Annual Performance Report

2019 Reporting Year

Thursday, September 24, 10:00am (CST)
Webinar Agenda

Opening Remarks
Russell Holmes, Center for Offshore Safety

Safety Performance Indicators
Bridget Todd, Baker Hughes

Learning from Incidents and Events
Christy Lafferty, Oceaneering

SEMS Audit Results
Ajay Shah, Chevron

Correlations and Observations
Brad Smolen, BP

Questions & Answers
Julia FitzGerald, Center for Offshore Safety
Welcome / Brief History
Russell Holmes, COS
4 Pillars of COS

- SEMS Audits and Certificates
- Good Practice Development
- Data Collection, Analysis and Reporting
- Sharing Industry Knowledge
COS APR for the 2019 Reporting Year

- Seventh annual report
- COS Member Data Participation
  - 100% Operators
  - 88% Contractors
  - 44+ Million Work Hours

- Key Findings
  - 2 Incidents involving fatalities
  - 0 Level 1 or Level 2 Well Control Incidents
  - Uptick in Mechanical Lifting Incidents
  - 4 SEMS Elements account for majority of Non-Conformances and Areas for Concern reported to BSEE from 2017-2019
COS Safety Shares

- 10 new Safety Shares
- Based on LFI reports
- Available at www.centerforoffshoresafety.org
Safety Performance Indicators
Bridget Todd, Baker Hughes
Work Hours (Normalization Factor)

Work Hours (Millions) by Operation Type

Work Hours by Company

- Wells: 17%
- Production: 18%
- Construction: 13%
- A: 4%
- B: 1%
- C: 6%
- D: 4%
- E: 1%
- F: 8%
- G: 17%
- H: 18%
- I: 28%
- J: 1%
SPI 1 is the frequency of incidents that resulted in one or more of the following:
- Fatality
- Five or more injuries in a single incident
- Tier 1 process safety event
- Level 1 Well Control Incident - Loss of well control
- > $1 million direct cost from damage to or loss of facility, vessel and/or equipment
- Oil spill to water > 10,000 gallons (238 barrels)

SPI 2 is the frequency of incidents that do not meet the SPI 1 definition but have resulted in one or more of the following:
- Tier 2 process safety event
- Collision resulting in property or equipment damage > $25,000
- Mechanical Lifting or Lowering Incident
- Loss of station keeping resulting in a drive off or drift off
- Life boat, life raft, rescue boat event
- Level 2 Well Control Incident - Multiple Barrier Systems Failures and Challenges
SPI 1

- 1A – 2 Incidents involving 1 or more fatalities
- 1B – 0 Incidents with Injuries to 5 or More
- 1C – 2 Tier 1 Process Safety Events (PSE)
- 1D – 0 Level 1 Well Control Incidents
- 1E – 0 Incidents resulting in damage ≥ $1MIL
- 1F – 0 Oil Spills to water ≥ 238 bbl
SPI 2

- 2A – 7 Tier 2 PSE
- 2B – 1 Collision Damage ≥ $25,000
- 2C – 23 Mechanical Lifting Incidents
- 2D – 0 Loss of Station Keeping
- 2E – 2 Life Boat, Life Raft, Rescue Boat Incidents
- 2F – 0 Level 2 Well Control Incidents
SPI 3 is the number of SPI 1 and SPI 2 incidents that involved failure of one or more pieces of equipment as a contributing factor.

- 37 SPI 1 and SPI 2 Incidents Reported
- 9 (24%) of those 37 cited failure of equipment as a contributing factor
- 5 (56%) of those 9 involved Mechanical Lifting Equipment / Personnel Transport Systems
SPI 4

SPI 4 is a crane or personnel/material handling operations incident.

- Highest frequency of SPI 4 reported from 2015-2019
- 137 SPI 4 reported for 2019
  - 38 for 2018; 53 for 2017
  - 102 (74%) of incidents reported were from 2 Operators
SPI 5

SPI 5 is the percentage of planned critical maintenance, inspection and testing (MIT) completed on time. Planned critical MIT deferred with a formal risk assessment and appropriate level of approval is not considered overdue.

- Combined Operator and Contractor avg for 2019 – 94.9%
- Slightly down from 2018 combined avg – 96.7%
SPI 6-9

SPI 6 is number of work-related fatalities
SPI 7 is the frequency of days away from work, restricted work, and job-transfer injuries and illnesses (DART)
SPI 8 is the frequency of recordable injuries and illnesses (RIIF)
SPI 9 is the frequency of oil spills to water ≥ 1 barrel

DART and RIIF

Oil Spill to Water ≥ 1 bbls

2015 2016 2017 2018 2019

DART and RIIF

2015 2016 2017 2018 2019

Oil Spill to Water ≥ 1 bbls

2015 2016 2017 2018 2019

Inside 500 m Zone  Outside 500 m Zone
SPI 10

SPI 10 is the severity *potential* of incidents involving a dropped object

- NEW for 2019 APR
- Based on definitions developed by the DROPSOnline network
- 266 Dropped Objects reported
  - 98 Slight injury potential
  - 98 Minor injury potential
  - 38 Major injury potential
  - 32 Fatal injury potential
COS SAFETY SHARE

WHAT WILL WE DO TO PREVENT THIS FROM HAPPENING HERE?

STORED 2,500 Lb ELEVATOR LINKS DESCEND 69” TO DECK

What happened?
A worker was attaching a rigging rope to a wash sub stored on a horizontal storage rack in the pipe rack area. While the worker was attaching the line, the 2,500 lb elevator links were above the wash sub shifted, and one end of the links descended to the deck. The worker was within 4 inches of the elevator links but was able to avoid being hit by any injuries. The elevator links weigh 2,500 lbs each and fell into the deck calculator potential outcome was fatality.

What went wrong?
The 2,500 lb elevator links were stored in the rack with eyes resting vertical on the horizontal members. The rack was too wide for the 19’ length of the elevator links. The rack used in this event is intended for storage of 22’ length elevator links. Tipping pipe operations on the rig did not allow storage to the area.

Why did it happen?
There was no procedure, markings, or otherwise formally set requirements detailing proper storage arrangements. A lack of formal guidance, improper identification, and use of improper storage arrangements for the elevator links resulted in these placing equipment in areas of opportunity and normalization of risk. The storage rack is not well-recessed area but precautions did not mitigate unsafe conditions.

What areas were identified for improvement?

- Develop specific storage arrangement for elevator links that are appropriate for length and weight that prevent buckling, becoming unstable, and falling. Survey or other similar equipment that may pose a risk.
- Ensure that proper and established approved designated storage arrangements, storage racks, shelving, etc., with the potential to be loaded beyond capacity should be labeled with the rack working limits to prevent overloading.

COS Safety Share

STORED 2,500 Lb ELEVATOR LINKS DESCEND 69” TO DECK
Learning from Incidents & Events
Christy Lafferty, Oceaneering
Learning from Incidents & Events (LFI) – U.S. OCS

• SPI 1 & SPI 2 Incidents
• High Value Learning Events (HVLE)
  • HVLE is an event that may be considered by a COS member or the industry for use as a reference in process hazard analyses, management of change, project design, risk assessment, inspection, operating procedures review and/or training.

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<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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<td>COS SPI 1</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<td>21</td>
<td>17</td>
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<td>19</td>
<td>21</td>
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<td>47</td>
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Areas for Improvement (AFI)

Physical Facility, Equipment, and Process

- Process or Equipment Design or Layout
- Process or Equipment Material Specification, Fabrication and Construction
- Process or Equipment Reliability
- Instrument, Analyzer and Controls Reliability

Administrative Processes

- Risk Assessment and Management
- Operating Procedures or Safe Work Practices
- Management of Change
- Work Direction or Management
- Emergency Response

People

- Personnel Skills or Knowledge
- Quality of Task Planning and Preparation
- Individual or Group Decision Making
- Quality of Task Execution
- Quality of Hazard Mitigation
- Communication
2019 Areas for Improvement – U.S. OCS

- Process or Equipment Design or Layout
- Process or Equipment Material Specification, Fabrication and Construction
- Process or Equipment Reliability
- Instrument, Analyzer and Controls Reliability
- Risk Assessment and Management
- Operating Procedures or Safe Work Practices
- Management of Change
- Work Direction or Management
- Emergency Response
- Personnel Skills or Knowledge
- Quality of Task Execution
- Quality of Hazard Mitigation
- Quality of Task Planning and Preparation
- Individual or Group Decision-Making
- Communication
AFI - Physical Facility, Equipment and Process
U.S. OCS 2015-2019

Areas for Improvement - Facility/Equipment

- Process or Equipment Design or Layout
- Process or Equip Material Spec, Fab and Construction
- Process or Equipment Reliability
- Instrument, Analyzer and Controls Reliability

2015 2016 2017 2018 2019
AFI - Administrative Processes
U.S. OCS 2015-2019

Areas for Improvement - Administrative Processes

- Risk Assessment and Management
- Operating Procedures or Safe Work Practices
- Management of Change
- Work Direction or Management
- Emergency Response

2015 2016 2017 2018 2019
AFI - People
U.S. OCS 2015-2019

Areas for Improvement - People

- Personnel Skills or Knowledge
- Quality of Task Planning and Preparation
- Individual or Group Decision-Making
- Quality of Task Execution
- Quality of Hazard Mitigation
- Communication

2015 2016 2017 2018 2019

0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0%
LFI Reports by Site Type

U.S. OCS 2015-2019

LFI Incident and HVLE Site Type Distribution

- Mobile Offshore Drilling Unit
- Floating Production Facility
- Fixed Production Facility
- Offshore Supply or Support Vessel
- Drilling Rig on Production Facility
- Other - Specify in Step 11 Comments

LFI Reports by Operation Type

U.S. OCS 2015-2019

LFI Incident and HVLE Operation Type Distribution

- Aviation
- Decommissioning
- Wells - Exploration, Appraisal/Production Drilling, Wireline, Completion, Workover, Abandonment, Intervention Activities
- Production - Petro/Nat Gas Prod Flow Lines, Pipe Lines
- Projects - Includes Offshore Construction Activities
- Marine - Diving, Seismic, Transportation, Rig Moves, etc.
- Other - Specify in Step 11 Comments

Christy Lafferty
LFI Reports by Activity Type

U.S. OCS 2015-2019

LFI Incident and HVLE Activity Type Distribution
COS Safety Share

What will we do to prevent this from happening here?

LIFTING EYE UNEXPECTEDLY CAME FREE

What happened?

While rigging a central pipe joint using the well bay crane, the lifting eye assembly unexpectedly came free from the pipe clamp and unsecured its weight. The pipe clamp was located approximately 100 feet away from the crane, which was parked on the platform.

What went wrong?

- The lifting eye failed unexpectedly, causing the lifting eye to swing free and fall onto the well deck.
- The lifting eye assembly was not properly secured to the pipe clamp.
- The lifting eye assembly was not secured to the crane.
- The lifting eye assembly was not properly secured to the lifting gear.
- The lifting eye assembly was not properly secured to the crane.

Why did it happen?

- The lifting eye assembly was not properly secured to the pipe clamp.
- The lifting eye assembly was not properly secured to the crane.
- The lifting eye assembly was not properly secured to the lifting gear.
- The lifting eye assembly was not properly secured to the crane.

What areas were identified for improvement?

- The lifting eye assembly was not properly secured to the pipe clamp.
- The lifting eye assembly was not properly secured to the crane.
- The lifting eye assembly was not properly secured to the lifting gear.
- The lifting eye assembly was not properly secured to the crane.

COS Safety Share

LIFTING EYE UNEXPECTEDLY CAME FREE

COS Safety Share

LIFTING EYE UNEXPECTEDLY CAME FREE
SEMS Audit Data
Ajay Shah, Chevron
Deficiencies by SEMS Element

Deficiencies by SEMS Element

Non-Conformance
Area of Concern

General
Hazard Analysis
Management of Change
Operating Procedures
Safe Work Practices
Training
Mechanical Integrity
Pre-Startup Review
Emergency Response & Control
Investigation of Incidents
Auditing
Recordkeeping & Documentation
Stop Work Authority
Ultimate Work Authority
Employee Participation Program
Reporting of Unsafe Working...
SEMS Audit Findings by SEMS Maturity Phase

Establish
*Do you say what you do?*

Implement – pt 1
*Do you do what you say?*

Implement – pt 2 (Document)
*Do you document what you do, update documents appropriately, and provide access to the right people?*

Maintain
*Do you confirm you SEMS is working as designed and review and act when you say you will?*

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AJAY SHAH
Deficiencies by SEMS Maturity Phase per SEMS Element
HELICOPTER OPERATIONS - ROTOR WASH HAZARD

What happened?

A helicopter insertion operation in a support vessel was mishandled outside of the COS safety zone. A rotor wash from a helicopter caused damage to a support vessel, resulting in a 65 ft. to 68 ft. injury to the person on the support vessel. No personnel safety or equipment safety was involved during this other than walk.

What went wrong?
The area that was affected by the rotor wash was not adequately secured.

Why did it happen?
The investigation identified multiple opportunities for the organisation to learn from past internal and external similar events. COSs reported no assessments, no reviews, deep dive etc. Neither Operator, drill support vessel Contractor, or the aircraft Operator identified this incident as a significant hazard.

What areas were identified for improvement?
The immediate expectation for helicopter operations needs to be specific and sufficient to cover the myriad of facts from a process

Based on the initial investigation, the following areas should be considered:

- Aviation: Helicopters are predominantly focused on internal issues, and the level of attention to rotor wash hazards has been inconsistent in formal risk assessment.
- Multiple incidents highlight missed opportunities to learn from previous internal and external issues, and improving human interface practices.
Correlations & Observations
Brad Smolen, BP
DART and RIIF

Year 2015 2016 2017 2018 2019
DART 0.215 0.214 0.268 0.244
RIIF 0.168 0.279 0.316 0.488 0.448
RIIF

* Agriculture

* Transportation

* Manufacturing
  * Construction

* Mining

- 2015
- 2016
- 2017
- 2018
- 2019
SPI 1 Incident Frequency per Sub-Group

- Tier 1 PSE
- Level 1 WCI

- 0.01 Avg

SPI 2 Incident Frequency per Sub-Group

- Tier 2 PSE
- Level 2 WCI

- 0.058 Avg

Legend:
- 2015
- 2016
- 2017
- 2018
- 2019

* IOGP
SEMS Audit Findings by SEMS Maturity Phase

- **Establish**
  - *Do you say what you do?*

- **Implement – pt 1**
  - *Do you do what you say?*

- **Implement – pt 2 (Document)**
  - *Do you document what you do, update documents appropriately, and provide access to the right people?*

- **Maintain**
  - *Do you confirm you SEMS is working as designed and review and act when you say you will?*
Deficiencies by SEMS Maturity Phase per SEMS Element

Areas for Improvement Distribution

Brad Smolen

2019  2018  2017
Deficiencies by SEMS Maturity Phase per SEMS Element

Areas for Improvement Distribution

2019 • 2018 • 2017
Deficiencies by SEMS Maturity Phase per SEMS Element

Areas for Improvement Distribution

2019  2018  2017
Leaning Forward

- Safety Culture
- Developing and Managing Procedures
- Leadership Site Engagements
- API RP 75 4th Edition
- Process Safety Fundamentals - Verifying Existing Barriers
- Achieving SEMS Maturity
- Mechanical Lifting Good Practices
Join Us!

COS Annual Forum
November 10-12
Registration Information:  www.centerforoffshoresafety.org

- Spotlights on Excellence – finalists for the 2020 COS Safety Leadership Award
- Conversations with BSEE and USCG
- API RP 75 4th Edition
- Process Safety
- Breakout sessions
  - SEMS Maturity
  - Mechanical Lifting
  - Life Boats
  - COVID

Russell Holmes