and very capable contractor. According to the execution plan, the steel should be fabricated and delivered to ASOC for warehousing prior to the start of steel erection.

Delays in engineering have resulted in delays in procuring purchased and fabricated materials.

14.3 Piping

Piping fabrication and erection is being done by the prime contractor Depot, an experienced and very capable contractor. According to the execution plan, spool fabrication should be completed and delivered to ASOC for warehousing prior to the start of pipe erection.

Delays in engineering have resulted in delays in procuring purchased and fabricated materials.

15. Quality Assurance/Quality Control (QA/QC)

QA/QC will ensure that construction adheres to all site safety standards and is constructed as indicated in the most recent version of the CWP.
16. **Hydrotesting**

Each line needs to be checked and tagged as complete to support hydrotesting. Note: the actual hydrotesting will be performed by another contractor.
APPENDIX A: PIPERACK VIEWS

See following page(s)
APPENDIX B: PILING DRAWING

See following page(s)
APPENDIX C: PLOT PLAN

See following page(s)
APPENDIX D: STEEL DRAWINGS

See following page(s)
APPENDIX E: ISOMETRIC DRAWINGS

See following page(s)
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**PIECE MARKS**

- H-2801-B-1
- H-2801-B-2
- H-2801-B-3

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**FLUOR.**

**WORKFACE PLANNING FUNDAMENTALS**

**ISOMETRIC DRAWING**

**DATE:** 25-JAN-2008

**PROJECT:** PIPERACK STRUCTURES

**LINE NUMBER:** CWS-2001-AAA-1-14"
FLUOR.

WORKFACE PLANNING ISOMETRIC DRAWING
FUNDAMENTALS CNST 244

DATE 25-JAN-2008
PROJECT PIPERACK STRUCTURES
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SK:* REV. 1 of 1

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## APPENDIX F: PLASTIC PIPE NUMBERING SYSTEM

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