WORKFACE PLANNING
CONFERENCE-WIDE SESSION
FROM CONCEPT TO COMMISSIONING
INTRODUCTION

- From Concept to Commissioning: what does it mean?
- Who is on the panel?
  - **Ron Embury** | Engineering Team Leader, NOVA Chemicals (Owner)
  - **Ken Kohlruss** | Vice President Operations, Commonwealth Construction [CH2M Hill] (CMT)
  - **Jose Herrero** | Vice President, Fluor (Engineering Contractor)
  - **Tannis Liviniuk** | Lead Construction Analyst, Cenovus Energy (Construction Contractor)
  - **Lloyd Rankin** | Researcher, COAA (Facilitator)
INTRODUCTION
Defines the basic design parameters for the intended project. Generation, review, and approval of the DBM is a prerequisite for the development of the Engineering Design Specification (EDS).
1) Develop WFP execution strategy
2) Assign WFP sponsors and champions
3) Define WFP as required for all participants
4) Project Milestone Schedule (PMS) (level 1)
5) Develop WFP execution plan
6) High-level project review with construction input
7) Design a server to host the databases used by all participants
8) Demonstrate capacity to support WFP
9) Write WFP requirements in contracts
10) Design Area Definition
11) Path of Construction
12) Demonstrate capacity to apply WFP
At the DBM phase, we have three documents that set the stage for WorkFace Planning:

- Project Execution Plan
- Construction Execution Plan
- Constructability Implementation Plan
DBM: OWNER

Project Execution Plan (PEP):

- Overall Project Milestone Schedule
- Project Strategy:
  - The project will be Construction-driven
  - Engineering and Procurement will sequence their work to meet Construction needs.
  - There will be extensive constructability input into the design and Engineering Work Package (EWP)
  - WorkFace Planning will be part of the Construction Execution Plan
  - No work packages (FIWPs) will start without all engineering, materials, tools, equipment and labour present on site.
  - Owner’s commissioning sequence will be by operating systems and will be introduced in the engineering and construction schedules.
Construction Execution Plan (CEP):

- With respect to WorkFace Planning, the construction execution plan will:
  - Set out the Construction Management Organization.
  - Describe the Contracting Strategy
  - Contain the WorkFace Planning Execution Plan
    - Workface Planning Approach
    - Workface Planning Overview
    - Workface Planning Implementation
    - Workface Planning Training
    - Workface Audit Process
  - Progress Reporting
Constructability Implementation Plan (CIP)

- CIP is developed and started in the DBM phase. CIP is used to support WFP concepts.
  - Led by Construction
  - Sponsor(s) identified, Policy Statements described and Constructability Manager is appointed.
  - Sets out focus groups between engineering disciplines, Procurement, Owner, etc.
  - High-level construction sequence is developed.
  - Details of schedule integration is developed between parties.
    - i.e., Engineering drawing sequence developed to support FIWP Schedule
    - i.e., Procurement deliverables developed to support FIWP Schedule.
  - Various other activities are completed to promote ease of construction (design, layout, modular design, pre-fabrication, construction methods, weather, etc.)
DBM: OWNER

Contract types:
- C
- CM
- EP
- EPC
- EPCM
1.0 Definition
2.0 Purpose
3.0 Scope
4.0 Strategies
5.0 Participants
6.0 Roles and Responsibilities
7.0 Method
8.0 Systems
9.0 FIWP’S Release Process
10. Auditing
DBM: CONSTRUCTION MANAGEMENT TEAM

High-level project review which leads to Path of Construction
Path of Construction
DBM: CONSTRUCTION MANAGEMENT TEAM

WFP Automation
Bring your data together in one location

- 3D CAD
- Pipe Isometrics
- Structural Detailing Data
- Line List / Equipment List
- Instrument Index
- Electrical Lists

- L3 Project Schedule
- Rules of Progress
- Unit Rates
- Quantity Tracking (Progress)

- Material Availability
- Material Feasibility
- Offsite Fabricator Status

- Weld Tracking / NDE
- TO Systems/Completions
- Hydro Testing
DBM: CONSTRUCTION MANAGEMENT TEAM
DBM: CONSTRUCTION MANAGEMENT TEAM

- Experienced trainers, educators and assessors (auditors)
- Assessment services
- Self-assessment tools
DBM: ENGINEERING

Sample plot plan (partial)
DBM: ENGINEERING

PROCESSES

PEOPLE

TOOLS

Click to see process

Click to see table of contents
DBM: CONSTRUCTION CONTRACTOR

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10) Design Area Definition
12) Demonstrate capacity to apply WFP
13) Path of Construction
DBM: CONSTRUCTION CONTRACTOR

- Demonstrate high-level capacity to support WorkFace Planning
- WorkFace Planning Awareness for Trades People scheduled for delivery February 2011.
- Pre-beta sample available at this conference
WorkFace Planning Awareness for Trades People:

Fourth, if and when specially-skilled tradespeople are needed on the project, they must be identified early and available when required. Examples include welders, electricians, pipefitters, boilermakers etc., with specialized tickets or training.
WorkFace Planning Course Development Roadmap
EDS defines all elements of project scope and is the control document for commencement of detailed engineering and procurement activities on the project. It is also used in scoping the development of the Authorization for Expenditure (AFE).
11) Ensure all databases are provided with the latest data

15) Project Summary Schedule (PSS) (level 2)

16) Review and Approve PSS

17) Define and Issue CWP Release Plan

20) Define and Issue EWP Release Plan by Design Area

21) Project Master Schedule (PMaS) (level 3)

18) Appoint Lead Planner; Commence WFP Process

17) Define and Issue FIWP Release Plan

14) Review and integrate WFP processes and support functions

* Proactively resolve conflicts between project participants
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Level 2 Schedule

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<th>ID</th>
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<td>001</td>
<td>Piping</td>
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<tr>
<td>002</td>
<td>Establish EWP/WBI Boundaries</td>
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<td>003</td>
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## 511177 - Cooling Water Plate & Frame Exchangers

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<th>WBI Number</th>
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WBI/EWP Structure

- Activity code breaks down discipline code into different activities

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#### Mechanical

#### Construction

| Piping | Prefabricate Ape Spools | 90 | 6 | 90 | 31-May-08 | 17-Sep-08 |
| Piping | Install A/G Pipe        | 132| 6 | 132| 12-Jul-08  | 28-Dec-08 |
| Piping | Pipe Pressure Tests     | 45 | 6 | 45 | 18-Dec-08  | 8-Feb-09  |
| Piping | Reinstatement           | 35 | 6 | 35 | 23-Feb-09  | 4-Apr-09  |
EDS: CONSTRUCTION MANAGEMENT TEAM

11) Ensure all databases are provided with the latest data

15) Project Summary Schedule (PSS) (level 2)

16) Review and Approve PSS

17) Define and Issue CWP Release Plan

18) Appoint Lead Planner; Commence WFP Process

14) Review and integrate WFP processes and support functions

* Proactively resolve conflicts between project participants

20) Define and Issue EWP Release Plan by Design Area

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17) Define and Issue FIWP Release Plan
Proactively resolve conflicts
Review and integrate WFP processes and support functions
Ensure all databases are up to date
EDS: CONSTRUCTION

11) Ensure all databases are provided with the latest data

15) Project Summary Schedule (PSS) (level 2)

16) Review and Approve PSS

17) Define and Issue CWP Release Plan

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20) Define and Issue EWP Release Plan by Design Area

21) Project Master Schedule (PMaS) (level 3)

14) Review and integrate WFP processes and support functions

* Proactively resolve conflicts between project participants
Define and Issue CWP release plan

- Identify the size and description of all CWPs
- Determine when those CWPs will be developed and released
- These can be reported in Excel spreadsheets, Primavera schedules, and other documents
- The EWP schedule will be driven by the CWP schedule
EDS: CONSTRUCTION

Appoint lead planner and commence WFP process
Define and Issue FIWP release plan

- Identify the size and description of all FIWPs
- Determine when those FIWPs will be developed and released
- These can be reported in Excel spreadsheets, Primavera schedules, and other documents
- FIWP development is driven by the CWPs
DETAILED ENGINEERING

22) Engineer develops and releases EWPs

23) Construction develops and releases CWPs

24) Detailed Area Schedule (level 4)

25) Review and approve PMaS

26) Break up CWP into Field Installation Work Packages (FIWP)
DETAILED ENGINEERING: CONSTRUCTION CONTRACTORS

- 22) Engineer develops and releases EWPs
- 23) Construction develops and releases CWPs
- 24) Detailed Area Schedule (level 4)
- 25) Review and approve PMaS
- 26) Break up CWP into Field Installation Work Packages (FIWP)
Construction develops and delivers CWPs
Detailed Level 4 Schedule

- This is a schedule of the release of the Field Installation Work Packages (FIWPs)
- These can be reported in Excel spreadsheets, Primavera schedules, and other documents
Break CWPs into FIWPs
Create FIWPs with simple point and click
DETAILED ENGINEERING: CONSTRUCTION
DETAILED ENGINEERING:
ENGINEERING

22) Engineer develops and releases EWPs

23) Construction develops and releases CWPs

24) Detailed Area Schedule (level 4)

25) Review and approve PMaS

26) Break up CWP into Field Installation Work Packages (FIWP)
# Detailed Engineering: Engineering

## WBI Release Form

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<td>North South Pipe Rack Foundations</td>
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**Date Prepared:** 27-Mar-07  
**Prepared By:** Rupendra Singh

Construction is informed that Engineering is complete in this WBI and the WBI is released for construction with the drawings listed below.

### Engineering Documents

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### Vendor Drawings

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CONSTRUCTION PHASE

31) Review and update Engineering
30) Issue Request for Information
29) Need for extra information?
34) Identify “Work to Go” items
37) Document the lessons learned
36) Approve results and initiate lessons-learned meeting
27) Implement and release FIWP (Dynamic Planning) (level 5)
28) Execute FIWP
32) Conduct Q/C verification
33) FIWP completed?
35) Deliver FIWP and present results
CONSTRUCTION PHASE: CONSTRUCTION CONTRACTOR

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CONSTRUCTION PHASE: CONSTRUCTION CONTRACTOR

Implement and Release FIWP

Table of Contents

1. Constraints
2. Scope
3. Safety
4. QA/QC
5. Trade Coordination
6. Material Take Off
7. Scaffold Request
8. Equipment Request
9. FIWP Lookahead
10. Timesheets
11. Model Shots and Isos
CONSTRUCTION PHASE:
CONSTRUCTION CONTRACTOR

Execute FIWP

One of our silver-level sponsors - Phoenix Industrial - has incorporated their maintenance experience into the Phoenix WorkFace Planning approach.
CONSTRUCTION PHASE: CONSTRUCTION CONTRACTOR

Progress project
CONSTRUCTION PHASE:
CONSTRUCTION CONTRACTOR

What if execution doesn’t go according to plan?

RISK EVENTS

‘PLAN B’

BACKLOG
CONSTRUCTION PHASE:
OWNER

31) Review and update Engineering

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29) Need for extra information?

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33) FIWP completed?

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WorkFace Planning Lessons Learned:

- Conduct Lessons Learned at the end of each phase of the project
- Do ‘temperature checks’ during each phase
- At the end of the project, conduct a final Lessons Learned.
Two of our sponsors have been recognized by COAA, winning awards for their excellence and leadership in WorkFace Planning.
WORKFACE PLANNING
FROM CONCEPT TO COMMISSIONING
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