Workfront Management: l’integrazione tra Material Management, Planning e Costruzione

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Site Managers’ Dream….

Full availability of all materials

Technip
Site Managers’ Dream….

General Instruction (including needed TOOLS and QHSE)
Site Managers’ Dream….

Clear and complete Instructions
Site Managers’ Dream…. 

The PM shall grant this and Make It Happen!
Starting the Project….

Define the project Strategy on the basis of the contractual basis and constraints

- **Defining Workfronts, considering:**
  - WBS
  - Design Activities
  - Procurement campaign
  - Construction activities sequence
  - Site Milestone
    - Site Prep.;
    - Civil (Foundations & U/G)
    - Steel Structure and Equipment,
    - Piping Prefabrication and Erection

Finally in the first period the Schedule and the Workfronts Curves shall be defined to set the Baseline of the Project
Workfront Management

- **Workfront Analysis is essential for all critical chains in the projects:**
  - Piping Prefabrication work process
  - Piping Erection work process
  - Steel structures erection work process
  - Electrical/Instrument cables: installation (in case of underground cables)
  - …

- **Workfront Analysis needs to be executed during the life of the project:**
  - At Planning Stage
  - During Control and Review phase
  - During Construction phase at Site
Workfront Management by Planning during Project life

Planning stage

- **Work process strategy is defined in the Baseline Schedule, based on:**
  - IFC design documents plan (quantitative info, i.e. issued quantity % curve)
  - Material purchasing and availability plan (quantitative info, i.e. availability % curve)
  - Construction plan (quantitative info, i.e. physical progress % curve)
  - Conditions (in terms of quantitative info) to be fulfilled in respect of Project Execution Plan implementation:
    - Target workload availability for starting construction
    - Minimal back-up requirement
    - ...

- Then Baseline Schedule clarifies sequences that support Workfront
Piping Prefabrication work process
A typical case
# Piping Prefabrication Work Process
## A Typical Case

### Baseline Schedule – Work Process Sequences

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MAR</td>
<td>APR</td>
</tr>
<tr>
<td><strong>ENGINEERING</strong></td>
<td></td>
<td></td>
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<tr>
<td>+ CAD 3D Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Isometric Sketches &amp; Supports</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PROCUREMENT/ MANUFACT.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Piping Material Supply T.O. IDD1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Piping Material Supply T.O. IDD2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Piping Material Supply T.O. IFC1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Piping Material Supply T.O. IFC2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CONSTRUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Piping Prefabrication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Piping Prefabrication work process
A typical case

Quantity Plan at Initial Stage

- Isometric issue Plan
- Piping Purchasing Plan
- Prefabrication Plan

Graph showing progress over time with various plans and curves.
Workfront Management by Planning during Project life

Control and Review phase

- During project execution, with progressing of information, Workfront Quantity Plan shall be updated and monitored to insure the consistency at a specific moment of the current workload availability with that one defined at initial stage.

- Workfront Analysis shall be performed at key steps during the life of the project for all critical chains.

Workfront Management is a tool to support Project Manager decision: confirm the plan or implement corrective actions.
Piping Prefabrication work process
A typical case

Workfront Control and Rescheduling - Key Checking Steps

1st MTO done → Material purchasing plan review

After P&ID’s Last Issue for Detail Design, about 8 months before Start of Piping Prefabrication → ISO plan and Material purchasing/availability plan review

1st PO issued → Material availability plan review on the basis of actual info from Order

After ISO IFC issue start

Piping Prefabrication Subcontract award, about 3 ÷ 4 months before Start of Piping Prefabrication → Prefabrication Plan review to verify if current workload availability is supporting the start and feasibility of Initial Plan, and to freeze detailed subcontractor plan

Analysis performed on quantitative trends (Workfront Planning)

Control on Eng doc’s/Forecast Runs (Workfront Control)

TIMELY AVAILABILITY OF MTL FOR PREFAB

Time
Piping Prefabrication work process
A typical case

Updated Quantity Plan

ISO’s plan may be rescheduled
Fitting availability may be reduced
Prefabrication start may be modified
Is prefabrication plan still feasible?
FORECAST RUN: process

Possible other split by:
Priority,
Areas,
Materials,
Destination,
FORECAST RUN: process

- **Forecast Run \( t = \infty \)**
  - The Forecast Run at \( t = \infty \) compares the MTO (relevant to the selected portion of work) with all purchased materials (regardless delivery time).
  - The scope of this Forecast Run is to identify any missing materials (Shortage).

- **Forecast Run \( t = t + \Delta t \)**
  - The Forecast Run at \( t = \infty \) compares the MTO (relevant to the selected portion of work) to the material with ETA Site at \( t + \Delta t \).
  - The scope of this Forecast Run is to identify the «theoretical» additional workfront at \( t + \Delta t \), giving information to define any necessary action to correct and improve to reach the planned workfront (dedicated purchasing, air freight delivery...).

- **Forecast Run \( t = 0 \)**
  - The Forecast Run at \( t = 0 \) compares the MTO (relevant to the selected portion of work) to the material available in the Site Warehouse.
  - The scope of this Forecast Run is to identify the «actual» additional workfront and the relevant ISO list (ready to be handed over to the Subcontractor).

The Workfront is calculated counting ISOs with 100% of materials available only.
Other types of report can be generated with deeper details down to the single missing piece
Piping Prefabrication work process
A typical case

- At time of Piping Prefabrication Subcontract award, FORECAST RUNS are used to:
  - Confirm the target workload on selected work packages for the early stage of Prefabrication
  - Prioritizing the ISO batches issue focusing on weight volumes per Priority Area
Piping Prefabrication work process
A typical case

- **Before ISO’s IFC issues:** forecast runs based on:
  - Estimated Time of Arrival at Site of purchased material
  - Bill Of Materials by 3D Model
  - Time window of 3 ÷ 4 months

Forecast Contractual Prefabrication Start date: *end January 2009*

1st Assessment positive
Piping Prefabrication work process
A typical case

- After IFC issues start: forecast runs based on:
  - Estimated Time of Arrival at Site of purchased material
  - IFC Bill Of Materials

Forecast Contractual Prefabrication Start date: end January 2009

2nd Assessment positive
Piping Prefabrication work process
A typical case

Final Quantity Plan

The Workfront Planning by Materials, by Areas creates the best conditions to have, during Construction phase, positive Forecast Runs at Site and to support a selective appropriate Workfront availability.
Workfront Management

What under development

- As of today, Execution and Management Data on same subject are still spread in several tools
- The final objective is to develop an user friendly IT tool able to consolidate information from both “Execution” systems and “Planning” ones, and to produce reports suitable to manage the overall Workfront Planning and to allow Project Manager to make the most effective decisions in a timely manner

Input each data one time, at one location, for the use of everybody

Project Data 360° Browser aims at consolidating E P C tools together and also with planning and project management tools

Make decisions based on more quantitative data quickly accessible on a single interface
Project Data 360° Browser

Provide various browsing capabilities for details or overviews

Lists
Classic search of plant items, documents, comments or actions lists with detail pages with key information

Molecular view
Designed to navigate easily thanks to relationships between plant items, documents, actions & comments

Reports
Produce curves, bar charts, pies based on predefined queries with some flexibility in defining the parameters

“Colored” 3D reports
Provide plant items status with their surroundings in the plant 3D model

Constellation reports
Give at a glance Work Load status and help identifying key actions

Calendar view
Allow to see actions coming from any complex search on a schedule view
Thank you