Constraint Satisfaction:

Scaffolding

Mick Herke
Director & General Manager
Aluma Systems

Frank Engli, P.Eng.
Turnaround Manager
Shell Canada Limited

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Constraint Elements

Client Perspective

- Scaffold is the foundation for successful execution for others' work
  1. Safety
  2. Quality
  3. Cost
  4. Schedule

Interchangeable depending on Client
Constraint Elements

Safety

- Ensuring safety of scaffold provider
- Ensuring safety of scaffold user
Constraint Elements

Quality

• Scaffold integrity
• QC and tagging
• on going QC
• Built for purpose
• Multi use
Constraint Elements

Cost

• Alternatives to scaffolding
  • Rope Assess, man lifts, steps/ladders
  • Horses, portable shields

• Build it once
  • Fit for total scope, avoid rework
  • Clarify demands
Constraint Elements

Schedule

• Preplanning (WFP)
• aligning with other parties
  • priority, schedule and scope
• Clear deliverables
  • Installation, Tear down
Holistic Operational Model

Customer Value

Operational Discipline

Safety + Cost + Quality + Schedule

Process

Tools

KPI’s

People
Safety Observation System (SOS)

Building an Observation / Intervention-based Safety Culture

- 10,000 Craftpersons
- 1,100 Field Supervisors
- 120,000 HELP Cards
- 50,000 SOS Observations
- 300 Managers
- 1,800 SMT Management Audits
- 10,000 Employees Intervention Trained
- 150 Safety Professionals
- 100 Gold Link Audits

# Employees Engaged
# Observations

- 10,000 Employees
- Intervention Trained

Time

- 2005: 2 days
- 2007: 2 hours
- 2009: 15 Mins
- 2011: 3 Mins

SOS is part of Aluma’s evolution to ...
- Engage entire workforce in Site Safety
- Drive proactive Risk Management
- Collect data for focused Safety improvement
- Reduce Incidents through Observation / Intervention
- Objectively Measure our Safety Culture

SOS Program
5-Step Overview / Advantages

1. Setup & Train Site Team on SOS
2. Conduct Observations using standard 7-Area Form
3. Enter Observation data in SOS database
4. Review Reports / Trends
5. Develop Action Plans addressing At-Risk Trends

Advantages
- Proactive Identification of At-Risk Behaviors
- At-Risk Trend Analysis (At Site, Brand-wide, Over Time)
- Assists in developing focused safety improvements
- Formalizes managing 'bottom of the Incident Pyramid'
- Measuring Intervention and Supervisor accountability
**Wrench Time Improvements**

- **Boiler Founding Sys:** Reduces one shift in I&D
- **Open center Boiler:** Saves 25% on T&M
- **Metal Toe-board:** 60% on T&M
- **Floating Boiler Deck:** Saves 75% on labor & 85% on material
- **Boiler Bracket:** Eliminates entire scaffold lane
- **Clamp on Leg:** Reduces 4 pieces & 50% on labor
- **Guardrail Base:** Increases safety & productivity
- **Heavy Leg:** Capacity increase 66%, 50% reduction in material
- **Plank Infill:** Eliminate wires and saves 50% on Labor
- **Generator Deck:** Reduces cycle time by two days
- **Aerogel Insulation:** 70% on labor & 30% on material

**Indirect Overhead Cost-Savings**

- **Multi-craft:** Reduces 45% of OH
- **SIMS:** Overall 5% + increase in project productivity
- **BrandNet:** Most advanced Scaffold Management, Estimating, Scheduling & Forecasting
- **Profield & P6:** Superior resource allocation and cost tracking
- **New Carts/Scaffold Mobile Yards:** Reduces labor hours by bringing material closer to units

**Non-Wrench Time Improvements**

- **Schedule Of Discounts:** Prepaid or Net 10 Terms..1% to 1.5% Saving
- **Client Overhead /Craft Reductions- Multi-craft:**
  - Over 7.5% Savings!
  - Reduces 200 Plus Permits Per Year Per Craft over 1% savings
- **Contractor Execution Premiums / Productivity**
  Reduces craft support personnel, maximize craft … 10% Savings!
Execution Excellence - Product Quality Management System

**Quality Improvement Reporting**
Documented problems, solutions and corrective actions allowing multi-user input to continuously control and improve quality.

**Vendor Qualification Program**
Rigorous evaluation process to ensure delivery of high quality products.

**Vendor Audits**
Periodic auditing to ensure compliance to established manufacturing guidelines.

**Field Assembly & Maintenance Manuals**
A series of instructions to assemble, service, and repair rental equipment in a consistent manner. Point-of-use continual inspections assure compliant materials.

**Lot Tracking**
Traceability Stamps on every piece of equipment for tracking to implement corrective / preventive measures when needed.

**Product Testing**
*Recorded* Execution Excellence - Product Quality Management System
In-house testing of components and assemblies using industry best practices for load testing assures maximum safety and productivity.

**A Commitment to Excellence**
1. **Scaffold Design**
   - Supports all types of scaffold
   - Designs with simple parameter inputs
   - Accommodates any configuration
   - Easy to design/change…deck levels, guardrails, ladders, toe-boards, cages at various heights
   - Accommodates towers, straight runs, inside/outside circular, birdcage, redcross etc designs
   - 3D design capabilities

2. **Estimation**
   - Detailed Material and Labor costing estimates at project and scaffold Level
   - Labor rate packages estimates with varying crew mixes
   - Detailed reports
3. Planning & Forecasting

- Material Forecasting on component quantities, weight or total time for duration of project and for each time interval
- Labor Forecasting on man-power requirements for the duration of project and for each time interval
- Gantt charts, task tree table, forecasting charts
- Ability to integrate forecasting data to customer project management software

4. Project Management

- Comprehensive schedule and plan for scaffold erection and dismantling
- Ability to break down entire project into smaller projects
- Detail and summary reports on all project level…. BOM, Count Sheet, Labor Timesheet, Bottom-line, Scope of Work.
- Accountability & comparisons with actuals vs estimates