Application of Project Control Fundamentals in a WFP Environment

J. Dees
N. Chavan

• OVERVIEW – Jimmy Dees
  – Organization structure and accountabilities
  – Brief history of the set-up of foundational principles and processes
  – Where we are today and the what we are trying to accomplish with planning effort
  – Set-up learning's

• PRACTICAL APPLICATION OF SYSTEM FOR MANAGEMENT (SFM) – Niteen Chavan
  – Syncrude’s process of applying WFP principles
OVERVIEW
Jimmy Dees
PROJECT CONTROL Fundamentals

PROJECT CONTROLS BASICS 101

• Know What has to be done… a detailed budget and tracking profiles which provide schedule and cost control baselines
• Know what has been done… reports providing actual performance data consistent with agreed upon baselines… and in a timely fashion
• Know how actual performance compares with performance norms… analysis of performance to date
• Know what remains to be done … forecast the potential result
• Identify and recommend corrective actions to bring performance in line with expectations … control
• Check results of corrective action … verify
Organization Structure

Project Business Services

established 2006

- Project Control Leaders
- Estimating Services
- Cost and Planning Services
- Support Services
- SAP Implementation
What we do

Goals
Cost
Predictability (portfolio)

Cost Effectiveness (project)

Cost Utilization (annual)

Why?
• Supports long range portfolio planning (how large is the wave?)
• Assures predictable ROI
• No “surprises”

How?
• Effective Schedule estimate & Cost estimate development process
• Early execution planning…(do-ability)
• Effective cost and schedule work processes and standards
• SFM initiatives (planning)
• Meaningful stewardship (weather forecaster vs. reporter)
• Effective contracting strategy

• Effective management of engineers/suppliers/contractors

• Predictable 1st, 2nd, 3rd, & 4th QTR forecasts (provide movement & flexibility of annual monies)

• Effective project controls
• Reliable financial information
QUICK HISTORY LESSON
How did we get here?

– Painful learning's… back to the future
– Had to re-establish some basic processes and tools
– Implement over the portfolio of projects
– Build confidence in the greater organization
Assessment Findings (April 2006)

PAINFUL LEARNING’S

• Identification and Tracking of projects thru the stages is a problem. (Name, TWR#, AFE#, W/O#, Job#, etc)
• Responsibilities of BA’s and PC’s varies by Strategy Center
• In most cases, costs are being captured by P-code but budgets are not being recorded by P-code
• Some PC staff are involved with preparation/coding of CWA’s, Workorders, etc. Many are not.
• With the exception of hours, no tracking of quantities is being done by Project Controls
• Reporting by Contractors is non-existent, verbal, or inconsistent
• Progress and earned-value reporting is inconsistent in both methods used to gather progress data and how it is reported
• There is limited information readily available for management decisions based on schedules and costs for Capital projects.
• Not a good handle of costs for projects “cradle to grave” (including reasons for escalation)
Establish “List of Projects”

**OBJECTIVE**

- To locate, consolidate and document ALL the lists that currently exist
- Establish some rules around naming and numbering of projects
- Establish rules around adding and deleting projects from the list
Building Estimating Competency

OBJECTIVE

• Establish estimating as a Core Syncrude Competency
• Establish a Professional Estimator Career Path with Documented Expectations for All Levels
• Establish Estimating Training Strategies and Plans
• Build Internal Estimating Competency to Manage, Direct and Review Estimating Workload
• Supplement with External Resources as Required:
  – Other Owners
  – Contracting agency
  – JV’s
Building Estimating Competency

**COMPLETED**

- Estimates prepared using standard project code of accounts (P-Codes)
- Estimates prepared reporting key unit quantities by major account
- Estimates prepared using standard Estimate Basis Memorandum and Estimate Confidence Packages
- Syncrude Estimate Tracking System (SETS) used to monitor all estimates prepared
Standard Estimate Preparation And Reconciliation

HARD OBJECTIVES
• All estimates summarized to ALEX format
  – [WHAT] Construction summarized by Major Code of Account (w/summary of key quantities and direct field hours). Hours tend to remain “static” while costs are “fluid”.
  – [WHY] It Supports “HARD” reconciliation between gates
  – [WHY] Allows for hi-level validation
  – [WHY] Begin to establish “Benchmarks”

Concerns
– Need earlier involvement during the Business Planning cycle
– Educate estimators as to “Why” this information is required
Standard Estimate Preparation And Reconciliation

SOFT OBJECTIVES

• Establish credibility with owners
  – We are able to communicate scope in way everyone understands
  – Helps identify execution risks earlier in the project life cycle

• Inspire confidence early on with the execution team
  – Team “feels” they have more control
  – Ability to make key execution decisions earlier in project life cycle
  – Puts us in a “planning” versus “reactionary” role
### WHY QUANTITIES?

- Engineer Quantities
- Purchase Quantities
- Construct Quantities

- “Force discipline within the Engineering house to design to the estimated quantities”
Project Control, Trending, Benchmarking Process

Estimate -> Control and Trend -> Final Benchmarking
NEXT STEP – CONTRACTOR PERFORMANCE INITIATIVE (SFM)
2007-08 Status
(re: tools to effectively manage)

STATUS

• Limited metrics are historical, not forward looking
• Current metrics do not drive discussion or continuous improvement
  – Reporting is focused on accounting numbers rather than contractor performance (i.e. Wage rate, productivity against agreed target, progress against plan, field in-directs against plan, etc.)
• Limited understanding of performance drivers
• Limited understanding of performance norms
Case for Change (understanding performance norms and drivers)

CHANGE NEEDED

• Stewardship reporting is informational rather than changing behaviors and outcomes. Does not address Owner or contractor performance and barrier removal
• Lack of integrated planning / scheduling details (daily / weekly / monthly)
• Contractor planning and execution not validated (quality)
• Limited follow-up on planning and execution
• Unclear roles, responsibilities and accountabilities
• No systematic barrier resolution / continuous improvement process
LEARNINGS

• Had to overcome heavy investment in current processes
  – “this is the way we’ve always done it”
• Need improved teamwork and collaboration between SCL management and contractors
• Roles and responsibilities should be better defined
• Recommended metrics need to be better understood
• Cultures and capabilities varied greatly between contractors
  – Insufficient technical and management skills
  – Need to reward innovation versus compliance
Must measure performance to properly forecast cost and schedule at completion. Formulates achievable target (based on benchmarks) at AFE... health and wellness of project in relation to target.
Stewardship and The SFM

REPORTING

• Project reporting: Weekly and Monthly
  – Dashboard reporting implemented on all projects utilizing SFM (minimum)
  – Metrics tracked:
    • PF over time
    • Field Indirects over time
    • Progress and schedule attainment over time
    • Plus other financial metrics

• Portfolio reporting: Frequency aligned with quarterly scorecard calendar
  – Same metrics as Project reporting
**Next Steps**

**ACTIONS**
- Set benchmark (time on tools)
- Revisited stewardships to align with new focus & direction
  - Move from accounting focus to contractor performance focus
  - Align on metrics (daily, weekly, monthly)
  - All levels (Project, Department, Business Unit)
- Put in place “core” implementation group
  - Retained “key” pilot members to lead effort
  - Empowered them…
  - Finalized tools (use of existing systems+)
  - Prepared training package for contractor, rolled-out, etc.
- Continue to monitor, measure and maintain
PRACTICAL APPLICATION System for Management (SFM)

Niteen Chavan
Workface Planning and Project Control Process

Processes

CWP/EWP’s

Workface Planner

Inputs
Superintendent, GF, Foreman, Construction team

Develop Field Installation Work Package

FIWP Package

Project Controls

Construction Schedule
Estimation
Cost Coding
Crew Size, Material & Equipment Planning
Progress Measurement
Reporting

SFM
Work Breakdown Structure

CWS – AWS – CWP/EWP – FIWP

- CWS – Contractors Work Scope
- AWS – Area Work Scope (Physical area OR plant, OR a specific system/sub-system OR combination of Plant/Area/System)
- CWP/EWP – Construction Work Package / Engineering Work Package

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>FIWP Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil</td>
<td>40,000 hrs</td>
<td>1000 hrs</td>
</tr>
<tr>
<td>Pipe</td>
<td>10,000 hrs</td>
<td>1000 hrs</td>
</tr>
<tr>
<td>Elect</td>
<td>20,000 hrs</td>
<td>1000 hrs</td>
</tr>
</tbody>
</table>

P: Piping
C: Civil
S: Structural
F: Electrical
Use System for Managing tools to manage the daily work, remove barriers and improve performance
Our daily Behaviors of detail daily planning makes the difference

Use System for Managing tools to manage the daily work, remove barriers and improve performance
7 Key Tools make up the System for Managing

1. Hours Quantity Plan (HQP)
2. Daily Schedule Control
3. Project Shift Meeting
4. Weekly Performance Report
5. Weekly Update Meeting
6. Barrier Identification Chart
7. Barrier Action Log
## HQP – Hours, Quantity Planning

### Current Month Dec’09

<table>
<thead>
<tr>
<th>P CODE</th>
<th>DESCRIPTION</th>
<th>UOM</th>
<th>1st Wk</th>
<th>2nd Wk</th>
<th>Total Month</th>
<th>Jan’10</th>
<th>Feb’10</th>
<th>Total</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Plan</td>
<td>Actual</td>
<td>Plan</td>
<td>Plan</td>
<td>Plan</td>
<td>Plan</td>
</tr>
</tbody>
</table>

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

### Total Direct Field Hours (Labour)

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

### Total Indirect Field Staff Hours (Labour)

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

### Total Dir + Ind Field Hrs (Labour)

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

### Total (only P34) Indirect Hours (Preparation)

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

### Quantity Progress & Measurement

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

|        |             |     | Plan   | Actual | Plan        | Plan   | Plan   | Plan  |

### Planning / Scheduling - Assumption / Schedule Basis Memorandum:

- **Current Month Dec’09**
- **Total Direct Field Hours (Labour)**
- **Total Indirect Field Staff Hours (Labour)**
- **Total Dir + Ind Field Hrs (Labour)**
- **Total (only P34) Indirect Hours (Preparation)**
- **Quantity Progress & Measurement**

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**Notes:**
- Plan vs. Actual for each category.
- Total summary at the end of each category.
- Specific data entries for different tasks and quantities.
## Daily Schedule Control - Plan

### Daily Schedule Control

<table>
<thead>
<tr>
<th>Activity / CWP</th>
<th>Schedule Location</th>
<th>Workforce Count</th>
<th>Workforce Hours</th>
<th>Unit Of Work</th>
<th>Equipment Hours</th>
<th>% Complete</th>
<th>OT Hours</th>
<th>Barrier Hours</th>
<th>Barrier Code</th>
<th>Comments</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Plan</td>
<td>Actual</td>
<td>Plan</td>
<td>Actual</td>
<td>Plan</td>
<td>Actual</td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
</tr>
</tbody>
</table>

### Foreman:

**Shift Summary**

**Notes:**

**Shift Turnover Comments:**
Objective of the Daily Project Shift Meeting is to:

- Review performance variance from last shifts plan
- Prioritize resources on daily schedule control.
- Set clear and specific expectations.
- Identify immediate barriers.
- Review & remove barriers as required.
- Inform Construction Specialist of barriers requiring his/her help
## Weekly Performance Report

<table>
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<tr>
<th></th>
<th>Mon</th>
<th>Tue</th>
<th>Fri</th>
<th>Weekly Total</th>
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<tbody>
<tr>
<td></td>
<td>Plan</td>
<td>Actual</td>
<td>Plan</td>
<td>Actual</td>
</tr>
<tr>
<td>Headcount (Dir+Ind Labour)</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Direct Field Hours</td>
<td>100</td>
<td>75</td>
<td>200</td>
<td>150</td>
</tr>
<tr>
<td>Indirect Field Hours</td>
<td>50</td>
<td>75</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>Total Equipment Hours</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Total Lost Time Hours</td>
<td>10</td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Quantity (UOM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Tasks / Activities</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Overtime Direct Hours</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>
### Weekly Performance Report – KPI’s

**Key Performance Indicators (KPI) Weekly:**

1. **Schedule Attainment (SA)**
   - Planned tasks/qty
   - Actual tasks/qty completed
   -

2. **Workforce Utilization (WU)**
   - Planned (Dir + Ind) Hrs
   - Actual (Dir + Ind) Hrs
   -

3. **Overtime Workhours (OT)**
   - Total Direct Field Hrs
   - Actual OT Craft Hrs
   -

4. **Equipment Utilization (EU)**
   - Planned Equip. Hrs
   - Actual Equip. Hrs
   -

5. **Headcount Utilization (HU)**
   - Planned headcount
   - Actual Headcount
   -

6. **Lost Time Hours (LTH)**
   - Actual Lost Time Hrs
   -

7. **Labour Prod. Factor (PF)**
   - Total Hours Earned
   - Total Hours Actual
   -

8. **Constr. Prod. Unit Rate**
   - Actual Direct Work Hrs
   - Actual Installed Qty
   -

9. **Prod. Est. Performance**
   - Actual Prod Unit Rate
   - Est. Prod. Unit Rate
   -

10. **Wage Rate**
    -

11. **Indirect to Direct Ratio**
    -

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KPI’s generated through data base

Standard Project KPI’s generated through ALEX
The SFM elements all come together in this meeting
Weekly Update Meeting

The purpose of the Weekly Update Meeting is to review and discuss the status of the project, discuss and address barriers and take a two week look ahead.

**Weekly Performance**
- Analysis of Weekly Performance Report: Schedule Attainment, Headcount Utilization, Workforce & Equipment Hours
- Analysis of Hours, Quantity Plan: Overtime, Workforce Utilization

**Barriers**
- Analysis of Barrier Identification Chart
- Review and develop Barrier Removal Action Plans

**Two Week “look ahead”**
- Review of Contractor Schedule
Barriers

• Barrier:
  – Anything which takes time away from the completion of a planned work activity in that shift.

• Not a Barrier:
  – Normally scheduled non-work items such as toolbox talks or weekly safety meetings unless their duration is longer than the defined amount of time.

• Expectation:
  – 90% of all barriers are solved at the work site by the Foreman/GF/CS
Barrier Identification Chart - Weekly

Report Date Range From: 17-Jan-2010 To: 07-Mar-2010

INCLUDED BARRIER CODES: ALL BARRIER CODES

Wednesday, March 03, 2010

Chart Total Barrier Hours: 447
<table>
<thead>
<tr>
<th>#</th>
<th>Meeting Date</th>
<th>Issue</th>
<th>Action</th>
<th>Comments</th>
<th>Responsibility</th>
<th>Due Date</th>
<th>Status</th>
<th>Days Past Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25-Nov-09</td>
<td>MATERIAL</td>
<td>WORK IN PROGRESS - SANFORD</td>
<td>CDSYN</td>
<td>SANFORD/ Neil Wilson</td>
<td>JAN 21/10</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>25-Nov-09</td>
<td>OSPRIANS WAY</td>
<td>USE BRITLING</td>
<td>SPARE</td>
<td>DAVE CLARKE</td>
<td>DEC 1/09</td>
<td>COMPLETED</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>02-Dec-09</td>
<td>Pipe weld Cracking/ weld material</td>
<td>IRA-Ring is too small for the pipe Capital is immediately working to resolve Capital Group Will impact Schedule Eng - IRA CORE (Trevor Duke)</td>
<td>ASAP</td>
<td></td>
<td></td>
<td>COMPLETED</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>09-Dec-09</td>
<td>Neptune stuck in mud</td>
<td>Dig up road in Jan</td>
<td>Schedule Delay</td>
<td>Greg Day</td>
<td>12-Jan-10</td>
<td>COMPLETED</td>
<td>Train outages on Dec 11/09</td>
</tr>
<tr>
<td>5</td>
<td>09-Dec-09</td>
<td>IRA-Cored hangers</td>
<td>Switch to blanket</td>
<td>3 Day Delivery</td>
<td>Greg Day</td>
<td>16-Dec-09</td>
<td>COMPLETED</td>
<td>Blankets have arrived</td>
</tr>
<tr>
<td>6</td>
<td>09-Dec-09</td>
<td>Delay in welding start Cost 32 WEEKS as per schedule</td>
<td>Look at Modified shift or more machines</td>
<td>To pull back schedule</td>
<td>Dave Clarke Neil Wilson</td>
<td>6-Jan-10</td>
<td>COMPLETED</td>
<td>Working day/night back on schedule</td>
</tr>
<tr>
<td>7</td>
<td>16-Dec-09</td>
<td>Demolition of Filer &amp; PW</td>
<td>AEPR FER to arg</td>
<td>First failure waiting on outage</td>
<td>Dave Clarke John Allen</td>
<td>30-Mar-10</td>
<td>OPEN</td>
<td></td>
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<tr>
<td>8</td>
<td>16-Dec-09</td>
<td>Cold snap for a week</td>
<td>Lost scheduled hours due to cold snaps - include contractors home</td>
<td>Schedule Delay</td>
<td>Dave Clarke Neil Wilson</td>
<td></td>
<td>COMPLETED</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>06-Jan-10</td>
<td>Neptune drill bit worn</td>
<td>Push through sand area and replace head</td>
<td>Schedule Delay</td>
<td>Dave Clarke Doug O'Leary</td>
<td>13-Jan-10</td>
<td>COMPLETED</td>
<td>Withdraw to complete</td>
</tr>
<tr>
<td>10</td>
<td>13-Jan-10</td>
<td>Weld Cracks</td>
<td>Acorn to compete test</td>
<td>Schedule Delay</td>
<td>Trevor Duke</td>
<td>20-Jan-10</td>
<td>OPEN</td>
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<tr>
<td>11</td>
<td>13-Jan-10</td>
<td>Turnover Packages</td>
<td>Why is it taking so long - Greg to talk to John</td>
<td>Turnover delay for operations</td>
<td>Trevor Duke Greg Day</td>
<td>30-Jan-10</td>
<td>OPEN</td>
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<tr>
<td>12</td>
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</table>
Barrier Removal Process

Contractor identifies barrier as it happens or from daily reports, and attempts to solve

Barrier Removed?

Work on next barrier

YES

Assigned to CS / GF for resolution

Barrier Removed?

Work on next barrier

NO

Discuss top Barriers in Monthly Stewardship Meeting. Address and assign unsolved barriers.

Discuss Barrier in weekly meeting, assign and enter into Action Log
Questions?