Making Safety Real

Taking Risk Management to the Next Level
Setting The Stage...

It All Comes Back to Culture....
HOW ORGANIZATIONS WORK....

Vision/Values

Principles/Beliefs

Culture

Results

Basis for Decision Making (DNA)

Decisions

Information

Finance

Safety

Production

Measures

Rewards

Communication

Audit

Defines How We Do Things Here
Think Safety First!
Organization Choices...
Designed to Get the Results They Get

Critical Activities
• Risk Assessment Action Implementation
• Permit System Management
• Blinding of Piping Under Maintenance
• Safety Recovery System Integrity
• Training in Emergency Evacuation

Safety Culture
- Lacking a Sense of Vulnerability
- Workplace Safety and Process Safety Not Risk Based
- Production/Cost an Imperative Ahead of Safety
- Transparency and Performance
- Preparedness, roadway evacuation

Piper Alpha....29 years ago
Critical Activities
• Formulation of Cement
• Cement Placement for Well Sealing
• Monitoring of Pressure Readings for Well Seal Confirmation
• Emergency Diversion Protocols
• Blowout Protector Installation and Maintenance

Organization Choices...
Designed to Get the Results They Get

Safety Culture
- Lacking a Sense of Vulnerability
- Workplace Safety and Process Safety not Risk Based
- Production/Cost an Imperative Ahead of Safety
Reflecting Back....

....when you go to the Smithsonian and see Discovery there, think how lucky you are to see her whole, intact, and with her crews safely on the ground....
January 28, 1986, the Shuttle Challenger Explodes
Another Tragedy...
Columbia 2003
Immediate Cause?
- Too cold to launch, “O” – rings failed to keep $O_2$ from $H_2$ mixing before the engine

Basic Causes?
- Management pressure on cost & schedule
- Failure to investigate previous incidents.
- Failure to do a risk assessment.
Columbia - 2003

Immediate Cause?

- Tiles were damaged

Basic Causes?

- Management pressure on cost & schedule
- Failure to investigate actual incidents.
- Failure to do a risk assessment.
What the Organization Did Not Do........

Key Organizational Culture Findings

1. Maintain Sense Of Vulnerability
2. Combat Normalization Of Deviance
3. Establish an Imperative for Safety
4. Perform Valid/Timely Hazard/Risk Assessments
5. Ensure Open and Frank Communications
6. Learn and Advance the Culture
Making Connections....

- Culture not Advanced, Failure to Learn
- Safety Not An Imperative
- Lack of Open Communication
- Failure to Risk Assess
- Normalization of Deviance
- Lacking a Sense of Vulnerability

1. Maintain Sense Of Vulnerability
2. Combat Normalization Of Deviance
3. Establish an Imperative for Safety
4. Perform Valid/Timely Hazard/Risk Assessments
5. Ensure Open and Frank Communications
6. Learn and Advance the Culture
Making Connections....

Management System Failure

- Risk Level not Known to those Affected and/or Leading
- Lack of Open Communication
- Safety Not An Imperative
- Culture not Advanced, Failure to Learn

- Normalization of Deviance
  - Failure to Risk Assess

- Lacking a Sense of Vulnerability
Making Connections….

Management System Failure

Culture not Advanced, Failure to Learn
Organization Choices...
Effectively Learning from Incidents

Incidents Are... 

Don’t Wait for the Worst to Happen!

...But the Biggest Tragedy Would Be Not to Learn From Them
BREAKING the INCIDENT CHAIN
Serious Industrial Incident
Serious Industrial Incident

Human Factor
Serious Industrial Incident

Vice President
Latent Causes – Define Culture

“Organizations are Designed to Get the Results They Get”. 
evaluation of 873 high-consequence incidents at 34 companies over a 12-month period

found that most investigations were fair in terms of quality

most companies took at least one corrective action for high-consequence incidents, but few of these corrective actions were confirmed as having been completed

most corrective actions were secondary interim administrative controls (e.g., having a safety meeting) rather than fair or strong controls (e.g., training, engineering elimination)
Fatalities and Serious Incidents are Persisting in Industry

The System View

Expenditure of a Finite Effort to Achieve an Optimized Level of Risk Management

Process Safety Management Elements

1. Accountability: Objectives and Goals
2. Process Knowledge and Documentation
3. Capital Project Review and Design
4. Process Risk Management
5. Management of Change
6. Process and Equipment Integrity
7. Human Factors
8. Training and Performance
9. Incident Investigation
10. Company Standards, Codes and Regulations
11. Audits and Corrective Actions
12. Enhancement of Process Safety Knowledge
Risk Management Effectiveness....

Optimizing Effort and Risk Benefit
CAUTION

ALSO, THE BRIDGE IS OUT AHEAD

DO NOT TOUCH THE EDGES OF THIS SIGN

ALSO, THE BRIDGE IS OUT AHEAD
Breaking the Incident Chain

Expenditure of a Finite Effort to Achieve an Optimized Level of Risk Management
Risk Management Effectiveness....

Finite Resource Level

Risk Level

Effort Expended
Auditing for Performance....

Scored Activities

Curve “A”  Curve “B”
Major Tailings Facility Impoundment Failure

- Dyke Erosion (Surveillance Issue)
- Freeboard Insufficient (Water Balance Issue)
- Design Nonconformance
Risk Ranking....
Not All System Requirements are Equal

Scored Activities
0 5 10

Critical Activities
0 5 10

Curve “A”

Critical Activities
0 5 10

Curve “B”
The System View

Safety as a Value
Life Saving Rules
Triggers
Critical Procedures

Risk Ranking....
Not All System Requirements are Equal

Reference Procedures
General/Trade/Operator Practices
Qualification Training
Facility/Task Training
General Safety Training
Risk Management Effectiveness....

![Graph showing risk level versus effort expended, with a finite resource level indicated.](image-url)
# Fatality Risk Management Process

## Assurance
- Review
- Audit
- Verify
- Monitor

## Governance
- CEO
- COO
- RSVPs
- GMs

## Policy
- Fatality Risk Standards
- Critical Control Management
- Procedures, permits, plans and instructions

## 16 Global Fatality Risks

<table>
<thead>
<tr>
<th>Category</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event in confined space</td>
<td>Vehicle/pedestrian interaction – underground</td>
</tr>
<tr>
<td>Contact with electricity</td>
<td>Vehicle/pedestrian interaction – surface</td>
</tr>
<tr>
<td>Fall from height</td>
<td>Vehicle interaction – offsite</td>
</tr>
<tr>
<td>Uncontrolled release of energy</td>
<td>Vehicle collision (heavy and light) – surface</td>
</tr>
<tr>
<td>Fall of ground – surface</td>
<td>Heavy Vehicle event – rollover, over edge</td>
</tr>
<tr>
<td>Uncontrolled load during lifting</td>
<td>Entanglement in rotating equipment</td>
</tr>
<tr>
<td>Fall of ground – underground</td>
<td>Underground fire and explosion</td>
</tr>
<tr>
<td>Uncontrolled load during lifting</td>
<td>Incident during tire handling</td>
</tr>
<tr>
<td>Uncontrolled load during lifting</td>
<td>Struck by falling object</td>
</tr>
</tbody>
</table>

**Critical Controls Identified for Action**
Societal Demands => Economic
Societal Demands => Environment
Societal Demands => Community

Values

Societal Perception...Values
Societal Perception…Values

Societal Demands

Values

- Economic
- Environment
- Community
- Safety/Risk
Industry LEADERSHIP
risk management
The Journey......