Agenda

- A brief historical perspective
- Systems Thinking
- Systems Approach – Case Study
- Risk Assessment – TaBra
- Q&A
1970’s – Enforcement Era

- Nine Mile Point – Winter 1977
  - Rebar Containment Wall Collapse
  - 7 Dead
  - OSHA cited “Rebar Guy Wire” requirement

- Willow Island – Spring 1978
  - Cooling Tower – Scaffolding failure
  - 51 dead
  - OSHA/NIST Cited “Safety Lapses”

- Three Mile Island – Spring 1979
  - Worst Nuclear Incident is US History
  - Mechanical, Operational, Man-Machine Interface failures Cited
  - Systems Thinking Investigation – Connecting the Dots
  - Nuclear construction across the USA Halted
  - 50,000 + workers died in this decade
1980’s - Management Era

- Major catastrophic incidents continued world-wide
  - Union oil refinery – Illinois – 19 Killed
  - Chicago Tylenol Murders
  - Bhopal – Thousands Killed, Hundreds of thousands injured
  - Chernobyl – you know the story
  - Norco Disaster – Shell Oil Refinery Explosion
  - Exxon Valdez

- Management systems connecting to regulatory compliance begins to take hold…

- 50,000+ USA workers died in this decade
1990’s – Behavioral Era

- Kader Toy Factory fire, Taiwan – 188 killed
- Hamlet Chicken Plant Fire – 25 Killed
- Namibija Mine Disaster – 300 Killed
- 50,000 + USA Workers died in this decade
- Employee Behavior becomes a focus
2000’s – Management Systems Era

- Texas City Refinery Explosion – 15 dead, 100 injured
- Georgia Sugar Refinery – 13 killed, 42 injured
- Deep water Horizon – 11 killed, untold environmental
- Connecticut Power Plant Explosion – 5 killed
- Fukushima Japan – Nuke Plant Failure

Investigations are becoming sophisticated – root cause investigations focus on the entire management system

- Another 50,000 + die in this decade – Why?
- Is there a solution?
Possibly the most important standard that will affect workplace health and safety during the next 5 to 10 years
Compliments ANSI Z690 Risk Management Standard
Significant Terminology shift from safety to risk management
Obvious connection to the management system as a whole.
Management System Standards and Guidelines

- ANSI/ASSE Z10 2012
- ANSI Z690
- OHSAS 18001
- ISO 9001 Quality
- ISO 14001 Environmental
- International Labour Organization (ILO)
- VPP
<table>
<thead>
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<td>1.1</td>
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<td>1 Objectives</td>
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<td>1.3</td>
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<td>1.2 Application</td>
</tr>
<tr>
<td>2</td>
<td>Definitions</td>
<td>3 Terms and definitions</td>
<td>3 Terms and definitions</td>
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<td>---</td>
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<td>Management Leadership and employee involvement</td>
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<td>3.1.1</td>
<td>Occupational Health and Safety Management System</td>
<td>4.1 General requirements</td>
<td>4.1 General requirements</td>
<td>3 The occupational safety and health management system in the organization</td>
<td>Management Commitment, 5.1</td>
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<td>3.1.2</td>
<td>Policy</td>
<td>4.2 Environmental Policy</td>
<td>4.2 OH&amp;S policy</td>
<td>3.1 Occupational safety and health Policy</td>
<td>Management Commitment, 5.3</td>
<td>Quality Policy</td>
</tr>
<tr>
<td>3.1.3</td>
<td>Responsibility and Authority</td>
<td>4.4.1 Resources, roles, responsibility and authority</td>
<td>4.4.1 Resources, roles, responsibility, accountability and authority</td>
<td>3.3 Responsibility and accountability</td>
<td>Disciplinary System, 5.5.1</td>
<td>Responsibility authority</td>
</tr>
<tr>
<td>3.2</td>
<td>Employee Participation</td>
<td>---</td>
<td>---</td>
<td>4.4.3.2 Participation and consultation</td>
<td>3.2 Worker participation</td>
<td>---</td>
</tr>
</tbody>
</table>
Where does process/system improvement come from?

PDCA

**PLAN:** Design or revise business process components to improve results

**DO:** Implement the plan and measure its performance

**CHECK:** Assess the measurements and report the results to decision makers

**ACT:** Decide on changes needed to improve the process
ANSI/AIHA Z10 focuses primarily on the strategic levels of policy and the processes to ensure the policy is effectively carried out. The standard does not provide detailed procedures, job instructions or documentation mechanisms. Each organization must design these according to their needs.
ANSI Z10 – Seven Sections

- 1.0 Scope, Purpose, & Application
- 2.0 Definitions
- 3.0 Management Leadership and Employee Participation
- 4.0 Planning
- 5.0 Implementation and Operation
- 6.0 Evaluation and Corrective Action
- 7.0 Management Review
ANSI Z10 – Fifteen Appendices – Clear shift to Management Systems

A. Policy Statements (Section 3.1.2)
B. Roles and Responsibilities (Section 3.1.3)
C. Encouraging Employee Participation (Section 3.2)
D. Planning-Identification, Assessment and Prioritization (Section 4)
E. Objectives/Implementation Plans (Section 4.3 and 4.4)
F. Risk Assessment (Section 4.1 & 5.1.1)
G. Hierarchy of Control (Section 5.1.2)
H. Management of Change (Section 5.1.3)
I. Procurement (Section 5.1.4)
J. Contractor Safety and Health (Section 5.1.5)
K. Incident Investigation (Section 6.2)
L. Audit (Section 6.3)
M. Management Review Process (Section 7.1 and 7.2)
N. Management System Standard Comparison (Introduction)
O. Bibliography and References

**Bold** – New Appendices in 2012 Standard
Key Concepts and Ideas

Beliefs
Assumptions
Mental Models

Systems Thinking
The concept of “Systems Thinking”, as defined by Peter Senge, prolific author and director of the Center of Organization Learning at MIT’s Sloan School of Management, is this.

- “Discipline for seeing wholes and understanding how things influence one another within the whole.
- Framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots.
- Set of specific tools and techniques of feedback and the engineering theory to understand systems.”

The concept of “Systems Thinking”, as defined by Peter Senge, prolific author and director of the Center of Organization Learning at MIT’s Sloan School of Management, is this.

- What lens are you looking through?
Not applying the “Systems Thinking” approach will:

- Result in decisions and actions that are made in isolation; decisions that are made in a void without determining the consequences to other systems.

- Result in poor or inefficient management systems; poor crisis management; and the wasting of energy and financial resources.

- Are you a “Safety First” philosopher?
- Do you have a seat at the table or watching?
- Can you speak business management?
Applying “Systems Thinking” approach:

- Recognizes that all “systems” are influenced by the larger system in which it operates. *In all cases*, the “safety system” is influenced by the “operations and engineering systems”
- Questions all decisions and actions. Means and methods for providing operational management are established through investigations, feedback, and by establishing a partnership with all employees to achieve joint performance objectives.
- Develops an understanding and appreciation of global short-term and long-term consequences of any action or decision made.
- Focuses on cyclical rather than linear cause and effect.
- Problem-solves by viewing "problems" as parts of an overall system, rather than reacting to specific parts, outcomes or events, which only contributes to further development of unintended consequences.
- Creates system interfaces.
- We have to stop trying to change the system, we have to change!
21st Century Systems Thinking Skills – Mind Map

21st Century Systems Thinking Skills

CREATIVE THINKING
- Overcome obvious solutions with unwanted side effects
- Mind mapping
- Concept mapping
- Lateral thinking
- Brainstorming
- TRIZ and ASIT
- Use various supporting tools and methods
- Surprise others and have fun

SYSTEM AS A CAUSE
- Don’t accuse others
- To find a problem cause, uncover the systems’ structure first
- Seek for opportunities to learn and change
- Hard structure
- Soft structure
- Mental models
- Policies
- Physical world

10 MILES VIEW
- Overcome the influence of situation
- Expand your perception
- Problem boundaries
- Time
- Try to see both trees and forest

CLOSED-LOOP THINKING
- Find feedback loops of causal relationships
- Reinforcing
- Balancing

NONLINEAR THINKING
- Use policies as a leverage
- Try to find small changes with big effects
- Action and reaction need not to be closely linked
- In time
- In space
- In strength

SCIENTIFIC THINKING
- Quantify and measure
- Formulate and test hypotheses

OPERATIONAL THINKING
- Think in the same way as things are already happening
- Be consistent in units of measurement

DYNAMIC THINKING
- Search for recurrent patterns of behaviour over time
- Don’t overestimate events
- Think in continuous terms
- Try to perceive impacts of small changes

Based on thoughts of Barry Richmond and George...
OS&H **Programs** vs. OS&H Management **Systems**

**Programs**  *Focus on compliance*

`INPUT` → PROCESS → `OUTPUT`

**Systems**  *Focus on performance*

`INPUT` → PROCESS → `OUTPUT`

**Feedback Loop**

(evaluation mechanisms, performance, organizational and worker S&H continual improvement)
Management Systems

- **Programs** are required by governmental entities
- **Programs** are simpler than OS&H **systems**
- **Systems** are voluntary and contain more substance; they are proactive
- **Programs** do not reflect **system**-thought or structures; they are reactive
- **Programs** are contained within a **system**
OS&H Management Systems

- Hearing Conservation Program
- Respiratory Protection Program
- Hazard Communication Program
- Confined Space Program

<table>
<thead>
<tr>
<th>Policy</th>
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<tr>
<th>Planning &amp; Implementing</th>
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<table>
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<tr>
<th>Action for Improvement</th>
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</table>
Section 1

1.1 Scope
Defines minimum requirements for an occupational health and safety management system (OHSMS).

1.2 Purpose
Provide a management tool to reduce the risk of occupational injuries, illnesses, and fatalities.

1.3 Application
Applies to all organizations.
Section 2 Definitions

- Audit
- Compliance
- Conformance
- Continual Improvement
- Contractor
- Corrective Action
- Document (noun)
- Documented (verb, adjective)
- Employee
- Employee Representative
- Ensure
- Exposure
- Exposure Assessment

- Hazard
- Non-conformance
- Occupational Health Assessment
- Occupational Health and Safety Management System (OHSMS)
- OHSMS Issues
- Organization
- Preventive Action
- Record
- Risk
- Risk Assessment
- Top Management
A Systems Integration Case Study – With emphasis on Section 3 – Management Leadership and Employee Involvement
1. Introduction
2. The “Plan”
3. The “Do” Strategies
4. The “Check” Process
5. The “Act” Path Forward
Learning Objectives

- The simplicity of Z-10
- How to take advantage of the Plan-Do-Check-Act Cycle
- How to evaluate your program and “Plan” for success
- How to implement the plan and “Do” it right
- How to “Check” your plan and implement corrective actions
- How to “Act” upon information and plan for improvement
M.C. Dean Overview

The Nation’s Premier Electrical Design-Build and Systems Integration Firm for Complex, Mission-Critical Organizations

M.C. Dean, Inc. is ranked the 2\textsuperscript{th} largest electrical firm by *Engineering News-Record* in 2012.

- $820M Annual Revenue
- Established 1949
### Sample List of Clients

Over 5,000 clients served on-time and on-budget worldwide

<table>
<thead>
<tr>
<th>Department</th>
<th>University</th>
</tr>
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<tbody>
<tr>
<td>Department of Defense</td>
<td>University of Virginia</td>
</tr>
<tr>
<td>Department of State</td>
<td>University of Maryland</td>
</tr>
<tr>
<td>Department of the Navy</td>
<td>Georgetown University</td>
</tr>
<tr>
<td>Department of Homeland Security</td>
<td>George Mason University</td>
</tr>
<tr>
<td>Department of Energy</td>
<td>James Madison University</td>
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<tr>
<td>National Park Service</td>
<td>The Boeing Company</td>
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<td>United States Mint</td>
<td>BAE Systems</td>
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<td>United States Coast Guard</td>
<td>Lockheed Martin</td>
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<td>Micron Technologies</td>
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<td>United States Central Command</td>
<td>Infineon</td>
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<td>United States Southern Command</td>
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<td>United States Army Corps of Engineers</td>
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<td>Naval Facilities Engineering Command</td>
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<td>United States Embassies</td>
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<tr>
<td>Federal Trade Commission</td>
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<tr>
<td>Social Security Administration</td>
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<td>United States Census Bureau</td>
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<td>Library of Congress</td>
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<tr>
<td>Smithsonian Institution</td>
<td></td>
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<tr>
<td>National Institutes of Health</td>
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<tr>
<td>Fort Belvoir Community Hospital Center</td>
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<td>Walter Reed National Military Medical Center</td>
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<tr>
<td>Johns Hopkins Hospital</td>
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<tr>
<td>All Children’s Hospital</td>
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<tr>
<td>African Command</td>
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<td>European Command</td>
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<tr>
<td>Space and Naval Warfare Systems</td>
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<td>Command Atlantic</td>
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<td>Dulles International Airport</td>
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<td>Ronald Reagan Washington National Airport</td>
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<tr>
<td>Hartsfield-Jackson International Airport</td>
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<td>Baltimore Washington International Airport</td>
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<td>Orlando International Airport</td>
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<td>Washington D.C. Department of Transportation</td>
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<td>Washington Metro Area Transit Authority</td>
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<td>Metropolitan Atlanta Rapid Transit Authority</td>
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<td>Los Angeles Sheriff’s Department</td>
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<td>Federal Bureau of Prisons</td>
<td></td>
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<tr>
<td>Wesley Brown Field House, U.S. Naval Academy</td>
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<tr>
<td>Wesley Brown Field House, U.S. Naval Academy</td>
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</tbody>
</table>
Challenges and Barriers

1. Unacceptable Program Assessment Results
   b. Regulatory Compliance – 1926/1910/EM 385 1-1 (Sample Gap Analysis Included)
   c. Relative Culture Score – Deficient – Quantitatively Undetermined (DuPont in planning stages)
   d. Safety Department Program vs Management-Driven Process
   e. Institutional Lack of Knowledge re: Best Management Practices
   f. Limited management and/or employee involvement
Safety Excellence Requires A Culture Shift
Involvement / Ownership by All Employees

DuPont Bradley Curve

Injury Rates
- Safety by Natural Instinct
- Compliance is the Goal
- Delegated to Safety Manager
- Lack of Management Involvement

Supervision
- Management Commitment
- Condition of Employment
- Fear/Discipline
- Rules/Procedures
- Supervisor Control, Emphasis, and Goals
- Value All People
- Training

Self
- Personal Knowledge, Commitment, & Standards
- Internalization
- Personal Value
- Care for Self
- Practice, Habits
- Individual Recognition

Teams
- Help Others Conform
- Others' Keeper
- Networking Contributor
- Care for Others
- Organizational Pride

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Planning Strategies

Program Development

- CEO commitment to World-Class Excellence
- Management Leadership and Employee Involvement as cornerstone to process improvement - Beyond Support
- Changing the way we think (Soft Approach to a Hard Problem)
- Z 10 Changes Company Philosophy
- Questioning Attitude – Started with One Question
- Educating the workforce
“DO” – Implementation of the Plan

Strategies Program Implementation

- World-wide training and education effort
- Site-specific Accident Prevention Plans
- Zero Incident Techniques
- ORM Five - Core Functions
- Six Elements of Control
  - 3 Strategic “Plan-Its”
  - 3 Tactical “Do-Its”
- Employee Involvement
  - Mobley Board
Five Core Functions of ORM

1. Define the Scope of Work
2. Analyze the Hazards
3. Develop and Implement Hazard Controls
4. Perform Work Within Hazard Controls
5. Provide Feedback and Continuous Improvement
“Making Zero Accidents A Reality” (CII)

- Review Construction Industry Facts
- Recap of the 1993 Zero Accidents Study
- Summarize the research methodology
- Reveal best practices identified
- Summary and Questions
Nine Construction Industry “Bedrock” Best Practices

Getting to Zero

• Demonstrated management commitment
• Staffing for safety
• Safety planning – pre-project / pre-task
• Safety training and education
• Worker involvement and participation
• Recognition and rewards
• Subcontractor management
• Accident/incident reporting and investigation
• Drug and alcohol testing
Demonstrated Management Commitment

- How frequently does top management participate in investigations, audits & operational risk reviews?
# Project Risk Register - After Improvement

## M.C. Dean Corporation Occupational, General Liability, and Security Risk Analysis Worksheet

### Legend
- In Progress (Subcontractors)
- In progress (M.C. Dean)
- Completed

### Project Information
- Project: [Project Name]
- Date of assessment: Updated [Date]

### Definable Features of Work - Risk Register/Assessment

<table>
<thead>
<tr>
<th>Activity</th>
<th>Progress</th>
<th>Trending Area</th>
<th>Yes or No</th>
<th>Start Date</th>
<th>Hazard</th>
<th>Harm / Exposure Potential</th>
<th>Site</th>
<th>Others</th>
<th>Probability of Occurrence (FJOASV)</th>
<th>Potential Severity (CLAJIN)</th>
<th>Overall Risk Assessment Code (RAC)</th>
<th>RAC Score</th>
<th>Elimination by Design</th>
<th>Guarding</th>
<th>Warnings</th>
<th>Special Procedures, Training, Audits, AHA’s, Regulatory Citations</th>
<th>PPE and/or Monitoring Equipment</th>
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<tr>
<td>01</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<td></td>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>Proper lift techniques, Adequate workspace, Falls Bars</td>
<td>Signs</td>
<td>Ladder Safety, Aerial Lift Training, Cameras In/Out</td>
<td>Hard hats, Safety Glasses, High Vis Jackets, Hard Toe Boots, Face Shield, Respirator where applicable</td>
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<tr>
<td>02</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>2</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>Proper lift techniques, Adequate workspace, Falls Bars</td>
<td>Charts</td>
<td>Ladder Safety, Aerial Lift Training, Cameras In/Out</td>
<td>Hard hats, Safety Glasses, High Vis Jackets, Hard Toe Boots, Face Shield, Respirator where applicable</td>
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</tr>
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</table>
## ORM Tour Log

**Week of: February 1st, 2010**

<table>
<thead>
<tr>
<th>Employee Name</th>
<th>Employee Signature</th>
<th>Date</th>
<th>Response to the Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charles Massoth</td>
<td></td>
<td>2-2/2-2</td>
<td>ICE SPOT! NOTICED SEVERAL AREAS OF ICE. ICE SHOWED IN MANY AREAS, HOMEWORKING</td>
</tr>
<tr>
<td>Raymond Baird</td>
<td></td>
<td>2-3/2-4</td>
<td>Ice on floor! On sand or chemical! Site walk - Trucks equipment equipment few pictures</td>
</tr>
<tr>
<td>Rob Stewart</td>
<td></td>
<td>2-7/2-10</td>
<td>Did not ask question</td>
</tr>
<tr>
<td>John Cochran</td>
<td></td>
<td>2-8/2-7</td>
<td></td>
</tr>
<tr>
<td>Doug Keyser</td>
<td></td>
<td>2-9/2-9</td>
<td></td>
</tr>
<tr>
<td>Ross Mobley</td>
<td></td>
<td>2-10/2-5</td>
<td></td>
</tr>
<tr>
<td>Dave Timberlake</td>
<td></td>
<td>2-10/2-5</td>
<td></td>
</tr>
<tr>
<td>Mike Strange</td>
<td></td>
<td>2-7/2-10</td>
<td>STEEL WORKER/Welder ON LIFT - NOT TIED OFF - ALSO DROPPED CHISEL DOWN RISER</td>
</tr>
<tr>
<td>jip Stoicu</td>
<td></td>
<td>02/05</td>
<td>I WALKED WITH MIKE, SAME RESPONSE.</td>
</tr>
<tr>
<td>Paul Crane</td>
<td></td>
<td>2-8/10</td>
<td>SNOW DEEP Use cardboard.</td>
</tr>
<tr>
<td>Mike Barnhart</td>
<td></td>
<td>2-9/10</td>
<td>Snowing,ussels lift while indicated in ceiling NOT BEING LIFT DOWN THEN MOVING</td>
</tr>
<tr>
<td>Mike Vroom</td>
<td></td>
<td>2-3/10</td>
<td>Ice on upper levels of site. Workers need to be aware of surroundings and be safe.</td>
</tr>
<tr>
<td>Mike Park</td>
<td></td>
<td>2-4/10</td>
<td></td>
</tr>
<tr>
<td>Jesse Cooper</td>
<td></td>
<td>2-7/2-10</td>
<td>Men using fire fighting staff need to Tie off their hoses - Drop instead from upper floors</td>
</tr>
<tr>
<td>Rich Tomkingsen</td>
<td></td>
<td>2-4/10</td>
<td>Untreated ice and snow on floors</td>
</tr>
<tr>
<td>James Gaskins</td>
<td></td>
<td>2-4/10</td>
<td>ICE/SNOW in several areas</td>
</tr>
<tr>
<td>Mike Stroufe</td>
<td></td>
<td>2-4/10</td>
<td>SLIPPIE PRESS WHERE WEP Dye NEADING ON 3D LEVEL</td>
</tr>
</tbody>
</table>
# Weekly Look Ahead

## Administrative Procedures

**Form 5.4**

**M. C. Dean**

**Operational Risk Management Weekly – Four-Week Look-Ahead Form**

<table>
<thead>
<tr>
<th>Safety plan for week ending:</th>
<th>08.23 - 08.28.2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project/Location:</td>
<td>WEST TOWER, WPS / BARC 133, Alexandria, Virginia</td>
</tr>
<tr>
<td>Plan Prepared by:</td>
<td>Mr. Voruc</td>
</tr>
<tr>
<td>Dated:</td>
<td>08.21.2010</td>
</tr>
</tbody>
</table>

**Next four weeks scope of work:**
- Land cable in electric rooms
- Run pipe overhead to 10th floor

**Identified Risks/Exposures/Hazards:**
- Electrocutions
- Dehydration
- Sprain and strain
- Flying objects
- Crush when use scissor lift

**Control Measures:**
- Do not work energized
- Use 2070 procedures
- Stay aware in your area
- Keep work area clean
- Check your equipment
- Wear proper PPE
- Ask same help if you need

**Additional Activity Hazards Analysis or Updates Required:**

**PPE/Safety Equipment Needed:**
- Hard Hats:
- Safety Glasses:
- Safety Vest:
- Hearing Protection:
- Gloves (specify type and size):
- Fall Protection:
- Eye Wash Station:
- First Aid Kit:
- Other:

**Competent Person Changes:**
- No

**Planned Orientation/Training:**
- No

**Recommendations/Comments/Concerns:**
- No

---

First Edition
Issued 12/30/2009
The Rest of the Story..........
Successes To Date

Program Maintenance, Audits, Feedback, Measurements

- Leading and Lagging Indicators
- Weekly ORM Self Audits and CAPA
- Corporate Follow-up Audits and CAPA
- Daily Management/Employee ORM Tours
- Predictive Solutions – 2.2 million Observations
- Six-Sigma Feedback to crews
- Weekly Four-week Look-ahead
- Senior Management and Project Safety Committees
- Stretch and Flex
Performance Monitoring

- Predictive Solutions SafetyNet

Home Page

Overview

- 4 Weeks
- 12 Weeks
- 6 Months
- 12 Months
- YTD

Inspections (Oct 2010 - Sep 2011)

M.C. Dean Inc

- Project - Ft. Belvoir Hospital

Inspections (Oct 2010 - Sep 2011)

- My Charts
  - Total Unsaftes/Insp
  - 3030 Unsafe/Inspection

- My Reports
  - 3030 Project List
    - METRO - Silver Line: 97.3%
    - TX_PREPAB: 98.3%
    - South Campus EUP: 90.5%
    - Arlington Service Center: 98.7%
    - Parkland Hospital: 98.8%

- Add Report

- Quick Links
  - Add a New Project
  - Add a New Company
<table>
<thead>
<tr>
<th>Safe</th>
<th>Unsafe</th>
<th>Operations Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
<td>Participates in implementation of safety, health and ORM efforts</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Actively encourages the ORM process</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Audits project teams for ORM compliance</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Makes tours on a regular basis</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Interviews employees &quot;Actively Caring&quot;</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Seeks out opportunities to praise and reward employees</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Provides resources and support for ORM efforts</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Ensures all incidents are investigated / reported properly</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Ensures subcontractors are compliant with ORM process</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Reviews findings for areas of improvement</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Includes safety / ORM in operational meetings</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Ensure information sharing between projects in consistent</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Reviews safety deficiency log for corrective actions</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Ensures APP is created &amp; maintained as required</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Makes his presence known to craft / line level employees</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Conducts risk assessment on current &amp; upcoming work</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Ensures tours are made on a regular basis</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Reviews ORM assessments for areas of improvement</td>
</tr>
</tbody>
</table>
### Sustaining Site Self Audit

#### ORM Program Assessment

<table>
<thead>
<tr>
<th>Site Name:</th>
<th>Date of Audit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditor:</td>
<td>Date of Audit:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.0 Administration/Training</th>
<th>Input</th>
<th>Comments</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ORM Being Conducted and Documented</td>
<td>Yes</td>
<td>Available in binders at the safety office</td>
<td>100%</td>
</tr>
<tr>
<td>2 Does the project site document ORM training in employees’ training records (paper or electronic)?</td>
<td>Yes</td>
<td>Paper copies available</td>
<td>100%</td>
</tr>
<tr>
<td>3 Records for the ORM process are being maintained</td>
<td>Yes</td>
<td>DWB, PHA, Risk Assessment, Site Orientation, APP</td>
<td>100%</td>
</tr>
<tr>
<td>4 All Employees Attend Orientation</td>
<td>Yes</td>
<td>Site orientation developed and all attended</td>
<td>100%</td>
</tr>
<tr>
<td>5 Superintendent speaks to all employees as part of site orientation</td>
<td>Yes</td>
<td>Florian is present and speaks of the importance of safety</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.0 Activity Hazard Analysis, (AHA) Process</th>
<th>Input</th>
<th>Comments</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AHA are developed for each task</td>
<td>Yes</td>
<td>AHA are part of the DWB</td>
<td>100%</td>
</tr>
<tr>
<td>2 AHA are being reviewed before the start of each new job task by foreman/supervisor with employees. Follow-up reviews will be conducted on a weekly basis as a minimum</td>
<td>Yes</td>
<td>AHA are part of the DWB</td>
<td>100%</td>
</tr>
<tr>
<td>3 AHA is being developed with input from employees</td>
<td>80%</td>
<td>Comments to the AHA will be inputed as they are received</td>
<td>80%</td>
</tr>
<tr>
<td>4 AHA is readily available to all employees</td>
<td></td>
<td>Copies of all AHAs are separated and printed for convenience</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.0 Project Risk Assessment Register</th>
<th>Input</th>
<th>Comments</th>
<th>Score</th>
</tr>
</thead>
</table>
## Monthly Operational Risk Management Report

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Mgmt</th>
<th>Score</th>
<th>Work</th>
<th>ASSESS</th>
<th>ORM Assessment</th>
<th># Observations</th>
<th>Percent at RISK</th>
<th>Job to Date</th>
<th>Job To Date</th>
<th>Job To Date</th>
<th>Job To Date</th>
<th>Job To Date</th>
<th>12-Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Hopkins 073105</td>
<td>90.0%</td>
<td>4.79</td>
<td>1.09</td>
<td>100.0%</td>
<td>&gt;89.5</td>
<td>656</td>
<td>0.80</td>
<td>1.79</td>
<td>16.67</td>
<td>0.89</td>
<td>27.74</td>
<td>0.32</td>
<td>1.09</td>
</tr>
<tr>
<td>Arlington Service 103144</td>
<td>90.0%</td>
<td>3.91</td>
<td>1.12</td>
<td>93.8%</td>
<td>88.4%</td>
<td>3026</td>
<td>1.20</td>
<td>1.43</td>
<td>0.00</td>
<td>1.43</td>
<td>7.34</td>
<td>0.00</td>
<td>1.48</td>
</tr>
<tr>
<td>South Campus 103142</td>
<td>55.0%</td>
<td>N/R</td>
<td>1.34</td>
<td>97.4%</td>
<td>65.4%</td>
<td>3120</td>
<td>1.40</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>North Anna Power 103146</td>
<td>100.0%</td>
<td>6.00</td>
<td>0.78</td>
<td>99.0%</td>
<td>96.5%</td>
<td>648</td>
<td>0.30</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>VCU 09R045</td>
<td>75.0%</td>
<td>4.28</td>
<td>1.64</td>
<td>88.4%</td>
<td>65.4%</td>
<td>651</td>
<td>3.10</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Duke Medical 10R049</td>
<td>71.0%</td>
<td>4.02</td>
<td>0.00</td>
<td>82.2%</td>
<td>79.2%</td>
<td>1954</td>
<td>4.40</td>
<td>0.77</td>
<td>0.00</td>
<td>0.00</td>
<td>43.66</td>
<td>0.12</td>
<td>1.45</td>
</tr>
<tr>
<td>Tim Davis 83011</td>
<td>85.0%</td>
<td>3.07</td>
<td>N/R</td>
<td>95.6%</td>
<td>96.9%</td>
<td>210</td>
<td>0.00</td>
<td>2.83</td>
<td>0.00</td>
<td>2.83</td>
<td>43.64</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Walter Reed TEL 083122 TEL &quot;Walter Reed 083122&quot; Reno</td>
<td>77.0%</td>
<td>N/R</td>
<td>1.18</td>
<td>97.4%</td>
<td>93.9%</td>
<td>583</td>
<td>0.50</td>
<td>1.46</td>
<td>2.44</td>
<td>0.98</td>
<td>15.66</td>
<td>0.01</td>
<td>0.91</td>
</tr>
<tr>
<td>Walter Reed 083118</td>
<td>92.0%</td>
<td>N/R</td>
<td>1.12</td>
<td>97.4%</td>
<td>92.4%</td>
<td>393</td>
<td>0.50</td>
<td>1.85</td>
<td>2.44</td>
<td>0.98</td>
<td>27.76</td>
<td>2.91</td>
<td>0.00</td>
</tr>
<tr>
<td>Parkland Hospital 103130 CON</td>
<td>87.0%</td>
<td>6.00</td>
<td>0.67</td>
<td>91.5%</td>
<td>91.8%</td>
<td>2344</td>
<td>0.90</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>92.68</td>
<td>0.10</td>
<td>0.00</td>
</tr>
<tr>
<td>Ft Hood TEMF 10W002.001</td>
<td>88.0%</td>
<td>2.23</td>
<td>1.85</td>
<td>92.4%</td>
<td>92.2%</td>
<td>210</td>
<td>1.60</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>17.65</td>
<td>0.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Ft Hood-CON (DARNELL)</td>
<td>88.0%</td>
<td>3.31</td>
<td>2.46</td>
<td>92.6%</td>
<td>92.6%</td>
<td>210</td>
<td>1.60</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>17.65</td>
<td>0.11</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### Legend

- **ORM Assessment**:<br>  - **RED**: <69.9<br>  - **VIOLET**: 70-77.9<br>  - **YELLOW**: 78-84.9<br>  - **GREEN**: 85-89.4<br>  - **BLUE**: >89.5<br>  - **SafetyNet At-Risk %**:<br>  - **RED**: >2.41<br>  - **VIOLET**: 2.01-2.4<br>  - **YELLOW**: 1.76-2.0<br>  - **GREEN**: 1.51-1.75<br>  - **BLUE**: 0.01-1.5<br>  - **OSHA Incident Rate**:<br>  - **RED**: >0.76<br>  - **VIOLET**: 0.71-0.75<br>  - **YELLOW**: 0.51-0.70<br>  - **GREEN**: 0.26-0.50<br>  - **BLUE**: 0.0-0.25<br>  - **OSHA LWDR**:<br>  - **RED**: >1.61<br>  - **VIOLET**: 1.16-1.6<br>  - **YELLOW**: 1.01-1.15<br>  - **GREEN**: 0.96-1.00<br>  - **BLUE**: 0.95-1.0
Performance Tracking – Weekly Report

Weekly Safety Performance Dashboard

Project: WHS

Current Week Performance

<table>
<thead>
<tr>
<th>Overall</th>
<th>Inspections</th>
<th>Safe</th>
<th>At-Risk</th>
<th>% At-Risk</th>
<th>SP Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22</td>
<td>1034</td>
<td>21</td>
<td>2.03%</td>
<td></td>
</tr>
</tbody>
</table>

| J. Sours | 4  | 309 | 7  | 2.27% |
| N. Pagnotta | 1  | 31  | 1  | 3.28% |
| R. Rosa | 3  | 111 | 0  | 0.00% |
| J. Wash | 2  | 67  | 0  | 0.00% |
| A. Santos | 1  | 5   | 1  | 20.00% |
| J. Boon | 1  | 31  | 1  | 3.28% |
| J. Farrell | 3  | 111 | 0  | 0.00% |
| D. Mercado | 2  | 138 | 4  | 2.90% |
| J. Stevenson | 1  | 47  | 1  | 2.13% |
| C. Dotson | 2  | 67  | 2  | 2.99% |
| S. Kines | 2  | 57  | 4  | 7.02% |

At-Risk Trending Area

Activity Code

Casual Factor

Week of evaluation: Oct. 25th-30th, 2010

M.C. DEAN
BUILDING INTELLIGENCE

Electrical Industry IR
M.C. Dean Incident Rate
CII

All Employees understanding the safety requirements and the task assignments please sign on the lines below

Jeffrey Mason

Robert Mason

Enter Signatures

I have read and understand the SAFETY INFORMATION items and NHA(s) noted on this Pre-Task Planner and CRRA model. If there are any questions concerning this document or if this document needs to be altered to meet suitable safety requirements for the nee members, I will notify my supervisor immediately. I hereby agree to immediately any unsafe condition that is identified and will also abide by the information listed in this document.

Select Employee

AARON PAUL MCKENZIE
ANTHONY DAVID RICKETS
BRIAN G DENSMORE
JOHN CHARLES MCDOUGALL JR
LANCE EARL SPENCE
Feed Back Loop

Five Core Functions of Operational Risk Management

How can we improve?

Keeping safety in mind at all times. Watch where you step. Be aware of surroundings.
What's Next

Daily Planning for World Class Excellence

- Define the Scope of Work
- Analyze the Hazards
- Develop and Implement Hazard Controls
- Provide Feedback and Continuous Improvement
- Perform Work Within Hazard Controls

ORM

Safety  Quality  Productivity
Recognition of Outstanding Service to

Kimberly Myers

For significant contribution to the development and implementation of the CRM program in safety.

William R. Dean
Founder & CEO

Richard Shef
Vice President
Engineering & Construction

2010