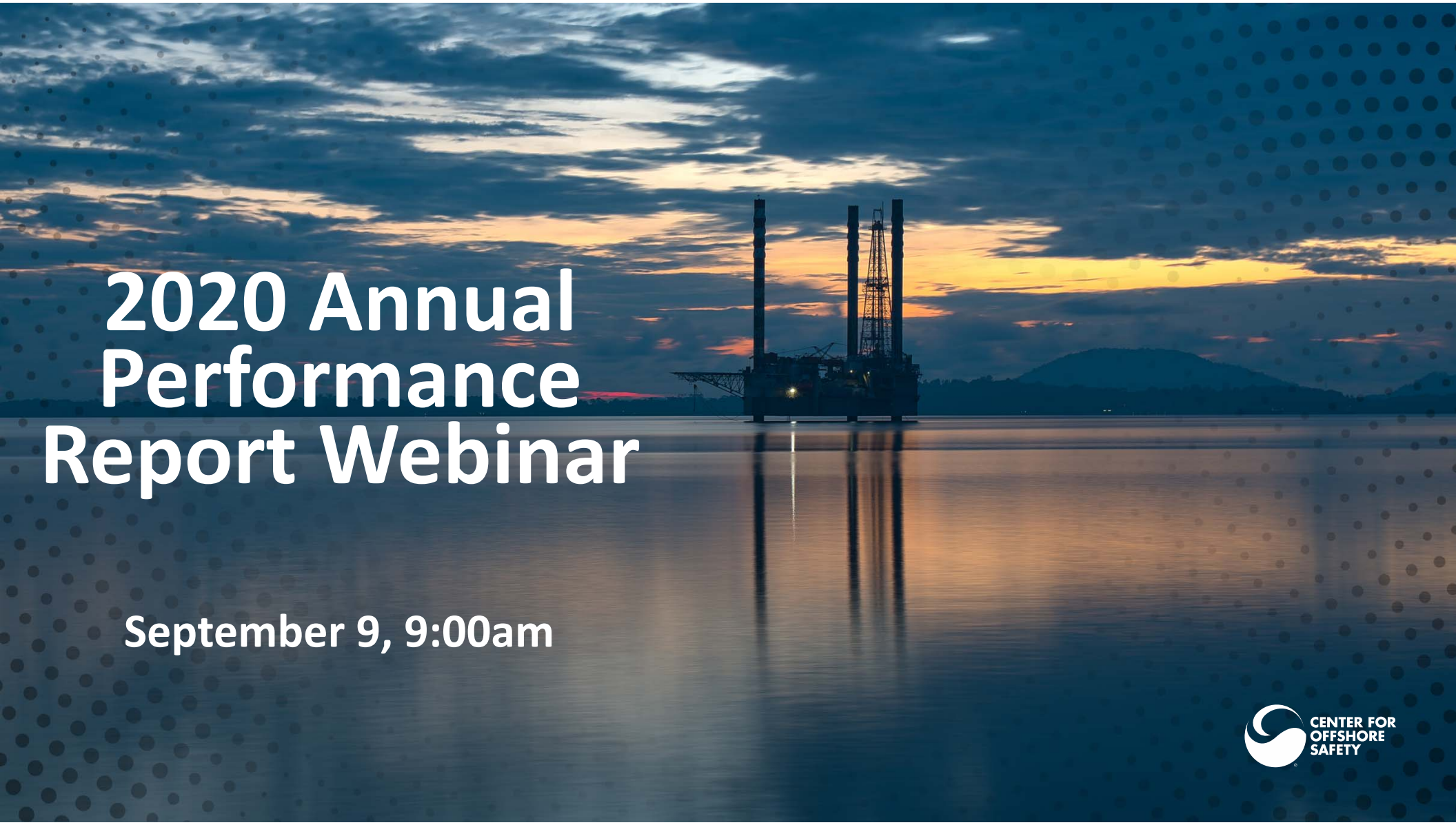


2020 Annual Performance Report Webinar

September 9, 9:00am

CENTER FOR OFFSHORE SAFETY


No discussion or agreements, either explicit or implicit, regarding prices of particular products, services, or commodities nor of individual company scenarios, business plans, purchasing plans, or pricing.
ANTITRUST

Presenters:

- Russell Holmes, COS
- Christy Lafferty, Oceaneering
- Lindsay Magdaleno, OXY
- Bridget Todd, Baker Hughes

CENTER FOR OFFSHORE SAFETY

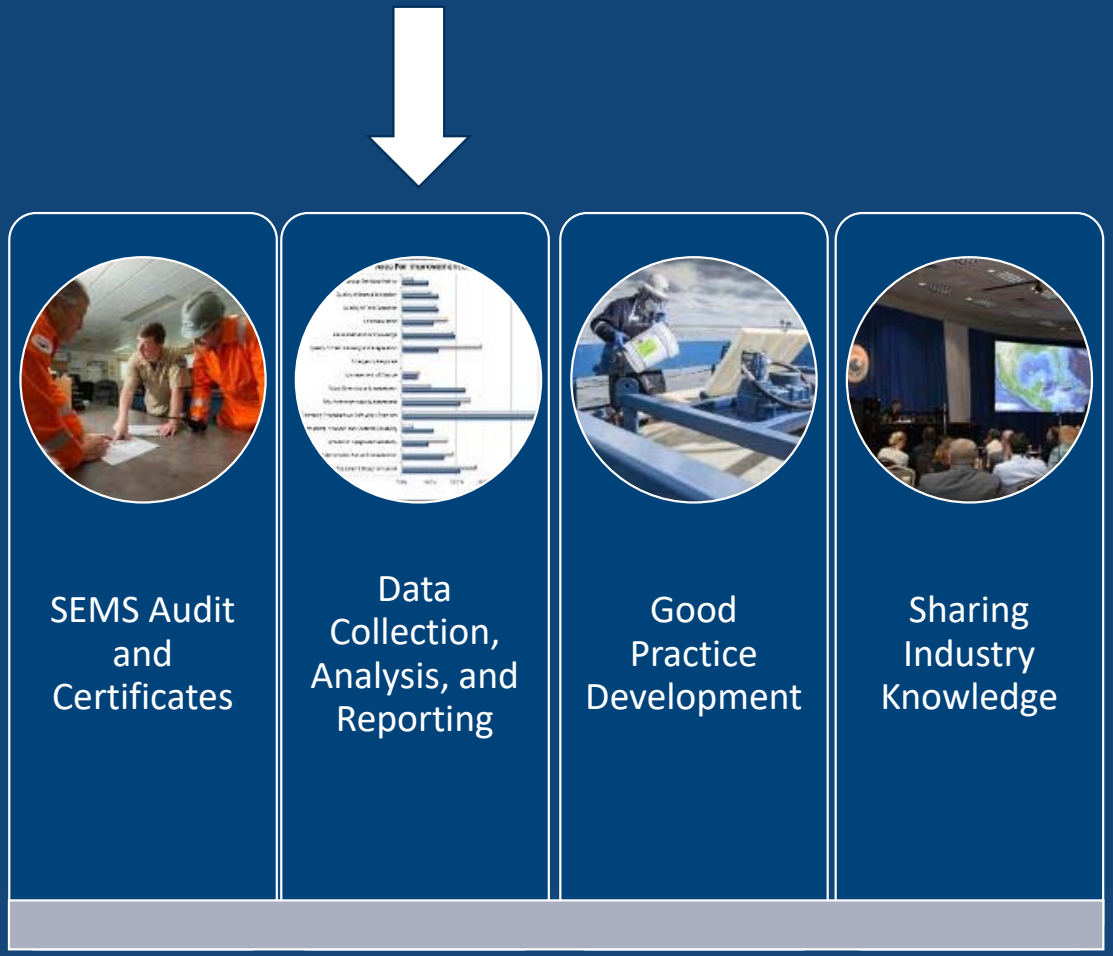
COS Overview

The Center for Offshore Safety is designed to promote the highest level of safety for offshore drilling, completions, and operations through leadership and effective management systems addressing communication, teamwork, and independent third-party auditing and certification.

COS will achieve operational excellence by:

- Enhancing and continuously improving industry's safety and environmental performance,
- Ensuring public confidence and trust in the oil and gas industry,
- Increasing public awareness of the industry's safety and environmental performance,
- Stimulating cooperation within industry to share best practices and learn from each other, and

Providing a platform for collaboration between industry, the government, and other stakeholders.



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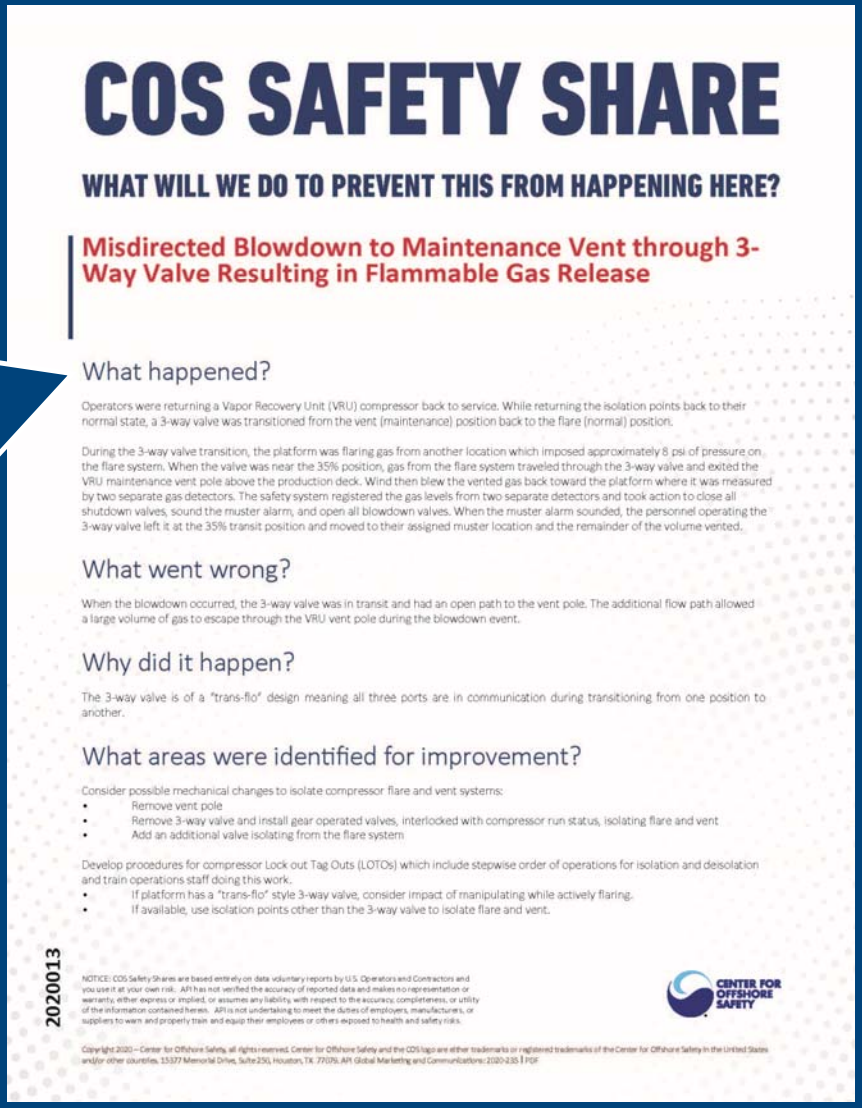
How is this data used?

Safety Share 2020013

What happened?

Operators were returning a Vapor Recovery Unit (VRU) compressor back to service. While returning the isolation points back to their normal state, a 3-way valve was transitioned from the vent (maintenance) position back to the flare (normal) position.

During the 3-way valve transition, the platform was flaring gas from another location which imposed approximately 8 psi of pressure on the flare system. When the valve was near the 35% position, gas from the flare system traveled through the 3-way valve and exited the VRU maintenance vent pole above the production deck. Wind then blew the vented gas back toward the platform where it was measured by two separate gas detectors. The safety system registered the gas levels from two separate detectors and took action to close all shutdown valves, sound the muster alarm, and open all blowdown valves. When the muster alarm sounded, the personnel operating the 3-way valve left it at the 35% transit position and moved to their assigned muster location and the remainder of the volume vented.



COS SAFETY SHARE

WHAT WILL WE DO TO PREVENT THIS FROM HAPPENING HERE?

Misdirected Blowdown to Maintenance Vent through 3-Way Valve Resulting in Flammable Gas Release

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Operators were returning a Vapor Recovery Unit (VRU) compressor back to service. While returning the isolation points back to their normal state, a 3-way valve was transitioned from the vent (maintenance) position back to the flare (normal) position.

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What went wrong?

When the blowdown occurred, the 3-way valve was in transit and had an open path to the vent pole. The additional flow path allowed a large volume of gas to escape through the VRU vent pole during the blowdown event.

Why did it happen?

The 3-way valve is of a "trans-flo" design meaning all three ports are in communication during transitioning from one position to another.

What areas were identified for improvement?

Consider possible mechanical changes to isolate compressor flare and vent systems:

- Remove vent pole
- Remove 3-way valve and install gear operated valves, interlocked with compressor run status, isolating flare and vent
- Add an additional valve isolating from the flare system

Develop procedures for compressor Lock out Tag Outs (LOTOs) which include stepwise order of operations for isolation and deisolation and train operations staff doing this work.

- If platform has a "trans-flo" style 3-way valve, consider impact of manipulating while actively flaring.
- If available, use isolation points other than the 3-way valve to isolate flare and vent.

2020013

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Safety Share 2020013

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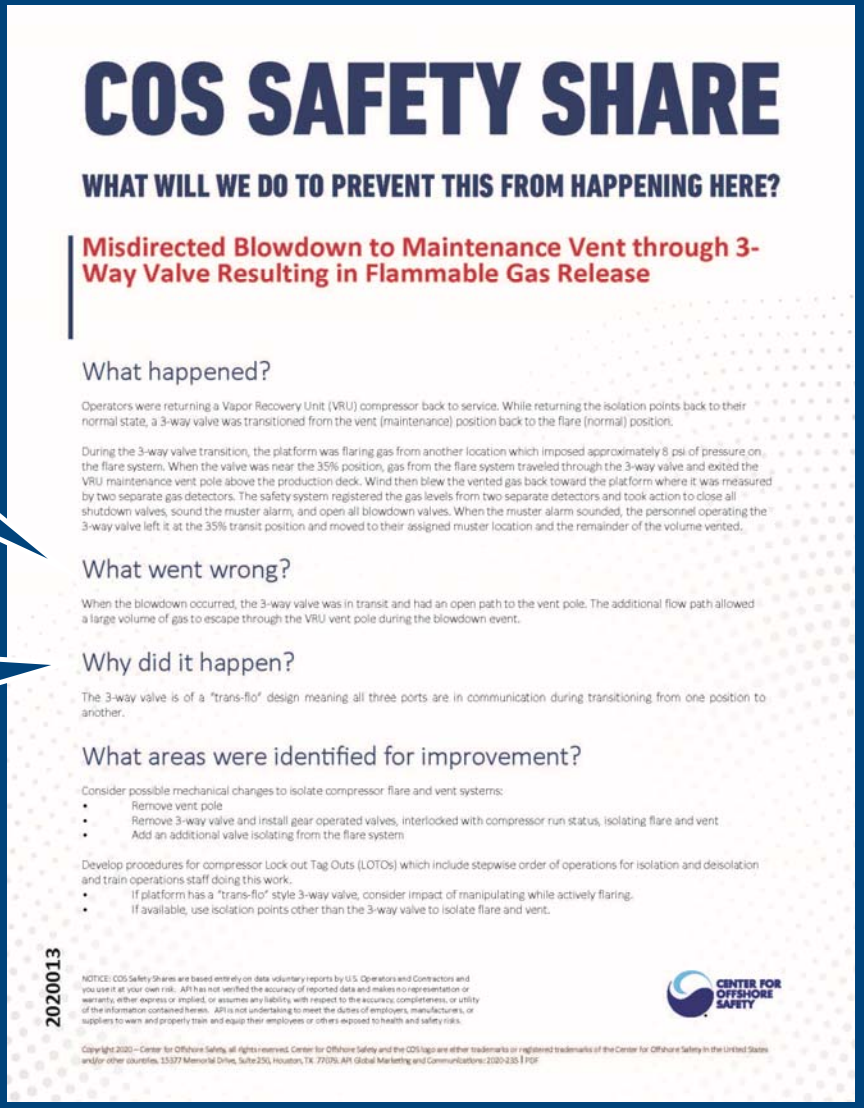

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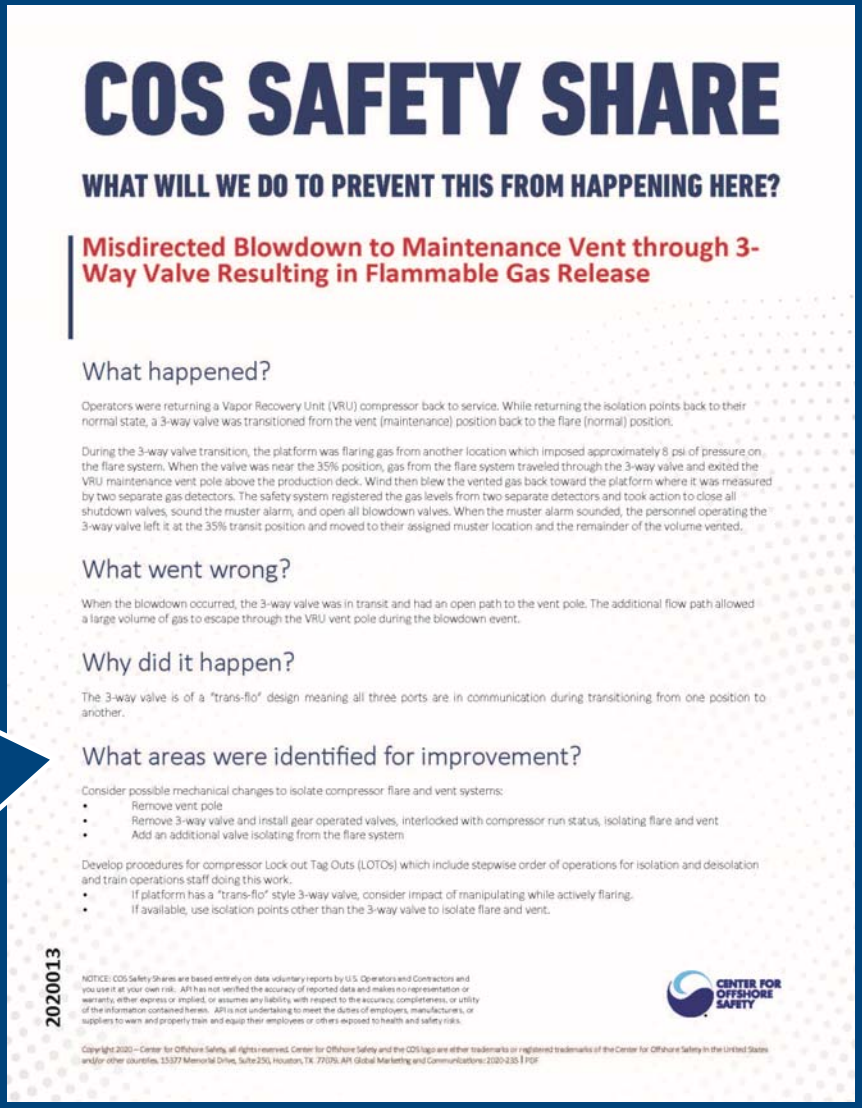

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COS Data Programs:

Safety Performance Indicators (SPI) Program
Learning from Incidents & Events (LFI) Program

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9 – Russ Holmes

Safety Performance Indicators – US OCS

Operator:

- SPI 1-10
- Work Hours
- ALL incidents – operator and contractor - within 500m of lease
- SPI 5 for Operator owned facilities and equipment

Contractor:

- SPI 1-4, 6-10 Incidents outside 500m or for non-COS Operators
- SPI 5 for Contractor owned facilities and equipment

SPI 1 is the frequency of incidents that resulted in one or more of the following:

A. Fatality
B. Five or more injuries in a single incident
C. Tier 1 process safety event
D. Level 1 Well Control Incident - Loss of well control
E. ≥ $1 million direct cost from damage to or loss of facility / vessel / equipment
F. 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:

A. Tier 2 process safety event
B. Collision resulting in property or equipment damage > $25,000
C. Mechanical Lifting or Lowering Incident
D. Loss of station keeping resulting in a drive off or drift off
E. Life boat, life raft, rescue boat event
F. Level 2 Well Control Incident - Multiple Barrier Systems Failures and Challenges

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

SPI 4 is the frequency of crane or personal/ material handling operations incident

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

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

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

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Learning from Incidents & Events

SPI 1 and SPI 2 Incidents

- Following the completion of any incident investigations
- Only 1 form per incident – usually submitted by company that did the investigation.

High Value Learning Events (HVLE)

- Incidents that didn't rise to the level of an SPI 1 or SPI 2, but that still provide valuable insight and learnings.
- Near misses / Close calls!

- **US OCS**
- ***US Onshore/State Waters***
- ***International***

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Areas for Improvement (AFI)

Physical Facility, Equipment, and Process

- *Design or Layout of a Facility or Individual Piece of Equipment*
- *Facility or Equipment Material Specification, Fabrication and Construction, or Quality Control*
- *Facility 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*

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2020 Annual Performance Report Data

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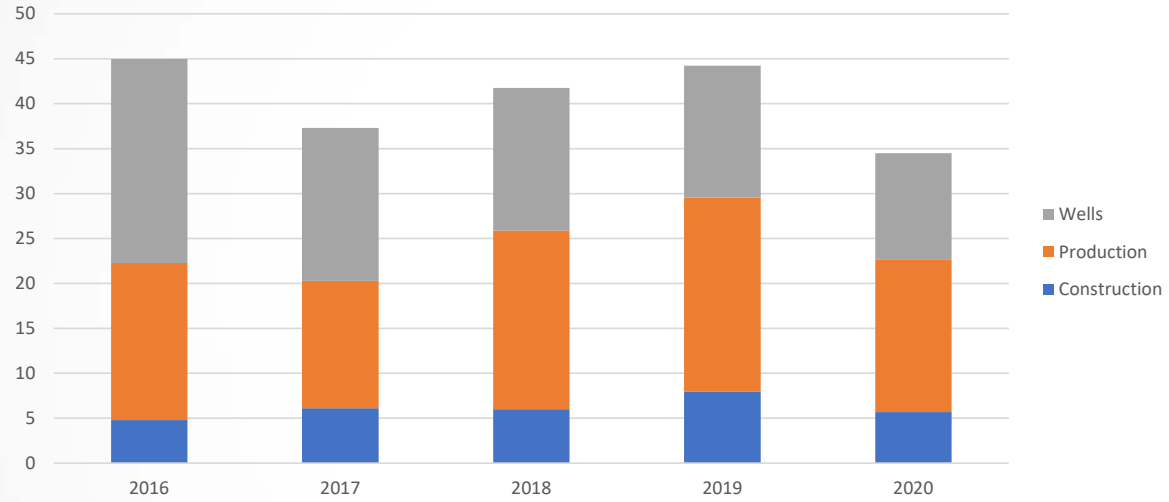
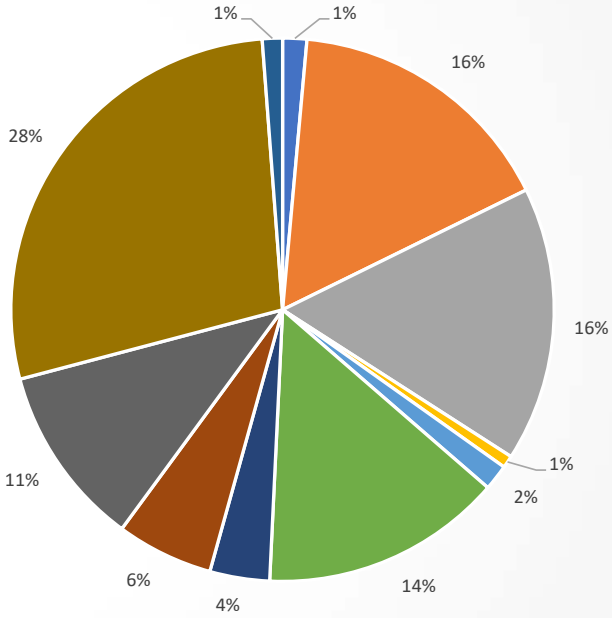
Work Hours (Normalization Factor)

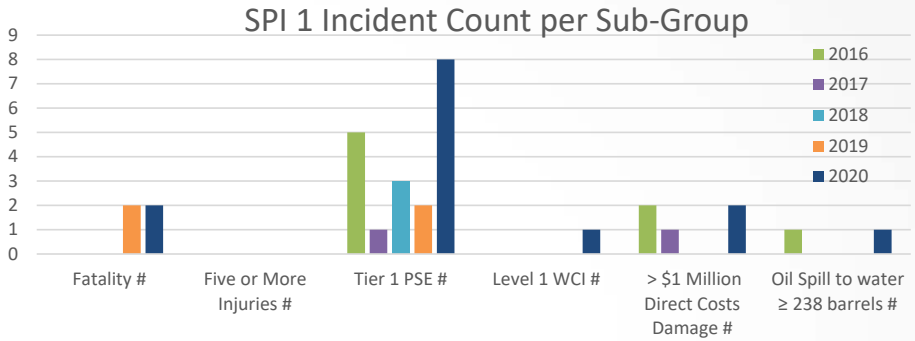


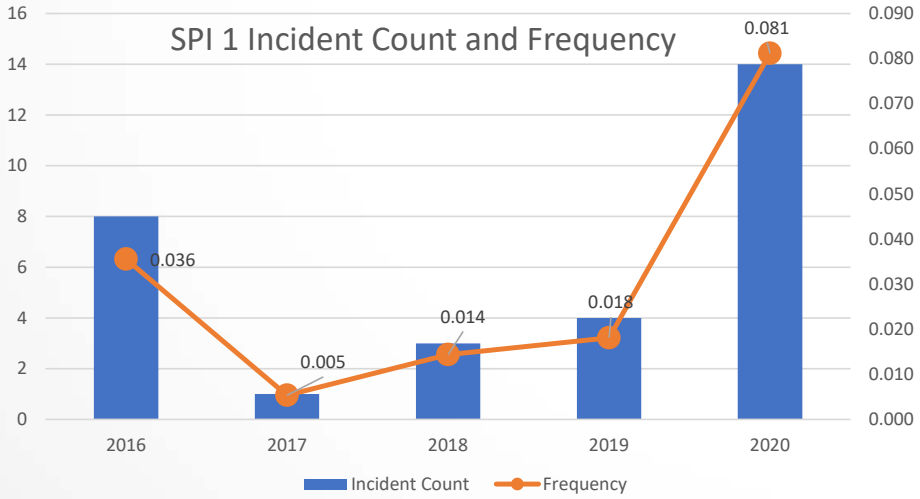


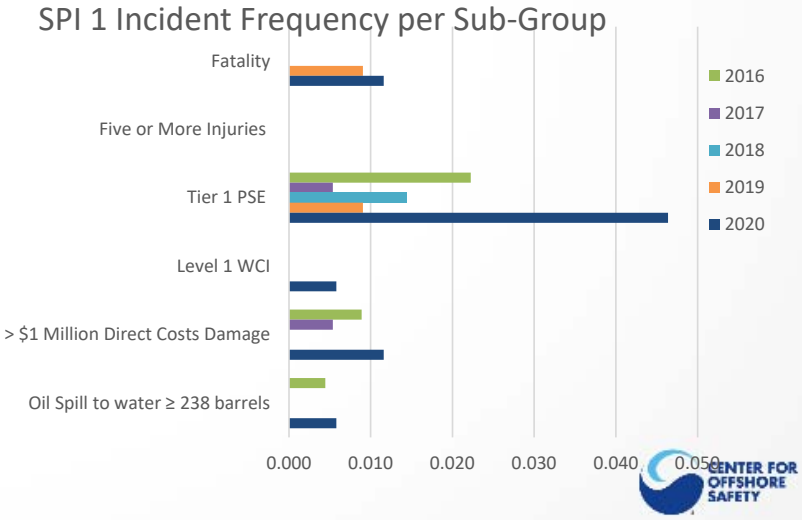
	2016	2017	2018	2019	2020
COS U.S. OCS Work Hours (Millions)	45	37	41	44	34

SPI 1

- 1A – 2 Incidents involving 1 or more fatalities
- 1B – 0 Incidents with Injuries to 5 or More
- 1C – 8 Tier 1 Process Safety Events (PSE)
- 1D – 1 Level 1 Well Control Incidents
- 1E – 2 Incidents resulting in damage ≥ $1MIL
- 1F – 1 Oil Spills to water ≥ 238 bbl







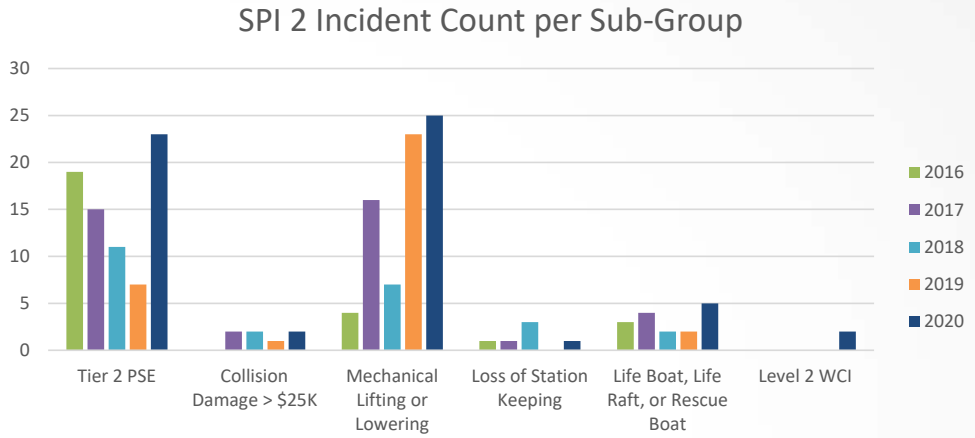
LFI Report – SPI 1E ≥ $1Mil Damage

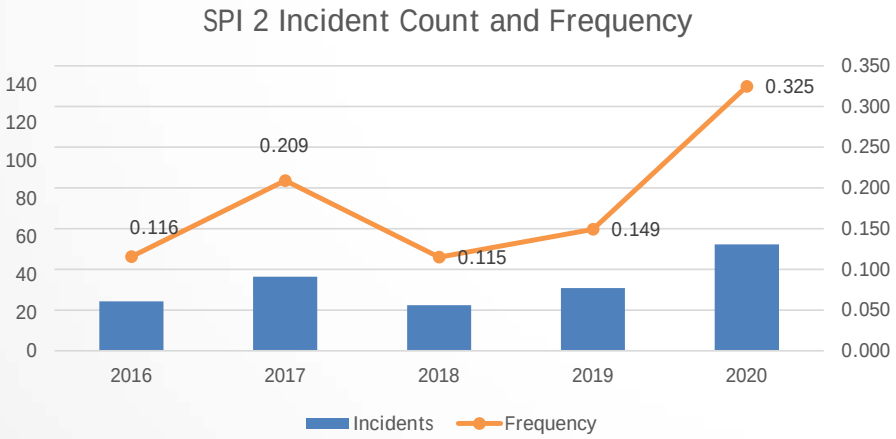
An operations deck operator was stationed at the L.A.C.T. (Lease Automatic Custody Transfer) unit on the production module testing PAGA (Public Address and General Alarm) alarm push button stations with a designated control room operator. The operations team members were utilizing a compliant JSA (Job Safety Analysis) and three-way communication for the task.

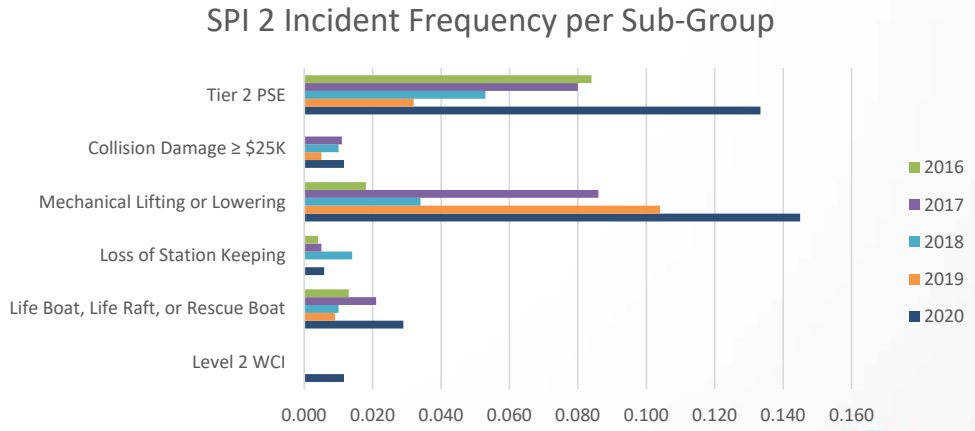
While en route to the East crane, a maintenance team member observed the operations team testing push button stations near the L.A.C.T. unit on the production module (Note: the east crane pedestal and L.A.C.T. unit are in proximity of each other on the production module). The maintenance team member was not clear which stations were being tested - PAGA or ESD stations. While ascending the east crane pedestal stairs, the maintenance team member identified PAGA alarm and ESD push button stations located on an elevated deck area of the crane pedestal. The maintenance team member then attempted to verbally communicate to the deck operator below by yelling from the elevated deck of the crane pedestal instead of using his radio. The maintenance team member's intent was to offer service to help the deck operator. The deck operator interpreted that the maintenance team member was asking if there were stations on the crane pedestal to be tested and responded "yes." The maintenance team member interpreted that the operations team member was giving approval to test the push button station so he pushed the ESD switch station and caused a facility shutdown.

SPI 2

- 2A – 23 Tier 2 PSE
- 2B – 2 Collision Damage ≥ $25,000
- 2C – 25 Mechanical Lifting Incidents
- 2D – 1 Loss of Station Keeping
- 2E – 5 Lifeboat, Life Raft, Rescue Boat Incidents
- 2F – 2 Level 2 Well Control Incidents







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LFI Report – SPI 2C Mechanical Lifting or Lowering

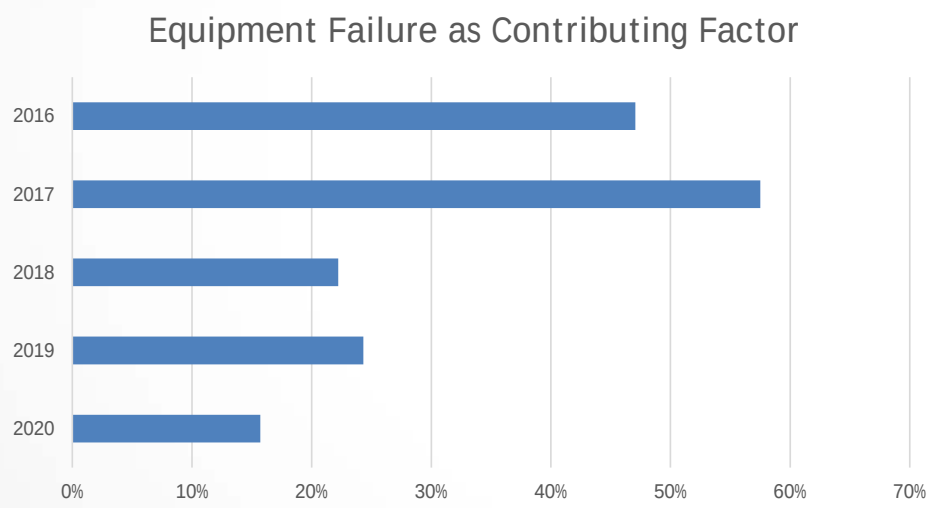
A Plug & Abandon crew was attempting to test a downhole cement plug using a tension packer connected to a 1500' work-string attached to the platform crane. While setting the tension packer the 50K shear ring failed unexpectedly at 26K resulting with an immediate decrease in load weight to 9K resulting in a shockload of the crane.

The 50K shear ring capacity, per manufacturer specifications, is a one pull value requiring the shear ring to be replaced after a failed setting attempt.

The investigation revealed that three prior attempts were made to set the tension packer, thus weakening the shear ring value with each attempt resulting in metal fatigue and the undesirable event.

SPI 3

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.



- 70 SPI 1 and SPI 2 Incidents Reported
- 11 (16%) of those 70 cited failure of equipment as a contributing factor
- Equipment Types:
  - 3 - Process Equipment/Pressure Vessels/Piping
  - 3 - Shutdown Systems/Automated Safety Instrumented Systems
  - 3 - Mechanical Lifting Equipment/Personnel Transport Systems
  - 1 - Lifeboat/Life Raft/Rescue Boat/Launch and Recovery Systems
  - 1 - Other

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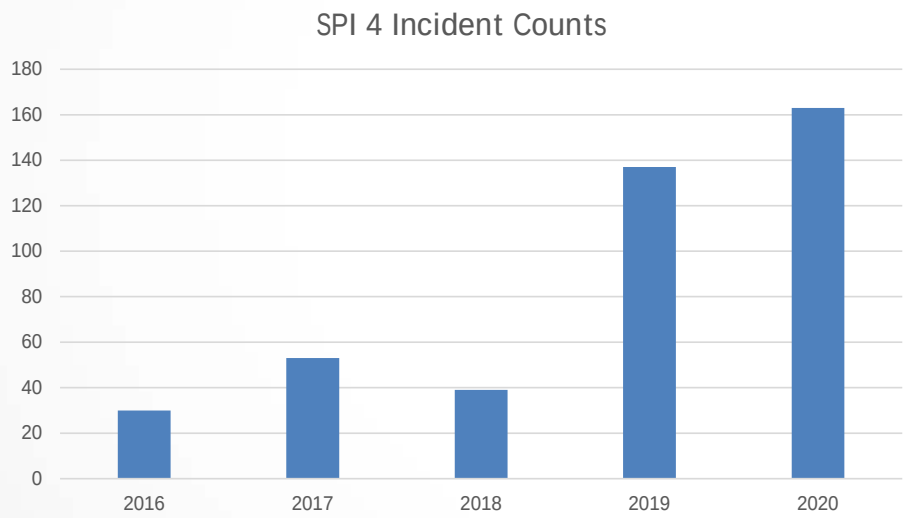
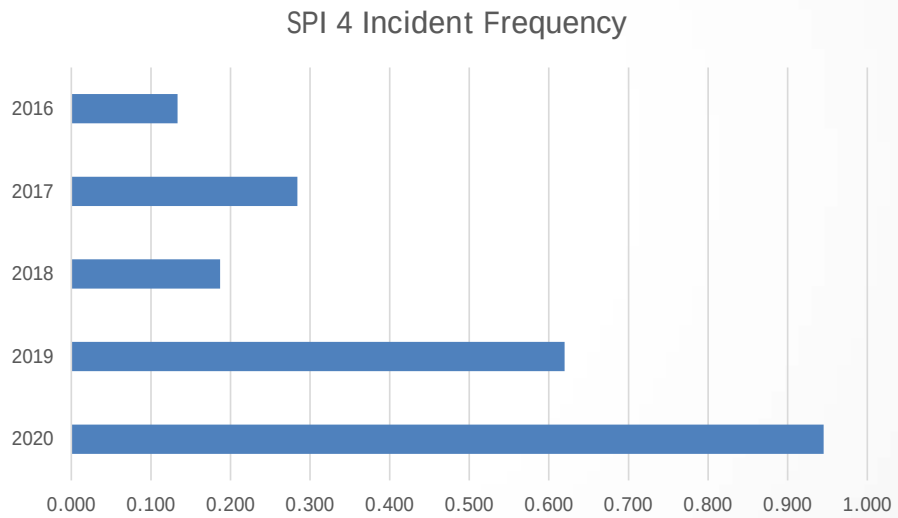
SPI 4

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





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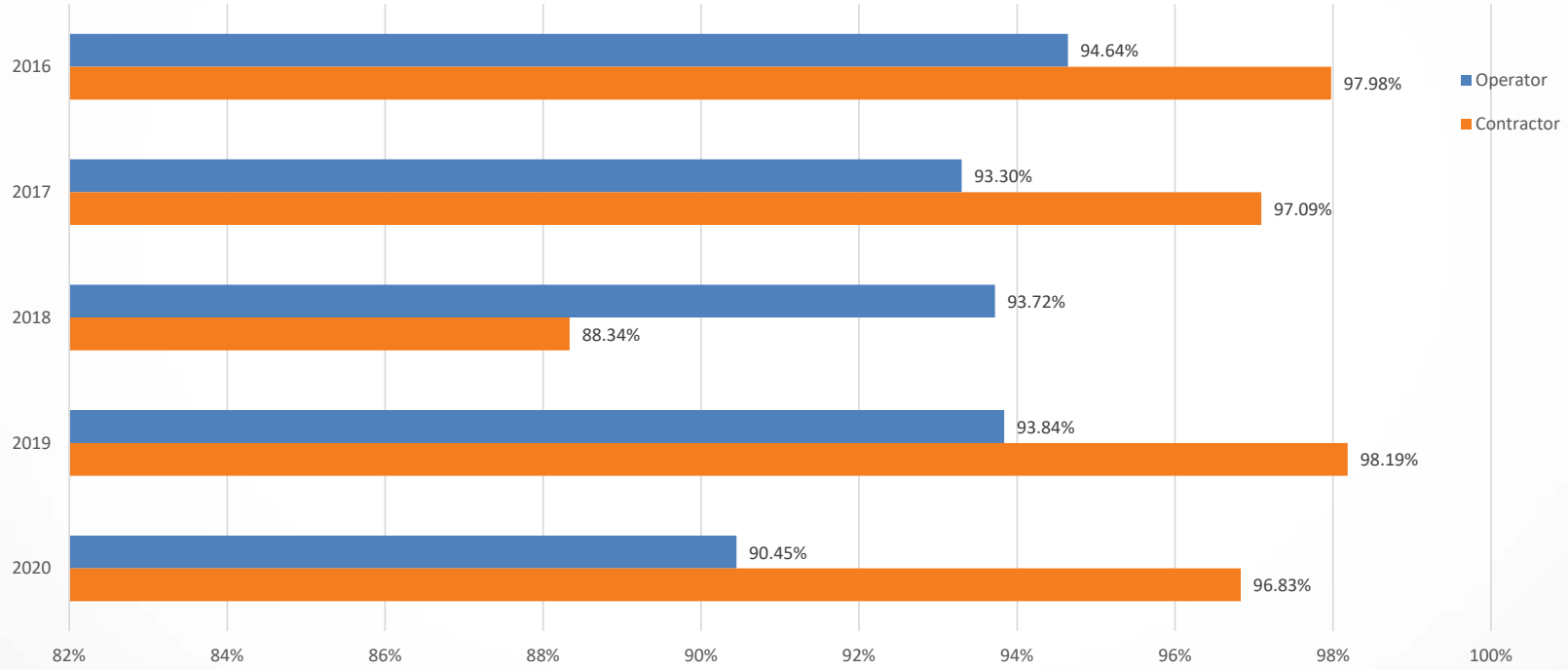

LFI Report – HVLE Maintenance, Inspection & Testing

A crew member was working on the west crane mezzanine deck. After placing a box containing a 59 lb swing/slew brake down on the boom's catwalk, the crew member started walking to grab the second brake. They turned around to place the second brake on the catwalk and saw the first brake roll off the catwalk and fall through a section between the catwalk's toe board and ladder.

The brake landed 28ft 8in below on the main deck. Another crew member on the mezzanine deck was within red barricade tape when brake landed 20 ft away.

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)
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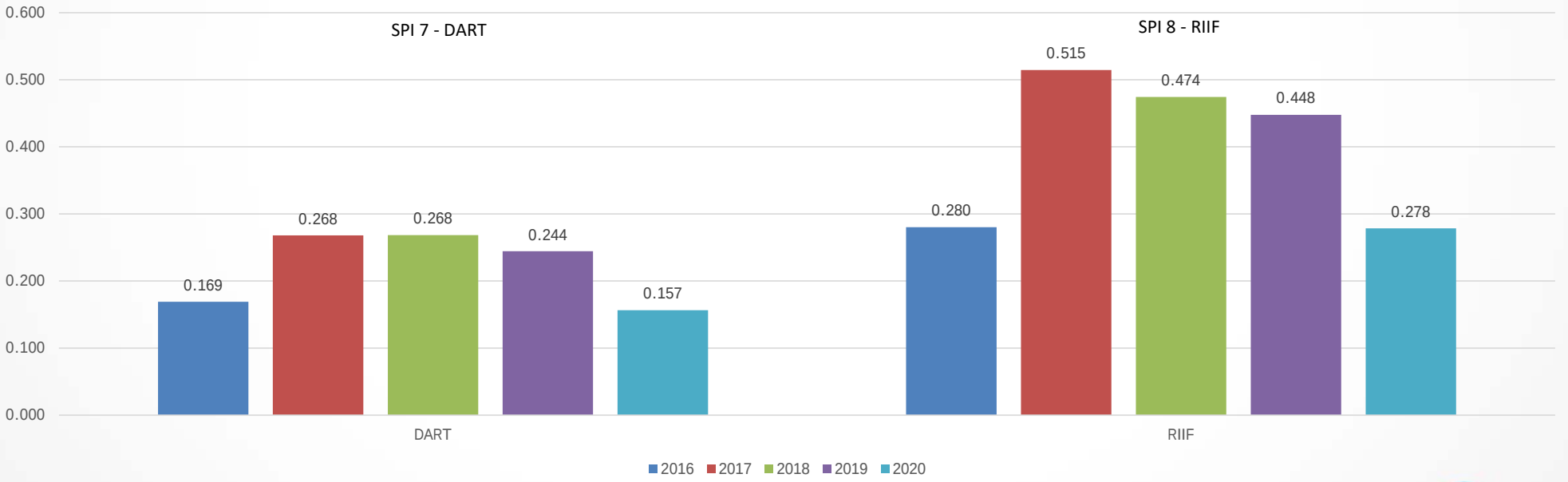
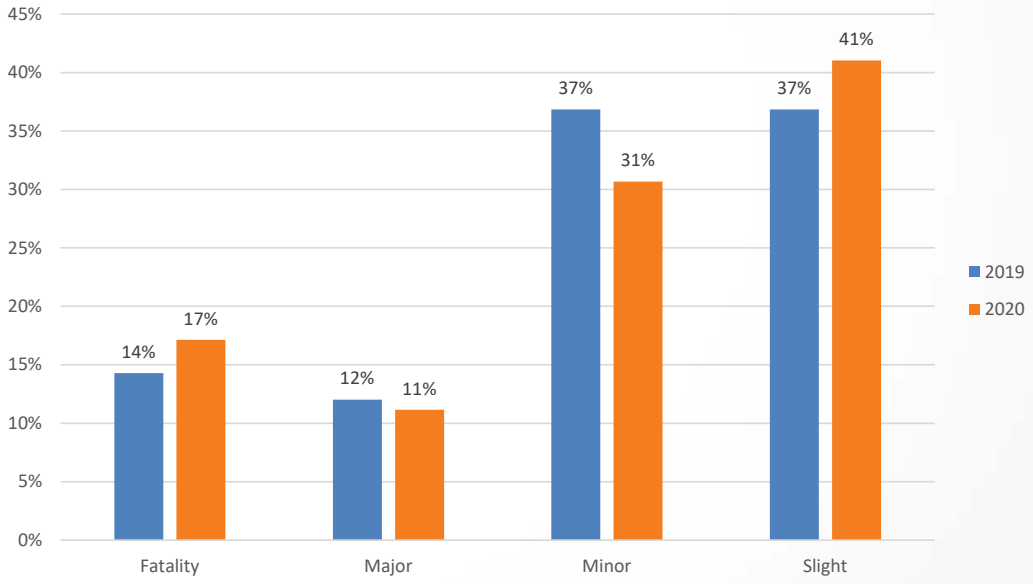
SPI 9 is the frequency of oil spills to water ≥ 1 barrel



SPI 10

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

- Based on definitions developed by the *DROPSOnline* network
- 251 Dropped Objects reported
  - 103 Slight injury ***potential***
  - 77 Minor injury ***potential***
  - 28 Major injury ***potential***
  - 43 Fatal injury ***potential***
- 185 of 251 (74%) resulted in zero harm



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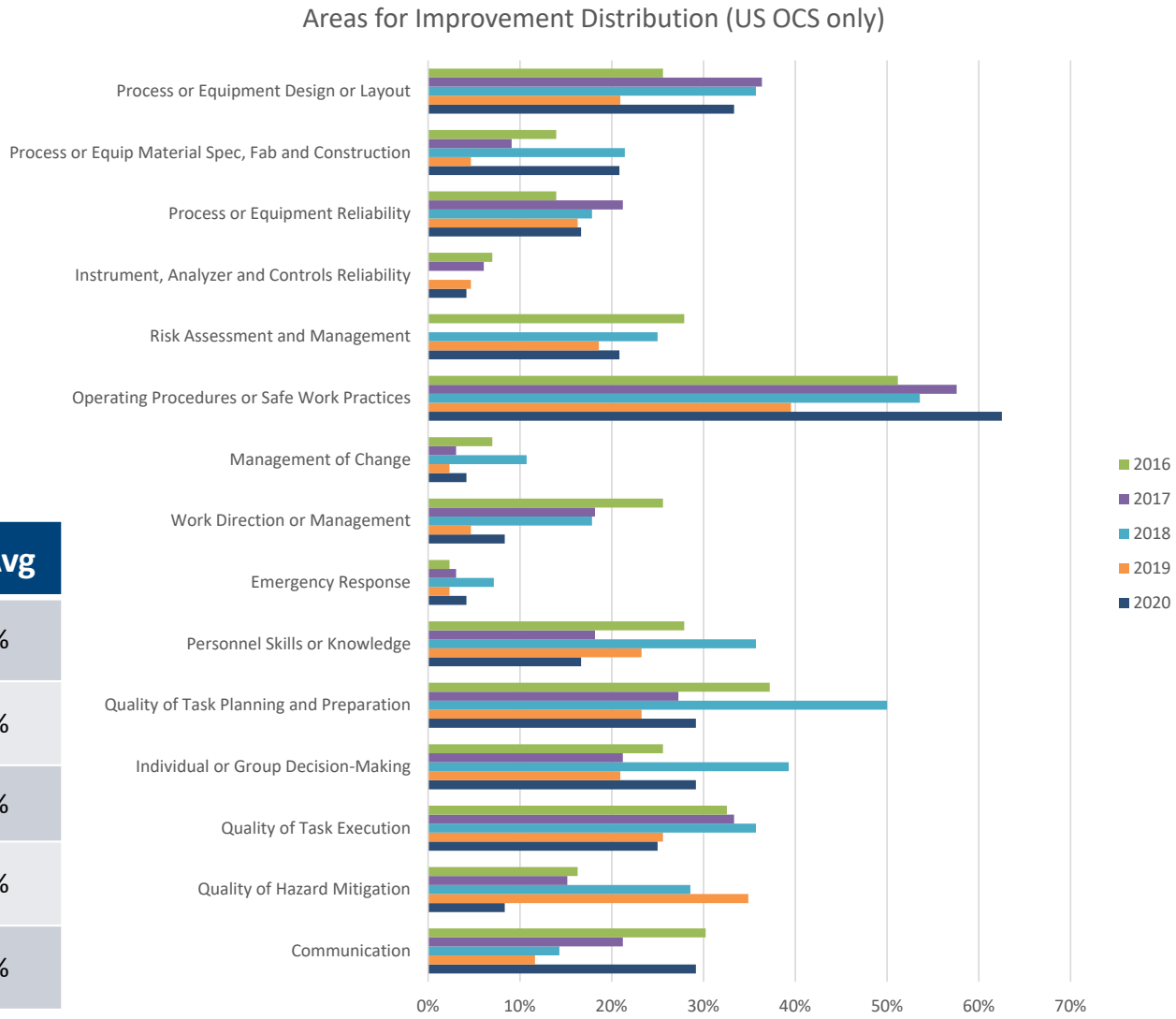
LFI Report – HVLE Drilling Operations – Normal, Routine

At approximately 1915 noise was heard by deck pusher from his office. He investigated and discovered the windsock from antenna platform level laying on heli-deck outside heli-lounge. It was determined that the windsock fell from its installed location platform above the heli-fuel wind wall on the starboard side.

Although the windsock descent may have been affected by wind resistance, the bracket maintained significant energy in flight, striking the deck leaving obvious marks. The windsock weighed 5.05 kgs (11 lbs) fell 7.9 m (26 ft) and risk ranked as high potential for serious injury or greater.

Areas for Improvement
U.S. OCS
2016-2020

Top 5 AFI 2016-2020	2020	5-yr Avg
Operating Procedures or Safe Work Practices	62.5%	52.9%
Quality of Task Planning & Preparation	29.2%	33.4%
Quality of Task Execution	25.0%	30.4%
Process or Equipment Design or Layout	33.3%	30.4%
Individual or Group Decision Making	29.2%	27.2%



LFI Report – HVLE Drilling Operations – Normal, Routine

While in the process of skidding the derrick to the desired position, the rig catwalk, which was suspended and connected to the starboard crane with a two-part sling, the crane boomed down suddenly which caused the load to slew uncontrolled. This resulted in some damage to the structure of the catwalk.

Skidding operations was stopped immediately and the crane operator was advised by the Toolpusher to place the load safely back on the deck.

There were no injuries as a result of this incident.

Upcoming Events!

9th Annual COS Forum – October 27 – Virtual event

COS Webinar Series

- **Process Safety Fundamentals – November 4 – 9:00am**
- **COS-3-08 Verifying Existing Barriers – November 11 – 9:00am**

Registration information:
https://www.centerforoffshoresafety.org/announcements_page/Events-and-webinars

Become a Member!

- Annual Membership Fee
  - API Members - $0 additional annual fee to join COS
  - Non-API Members - $5000 annual membership fee

- For Additional Information:
- Russ Holmes – holmesr@centerforoffshoresafety.org
- Julia FitzGerald – fitzgeraldj@centerforoffshoresafety.org

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Available for download: October 4, 2021

www.centerforoffshoresafety.org

Questions?

Thank you!

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