California State Lands Commission

Mineral Resources Management Division

Safety Audit Program
Oct 20, 2010
Summary of Oil & Gas Operations Statistics

- **Over the past 10 years:**
  - 168 million barrels of oil (7 billion gallons) have been produced in California
  - $2.4 Billion in State revenue

- **Offshore oil spills:**
  (in state waters from oil & gas drilling & production ops)
  - generally measured in drops or ounces
  - less than 12 per year,
  - Average volume less than half a barrel (+/- 21 gallons) each year
California Offshore Safety

- 1960’s – State Platforms installed
- 1969 Blowout – Platform A
- Resulted in:
  - New regulations
  - Inspection program
  - Contingency Plans/Drills
Prescriptive Safety Regulations

1969 Blowout
New Regulations
Monitor / Inspect for compliance

Improving Safety

Early 1900’s 1950’s-60’s 1970’s-80’s
Inspection Program History

- **Existing Leasing regulations (1938-1970’s)**
- **1980 – Regulation Update**
  - Integrated Shutdown System & API design criteria
  - Revised Drilling Regs
  - Annual Pipeline Inspection
Prescriptive Requirements

1980 Regulation Update
- Integrated Shutdown System / API design criteria
- Revised Drilling Regs
- Annual Pipeline Inspection

Accidents & Incidents rate

Inspection

Reckless

Reactive

Compliance, Rule Book Based

Updated Regulations

Improvement in Safety
Production Regulations - History

- 1960’s – State Platforms installed
- 1969 Blowout – Platform A - New regulations
  - Inspection program requirements
  - Contingency Plans/Drills
- 1980 – Updated regulations
  - Integrated Shutdown System & API design criteria
  - Revised Drilling Regs
  - Annual Pipeline Inspection
- 1986 – Safety Design Analysis Developed
  - An early Safety Audit Program
  - RP 14C Design Standard Analysis
Inspections Evolve

Prescribed equipment
- Witness testing of safety systems and devices
- Check/count/verify

Performance elements
- Monitor/Observe Operations
- Spill Surveillance

Improvement in Safety

Accidents & Incidents rate

Reckless
Reactive
Compliance, Rule Book Based
Early Design Audit
Updated Regulations
Production Regulations
Platform Inspection Program

- **Monthly Testing & Inspection — 2-3 days**
  - Production systems (safety valves, pressure/level indicators)
  - Safety systems (alarms & shutdowns)
  - Fire Fighting, Life Saving, Cathodic Protection (pipelines)
  - Test an average of 317 devices
  - Deficiencies are corrected immediately or equipment is OOS

- **Inventory on-site spill response equipment**

- **Daily Inspections**
  - Pipeline route, pollution checks, royalty production verification
Production Regulations - History

- 1960’s – State Platforms installed
- 1969 Blowout – Platform A - New regulations
- 1980 – Updated regulations
- 1986 – Safety Design Analysis Developed

- 1990 – Lempert Keene Seastrand Act (SB 2040)
  - After Exxon Valdez and American Trader Spills
  - Added Inspections for Marine Facilities & BAP Requirement
  - Realignment of Spill Drill and Contingency Plan Responsibilities

- 1999 - Augmented Safety Audit Program
  - Design and integrated safety system improvements
  - Operations Manuals
  - Maintenance requirements of aging platforms
Complementary Programs

- Existing Inspection Program
- Safety Audit Program

Accidents & Incidents rate vs. Improvement in Safety

- Reckless
- Reactive
- Compliance, Rule Book Based
- Updated Regulations
Safety Audit – Team Approach

Teams

- Equipment Functionality & Integrity
- Electrical
- Technical
- Administrative

- Organizational Safety / Human Factors - Safety Assessment of Management Systems (SAMS)
# Safety Audit Results

## 1st Round Audits

**1999 - 2005**

<table>
<thead>
<tr>
<th>Audit Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platforms</td>
<td>13</td>
<td>92</td>
<td>612</td>
<td>717</td>
</tr>
<tr>
<td>Islands &amp; Onshore</td>
<td>62</td>
<td>170</td>
<td>1033</td>
<td>1265</td>
</tr>
</tbody>
</table>

| Total            | 75| 262| 1645| 1982  |

## 2nd Round Audits

**2006 - 2010**

<table>
<thead>
<tr>
<th>Audit Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platforms</td>
<td>2</td>
<td>32</td>
<td>484</td>
<td>518</td>
</tr>
<tr>
<td>Islands &amp; Onshore</td>
<td>13</td>
<td>53</td>
<td>451</td>
<td>517</td>
</tr>
</tbody>
</table>

| Total            | 15| 85| 935| 1035  |

- **Platforms**: 100% on schedule
- **Islands & Onshore**: 99% on schedule
Safety Assessment of Management Systems (SAMS)

- Confidential interviews
- Cross section of company personnel & contractors
- Tool to evaluate use of SEMP type management systems
  - Implementation of SEMP elements
  - “Safety Culture” observed in action
  - Learn of Company fine tuning to achieve more success
    - Behavioral Based Safety (BBS) Programs
- Confidential Report for the company
  - No Action Item requirements
Evolution of Select SMS Guidelines & Regulations

Onshore Process Safety (USA)
- 1987 - CCPS
- 1990 - API RP 750
- 1992 - PSM
- 1996 - RMP

Offshore Safety Management Systems (USA)
- 1990 - PSSDS
- 1991 - SEMP Concept
- 1993 - API RP 75
- 2004 - API RP 75
- 2006 - SEMS Concept
- 2009 - SEMS Prop. Rule

Offshore Safety Management Systems (UK)
- 1992 - UK Safety Case
- 2005 - UK SC Update
- 2009 - MODU HSE Case

Slide from: Steve Maher, RMPCorp.com, Offshore Facility Process Safety Systems Overview Webinar
SEMP/SEMS Element Identification

- Safety & Environmental Information
- Hazard Analysis
- Management of Change
- Operating Procedures
- Safe Work Practices
- Training
- Mechanical Integrity
- Pre-Startup Review
- Emergency Response & Control
- Investigation of Incidents
- Audit of SEMP Elements
- Records & Documentation

Slide from: Steve Maher, RMPCorp.com, Offshore Facility Process Safety Systems Overview Webinar
California State Lands Commission—Mineral Resources Management

Facilities & Equipment
- work space
- design
- maintenance
- physical characteristics
- reliability

People
- human characteristics & behavior
  (physical and mental)
- fitness
- stress
- fatigue

Management Systems
- management commitment
- incident investigation
- hazard identification
- risk assessment
- procedure
- training
Links

◆ **Full report to Commission 20 Aug 2010:**
  http://www.slc.ca.gov/Meeting_Summaries/08-20-10/ITEMS_AND_EXHIBITS/50.pdf

◆ **Our divisions homepage:**

◆ **Our regulations are also there:**
  http://www.slc.ca.gov/Regulations/Chapter_3.html