Implementation of PSM in Diverse Cultures

Charles A. Soczek
Harry J. Glidden
DuPont Safety Resources
Agenda

- Recent PSM Incidents
- DuPont PSM Implementation Model
- Hofstede Business Cultural Dimensions
- Examples of Cultural Challenges and Lessons Learned
Petroleum and Chemical Industries report best performance

Injuries & Illnesses – Cases With Days Away From Work Rate per 100 Employees*

** DuPont 2007 Data

Copyright © 2008 DuPont. All rights reserved. The DuPont Oval Logo, DuPont™, and The miracles of science™ are registered trademarks or trademarks of DuPont or its affiliates.
But catastrophic incidents continue to occur.....

1985: Piper Alpha Platform (Occidental)
167 killed
Cost: US$1.2 billion

1984: Union Carbide Bhopal, India (toxic release)
>2000 fatalities

1989: Phillips Chemical Texas (release and explosion)
24 fatalities

1995: Nigerian Oil Rig Explosion (Mobil)
13 fatalities, 25 injured.

2001: P36 Sinking Platform (Petrobras)
11 fatalities
Cost: US$515 million

2004: Formosa Plastics
Illinois (VC release and explosion)
5 fatalities

2005: Texas City Refinery (BP)
15 fatalities, 170 injured
Cost: US$3 billion+

2006: Pipeline Explosion (Nigerian National Petroleum Corporation)
200 fatalities

2007: Valero McKee, TX Refinery
0 fatalities, 15 injured
Cost: US$376 million

2007: Saudi Aramco Near Hawiyah, Saudi Arabia (gas explosion)
28 fatalities

2008: Imperial Sugar Georgia (dust explosion)
8 fatalities

2009: ConocoPhillips Texas City (dust explosion)
15 fatalities

2010: Chevron Richmond, CA Refinery (dust explosion)
15 fatalities

Globalization of DuPont

- 1990s – significant globalization of DuPont
- Process Safety Management Standard applied to all high hazard operations, worldwide
- Sites are responsible for local regulations
- Corporate standards, as OSHA regulations, are performance based standards
- Faced cultural challenges in implementing PSM
Management and Elements of PSM
The DuPont Implementation Model

- **Assess**
- **Envision**
- **Plan**
- **Implement**

**Company Management System**

**DuPont Management Process and Technology**

**Sustainable Improvement of Management Systems**

**ORGANIZATION**

**PROCESS**

**PEOPLE**

**TECHNOLOGY**

Business Case for Change
CCPS – Implementation of Process Safety Management

- Some key elements
  - Preparation, planning, and communications
  - Implementation framework
  - Specific attributes workshop
  - Site PSM leadership teams
  - PSM element teams
  - PSM implementation plan
  - Putting the system in place
  - Full element implementation plan
Geert Hofstede Business Culture Dimensions

- Studied business culture in 66 countries
- Used five dimensions to describe culture
  - Power distance index
  - Individualism
  - Masculinity
  - Uncertainty avoidance
  - Long term orientation
## Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Distance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertainty</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Impact of Culture on PSM Implementation

- PSM Networks
- PSM Standards and Operating Discipline
- Technology
PSM Networks

- **DuPont makes extensive use of PSM networks**
  - Formal and informal
  - Permanent and temporary

- **Examples of Network activities**
  - Update corporate standards
  - Keep abreast of new technologies
  - Develop and implement training programs
PSM Networks

● Examples of Networks
  ➢ PSM
  ➢ PHA
  ➢ Process Technology
  ➢ Mechanical Integrity/Quality Assurance

● Why network
  ➢ Leveraging of specialized skills
  ➢ Very cost effective
PSM Networks

- Network Teams
  - Individuals from site, business, and corporate line organizations and staff functions
  - Work for their parent organization and the network
  - Are critical to the PSM process in DuPont
  - Networks are Global, and participation is expected within the company culture
## Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
PSM Networks

• In the developing nations, we have found it is difficult for networks to be effective
  - Managers have difficulty allowing their direct reports to do work not directly for them (High Power distance coupled with low individuality)
  - Direct reports have difficulty in accepting direction from someone other than their manager

• In many countries, there is less economic incentive to leverage people for cost effectiveness
Impact of Culture on PSM Implementation

- PSM Networks
- **PSM Standards and Operating Discipline**
- Technology
PSM Standards and Operating Discipline

- PSM governance
  - Policies and standards
  - Implement with strong operating discipline
  - Audit to assure compliance
### Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
PSM Standards and Operating Discipline in the US (DuPont Included)

- Cultural resistance to rules, and following rules that are in place (low power distance and low uncertainty avoidance)
- Overcoming this resistance
  - Develop site specific “PSM How”
  - Implement a robust Operating Discipline program
  - Implement Observations and Audit processes
## Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
PSM Standards and Operating Discipline in the Arab Lands, Brazil, and Mexico

- Expect to have standards in place
- Expect conformance to the standards
## Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
PSM Standards and Operating Discipline in China and India

- Expect standards in place (high power distance)
- But implementation may be poor and inconsistent (low uncertainty avoidance)
## Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
PSM Standards and Operating Discipline in the Arab Lands using India Human Resources

- Conflict??? (high power distance and high uncertainty avoidance versus high power distance and low uncertainty avoidance)
- The country sets the standards, and if they are not followed, people are sent home
Impact of Culture on PSM Implementation

- PSM Networks
- PSM Standards and Operating Discipline
- Technology
DuPont PSM Model
Implementation of PSM Elements in China and India

- Engineers are
  - trained
  - skilled
  - highly motivated
  - understand technical aspects of PSM
## Sample Hofstede Ratings

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Arab Lands</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Individualism</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
Implementation of PSM Elements in China and India

- Engineers look to management for
  - Direction, Priority Setting, Resources

- Management reviews and sign-off at surprisingly high levels
  - Can lead to poor implementation of PSM elements such as management of change

- Willingness to accept uncertainty can lead to problems with operating discipline
Implementation of PSM Globally

- Cultural issues are real, and must be recognized
- Changing culture is a difficult, long process
- All cultures face implementation challenges, including the US
- Leadership must understand themselves and their organization’s cultural challenges to implement PSM, and put systems and processes in place that work within the culture