BSEE Risk Based Inspections – Using Data to Drive Performance

A COS Webinar
July 22, 2021
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.
Agenda

- **Introduction**  
  Russell Holmes

- **BSEE RBI Presentation**  
  Jason Mathews

- **Q&A**  
  Jason Mathews

- **Conclusion**  
  Russell Holmes
COS Overview

The Center for Offshore Safety is designed to promote the highest level of safety for the offshore oil and gas industry through effective leadership, communication, teamwork, use of disciplined management systems and independent third-party auditing and certification.

COS will achieve operational excellence by:

• Enhancing and continually improving industry's safety and environmental performance.
• Improving public confidence and trust in the oil and gas industry.
• Increasing public awareness of industry's safety and environmental performance.
• Fostering collaboration between industry, the government, and other stakeholders to develop and share good practices and learnings.
Using Data to Drive Performance

Office of Safety Management
Gulf of Mexico Region

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”
BSEE Inspection Program

**Facility Based Risk Inspections**
Based on analysis of low probability, high consequence areas of a specific facility

**Performance Based Risk Inspections**
Based on Analysis of Key Performance Indicators and utilizing Trend Analysis to focus on reducing likelihood of events and compliance issues Gulf wide

**Annual Production Facility Inspections & Monthly Well Operation Inspections**
Based on OCS mandate for inspections, Regional policy. Includes Follow-up on specific facility based on Increased Oversight Identification
BSEE RBI Program

Incident and INC Data → Risk Based Inspections
Overview of Dropped Object PBRI

Performance Based Risk Inspection (PBRI) Process

- Identify regulatory compliance protocol questions
- Identify possible facilities based on INSC issued
- Develop Protocol Questionnaire
- Select Focus Topic for PBRI
- Select Facility for PBRI
- Conduct Training Sessions with District Personnel
- Conduct Offshore Site PBRI inspections
- Conduct Offshore Site PBRI inspections

PBRI Process

- O&M Analyzes Incidents
- Data from Previous 3 Years
- Cross Functional Evaluation
- Identify Causal Factors for Incidents
- Identify possible facilities based on previous incidents
- Identify possible facilities based on previous incidents
- Identify possible factors based on previous incidents
- Trace questions are scored by O&M based on the applicability to the component, test to bring tissue on.

BSEE

Bureau of Safety and Environmental Enforcement
What was the data telling BSEE?
OCS Lifting Trend

Incidents by Quarter

2019 Q2 2019 Q3 2019 Q4 2020 Q1 2020 Q2 2020 Q3 2020 Q4 2021 Q1

2019 Q2 2020 Q2 2021 Q1

0 20 40 60 80 100 120

Lifting
Nov 2020 – April 2021 Trends

LIFTING INCIDENTS BY OPERATION TYPE

- WELL OPS
  - <1000’, 9
  - >1000’, 57
- PRODUCTION
  - <1000’, 28
  - >1000’, 40

Lifting Incidents by Type of Lift

- Deck to Deck: 34
- Marine vessel to Deck: 31
- Deck to Marine vessel: 24
- Rig Floor / V-door / Well: 36
- Non-Lifting: 6

Types of Lifting Failures

- BOOM FAILURE
- SHOCKLOAD EVENT
- BOOM CONTACTED
- CABLE / FAST LINE PARTED OR CONTACTED / BRAKE...
- SLING / PADEYE / ATTACHMENT FAILURE OR SNAG
- LOAD SNAGGED OR CONTACTED
- LOAD SHIFTED
- TAG LINE SNAGGED OR PARTED
- RIG ASSOCIATE EQPT FAILURE
- PERSONNEL FAILURE
- DROPPED OBJECT
Nov 2020 – April 2021 Trends

- Total Reported Lifting Incidents
- Total HiPo Incidents

<table>
<thead>
<tr>
<th>Month</th>
<th>Total Reported</th>
<th>Total HiPo</th>
</tr>
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<tbody>
<tr>
<td>NOV-20</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>DEC-20</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>JAN-21</td>
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<td>6</td>
</tr>
<tr>
<td>FEB-21</td>
<td>17</td>
<td>7</td>
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<tr>
<td>MAR-21</td>
<td>26</td>
<td>6</td>
</tr>
<tr>
<td>APR-21</td>
<td>25</td>
<td>6</td>
</tr>
</tbody>
</table>
Nov 2020 – April 2021 Trends

GOM Lifting Injuries vs. Total Injuries

- Total: 73 Lifting Injury, 23 All Injury
- Lost Time: 15 Lifting Injury, 5 All Injury
- Restricted Work / Job Transfer: 18 Lifting Injury, 4 All Injury
- Other: 40 Lifting Injury, 14 All Injury

Lifting Injury vs. All Injury
Nov 2020 – April 2021 Causal Factors

Root Causes

- PROCEDURES
- COMMUNICATIONS
- WORK DIRECTION
- WEATHER
- HUMAN ERROR
- EQUIPMENT DEFECTIVE
- DESIGN
- HAZARD RECOGNITION
- UNKNOWN
WORK DIRECTION - HiPo

- Path of load, safe zones, and escape routes were not discussed pre-job.

- Boom tip was not centered over the load, causing it to swing.

- Designated Signal Person (DSP) did not have a clear line of sight of the Injured Person (IP).
HAZARD RECOGNITION – HiPo

- Connection between test joint and lift sub were made up with chain tongs vs iron roughneck 32 hours prior to the incident.

- Motion of the vessel loosened the connection over the 32 hours.
HiPo Event with Multiple Common Root Causes

- No communication with M/V employees.

- No pre-job briefing or pre-lift meeting to assign roles.

- Wind caused basket to start rotating.
Expansion of Lifting Causal Factors

- Failed to confirm the load was centered prior to either commencing the initial lift or repositioning the load.
- Failed to ensure adequate clearance in the landing zone:
  - Crew did not recognize until load was closer to the landing zone that the area was too tight to fit the load.
- Potential obstructions failed to be identified during the pre-job reviews when determining the load travel path.
- Lack of timely communication between the Designated Signal Person (DSP) and the Crane Operator.
- Operations either conducted inconsistently or not covered under current established SOPs.
BSEE Recommendations to Industry

- Continuously reinforce hands-off policies during pre-job meetings.
- When deviations occur, stop work and reassess the job scope.
- When communicating real-time work instructions to personnel involved in the task, do not disregard any newly introduced hazards (i.e., abrupt heightened weather conditions).
- Inspect loads at dock prior to transportation to verify certification dates, weights, working limits, condition of slings, shackles, thread protectors, etc.
- Re-emphasize the importance of red zones and monitoring moving equipment on the rig floor.
BSEE Actions

- Multiple Applicable Safety Alerts have been drafted and are currently in review by BSEE GOM Regional Management:
  - Recent Uptick in Lifting Injuries due to Unrecognized Pinch Point Hazards
  - Miscommunication of Manifest Weights
  - Jacking Up Lift-Boat During Crane Operations Causes Injury

- Active Participant in API Safe Lifting Conference in Sept. 2021

- Dropped Object Performance Based Risk Inspection (PBRI) June 2021
Dropped Objects PBRI

- 20 facilities/rigs inspected over the course of 2 weeks across the GOM.

- 18 Protocol Questions that covered JSAs, SWPs, OPs, Training, etc.
  - 90 BSEE personnel trained over 4 sessions

- 14 Unique Operators

- Follow-up meetings and reports outs to Designated Operators on a facility-by-facility basis
**Dropped Object PBRI Protocol**

<table>
<thead>
<tr>
<th>Procedure/Task</th>
<th>Comments Section</th>
</tr>
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<tbody>
<tr>
<td><strong>PB 1</strong></td>
<td></td>
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<tr>
<td>N/A</td>
<td></td>
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<tr>
<td>Does the Operator / Contractor have a dropped-object prevention program implemented at the subject facility? If applicable, ask for the latest dropped-object inspection(s). Quickly review and determine if any corrective actions should have been undertaken in a timely manner based on the dropped object inspection(s) / hazard hunt(s). Inspection should be scheduled at a suitable frequency taking into account the types of activities being undertaken in an area and should identify all potential opportunities for items to become dislodged or damaged during normal operations. These inspections should look at the primary and secondary methods (i.e. secondary retention) of securing for items and if either is selective then this should be identified and remedied accordingly through a Mechanical Integrity / work order system.</td>
<td></td>
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<tr>
<td><strong>PB 2</strong></td>
<td></td>
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<tr>
<td>Off/PC</td>
<td></td>
</tr>
<tr>
<td>When was the last Hazard Hunt conducted by the operator / contractor for dropped objects on the subject facility? BSEE teams should walk the facility with platform representative and look for:</td>
<td></td>
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<tr>
<td>• Unsecured objects stored or unsecured at height</td>
<td></td>
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<tr>
<td>• Items left on top of containers / slat frames / grating etc</td>
<td></td>
</tr>
<tr>
<td>• Items stored inappropriately at height</td>
<td></td>
</tr>
<tr>
<td>• Stacking material next to handrails</td>
<td></td>
</tr>
<tr>
<td>• Items that are locally modified / homemade and not certified</td>
<td></td>
</tr>
<tr>
<td>• Items loaded with inadequate means to secure properly</td>
<td></td>
</tr>
<tr>
<td>• Uncertified lifting equipment (sling, rigging, etc.)...not up to date</td>
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Focus – Lifting, Dropped Object
Dropped Object PBRI Finding & Recommendation

- During the PBRI, 10-percent of the facilities inspected were issued incidents of noncompliance (INCs) for issues associated with the Dropped Objects inspection.

- Recommendation: OCS Operators should review the results of the Dropped Objects PBRI and use it as a basis for conducting focused Hazard Hunts on their GOM facilities to reduce the likelihood of similar incidents. Operators should continuously inspect their assets for any potential drops (lifting and non-lifting) to prevent the occurrence of dropped objects, and document the findings and associated corrective actions accordingly.
Dropped Object PBRI Finding & Recommendation

- BSEE concluded the majority of inspected production facilities did not have an implemented dropped object prevention program; however, programs on deep-water drilling rigs appeared to be implemented for identifying and mitigating the hazards associated from objects that have the potential to fall from height.

- Recommendation: Offshore Production Operators and Contractors should develop a Prevention of Dropped Objects strategy and action plan to identify and assess individual work areas and activities for dropped object potential. This strategy should cover both dynamic and static dropped objects. A dynamic dropped object is an object that falls from its previous position due to applied force. A static dropped object is an object that falls from its previous position under its own weight without any applied force.
Dropped Object PBRI Finding & Recommendation

- BSEE concluded most of the facilities inspected had some version of a Hazard Hunt, but only a limited portion focused on the potential of dropped objects on the subject facilities. Additionally, BSEE inspection teams confirmed the majority of hazard hunts were not documented, and BSEE identified hazards on multiple facilities that had never been identified in previous Hazard Hunts conducted by either the Operator or Contractor representatives.

- Recommendation: Operators and Contractors should establish regular inspection frequencies of areas for identifying any potential dropped objects and record the results within a work order register. At a minimum, inspections should focus on a specific area and include procedures to look for unsecured objects stored or unsecure at height; items left on top of containers / skid frames / grating etc.; items stored inappropriately at height; stacking material next to handrails; items that are locally modified / homemade and not certified; items loaded with inadequate means to secure properly; and uncertified lifting equipment (slings, rigging, etc...not up to date).
Dropped Object PBRI Finding & Recommendation

- During the Dropped Object PBRI, BSEE identified good practices of barrier management while lifts were taking place and in the presence of moving equipment on the rig floor. On lifts not associated with the rig floor and work above decks on production facilities, restricted access areas need improvement.

- Recommendation: Operators and Contractors should identify those areas on the facility where there is a significant risk of being struck by dropped objects or moving equipment. Once the areas are identified, the information shall be communicated to offshore personnel, and the areas should be appropriately marked with signs and/or barriers. Dropped Object Prevention Programs should be inclusive of pedestal cranes and other lifting devices; not exclusively associated with well operations in and around the rig floor.
Dropped Object PBRI Finding & Recommendation

- BSEE concluded the majority of the Operators did not have specific training requirements for the prevention of dropped objects for the offshore personnel at the facilities.

- Recommendation: Operators and Contactors should develop standalone training requirements for those individuals exposed to or undertaking the inspection of potential dropped objects. The individuals should be given suitable information and guidance on how to identify, categorize, and mitigate items with the potential to become a dropped object.
Dropped Object PBRI Finding & Recommendation

During the Dropped Object PBRI, BSEE concluded JSAs were completed for operations at the time of the inspection; however, multiple gaps were identified by BSEE teams that need improvement. For example, JSAs were not completed at the worksite to visually inspect for hazards; JSAs were limited to pre-printed text and not further analyzed; and JSAs with lifts, e.g. Pick-up Pipe from V-door, completely negated the potential for dropped object potential.

Recommendation: Operators and Contactors should evaluate all lifting JSAs to ensure they address: the control of objects with the potential to fall; the work area was visually inspected for loose items; any areas below elevated work decks / mezzanine decks with the potential for dropped objects are secured with barrier and warning tags identifying the hazard; and evaluating the condition of work baskets, lifting contents, and rigging equipment (e.g. shackles, slings, etc.).
BSEE concluded lift area controls were implemented on all inspected facilities, but there was a wide range of control measures based on the risk associated with the lift. Examples of some of the control measures identified were bump guards, securing secondary retention wires and physical barriers to limit personnel access and exposure. BSEE also identified gaps on some facilities with working with tools at height.

Recommendation: To ensure lift and work areas are controlled, Operators and Contactors should assess the operation and/or work area to prohibit incursion by personnel not involved in the operation, ensure procedures require workers to firmly secure tools while working at heights, and adequate communication exists to signal the start of a lift.
Dropped Object PBRI Finding & Recommendation

- BSEE concluded (on those applicable facilities) offshore personnel were aware of the hazards associated with pipe-handling and most of the contractors had programs to ensure tubular running system is correctly sized.

- Recommendation: Prior to use, Operators and Contractors shall verify all pipe handling systems are fully functional, interlocking safety systems are confirmed to be functional, and all pipe handling equipment (slips, elevators, pipe racking systems, finger board spacing, etc.) are dimensionally correct for tubular handling. A Change-Out Log should be utilized when changing elevator sizes to document and confirm the appropriate size is latched for the string.
BSEE concluded multiple good practices were in place with the coordination and lifting of cargo to and from offshore facilities. Minimal items were identified during the Dropped Object PBRI that need improvement. These areas include communication with shore-bases and platforms, color and shape marking labels of certain weights and dimensions, assessment of slings and rigging in pre-use inspections, and pre-lift inspections of cargo (container, tubulars, or other loads).

Recommendation: Operators and Contractors should review their lifting practices to ensure it addresses the design, material, manufacture, inspection, repair, maintenance, and marking requirements for offshore cargo carrying units (CCU) and other cargo lifting sets and loads. Operators and Contractors should continue to adequately conduct preliminary checks prior to offloading/onboarding, with an emphasis on confirming manifest weights, determining environmental conditions (i.e. wave height, wind speed, etc.), and inspecting all lifting and rigging equipment thoroughly.
The inspection concluded there was a broad range of lifting condition parameters / limits (e.g., maximum permissible wind speed, sea state, etc.). Also, the defined parameters in the inspected programs were either “sustained” or “reach/exceed” which led to additional disparity between facilities.

Recommendation: Operators and contractors should consider adding a lift checklist to the Job Safety Analysis prior to making lifts. Factors in the checklist should include, but not be limited to, wind speed, wind direction, sea state, visibility, and load characteristics. Operators and contractors should take into account evergreen weather hazards when conducting lifts on a continuous basis.

### Table 2: Lifting Condition Parameters

<table>
<thead>
<tr>
<th>Wind Speed (mph)</th>
<th>Significant Wave Height (ft)</th>
<th>Cargo Lifting</th>
<th>Personnel Lifting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20</td>
<td>0 to 6</td>
<td>Normal Lifting Operations</td>
<td>Normal Personnel Lifting Operations</td>
</tr>
<tr>
<td>21 to 25</td>
<td>6 to 8</td>
<td>Permit Required Lift</td>
<td>Permit Required Lift</td>
</tr>
<tr>
<td>greater than 25</td>
<td>greater than 8</td>
<td>No General Lifting Emergency lifting only (requires approval from the AOL Representative)</td>
<td>No Personnel Lifting</td>
</tr>
</tbody>
</table>
Dropped Object PBRI Finding & Recommendation

- BSEE determined that all the facilities that had rig floor equipment (pipe racking system, elevator, etc.) in use had good practices and communication with flaggers. BSEE also noted good practices of having three-part confirmation for latching and Drill Floor Observers to monitor activity on the rig floor when ancillary equipment is in motion.

- Recommendation: While ancillary equipment is in motion, Operators and Contractors should require an observer to monitor activity on the rig floor and stop the job if unsafe actions are witnessed. All lifting tasks should require the use of flaggers when rig floor equipment such as pipe racking systems, elevators, etc. is in operation.
Dropped Object PBRI Finding & Recommendation

- BSEE determined all PBRI facilities had an MOC program implemented; however, there were no recent MOCs (in the last six months) that were associated with mounting any new fixture to existing structures or equipment, including additional secondary securing methods, or installing new equipment at height.

- Recommendation: Operators should ensure all new equipment or structures added to their facilities trigger the MOC process to address newly introduced hazards as the result of the change. The MOC process should also ensure it does not compromise the safeguards that were built into the original design.
Dropped Object PBRI Finding & Recommendation

- BSEE determined multiple facilities had I-beam clamps that were not-in use with obvious metal loss and potential dropped objects hazards.

- Recommendation: Operators and contractors should review their facilities to determine if any I-beam clamps, or other similar components such as chain falls, are potential static dropped object hazards. Operators and contractors should ensure that I-beam clamps are dimensionally sound for their application. Additionally, operators and contractors should include I-beam clamps as part of their Preventative Maintenance programs for validating they remain in an adequate condition.
Dropped Object PBRI Finding & Recommendation

- BSEE determined that the majority of Operators and Contractors don’t have a policy for bypassing the high angle kickout or the function to bypass is disabled in the crane. In those cases where the high angle kickout could be bypassed, it appears to have been done to place the crane into the rest for maintenance.

- Recommendation: Operators should review the cranes on their facilities and determine if the Crane Operator has the ability to bypass the high angle kickout. If the Crane Operator has the ability to bypass the device, either disable/remove the bypass option or ensure there is a safe process, method, and criteria in place for authorizing the bypass.
Dropped Object PBRI Finding & Recommendation

- BSEE determined that multiple High Potential incidents occurred on the subject facilities in the past year; however, they were not reported to BSEE because of the reporting requirements captured in 30 CFR 250.188.

- Recommendation: BSEE should evaluate their incident reporting rule requirements and determine whether dropped objects that do not result in another incident type (e.g. injury, property damage, marine debris, etc.) should be included into BSEE incident reporting requirements.
Dropped Object Hazard Shared by Operator
Good Practices Observed in PBRI

- Dock Picture for Lift Planning
Good Practices Observed in PBRI

- Lift Witness - Dock takes pictures of all equipment sent out and verifies sizes/weights/rigging. If the load is over a certain weight, a Lift Witness must ride the boat and oversee the lift.
Good Practices Observed in PBRI

- Elevator Sign-off - Rig has a form when changing elevator sizes that must be signed off by Assistant Driller and Drill Site Manager. Shows new size or make and serial number and elevator insert size.
Good Practices Observed in PBRI

- Netting - Different types of secondary retention on the lights (bars around lights, netting around lights, or cables)
Good Practices Observed in PBRI

- Drill Floor Observer - Drill Floor Observer (DFO) positions have been established to monitor activity on the rig floor when ancillary equipment is in motion. The DFO's sole role is to stop the job if unsafe actions are witnessed.
Good Practices Observed in PBRI

- Color Code Tubular - All elevator/slip inserts are color coded according to size.
Good Practices Observed in PBRI

- CCU Checklist - Eighteen (18) point checklist that is utilized to ensure cargo is compliant to ship in accordance with their safe work practices. Document is signed off on by an inspector and linked to a manifest.
Good Practices Observed in PBRI

- Red Zone Management Log - On the rig floor there is a sign in/out log for going into the red zone and returning that must be signed off on by a supervisor.
Good Practices Observed in PBRI

- Training - Offshore Supervisors take an extra course for dropped object prevention/awareness.
Good Practices Observed in PBRI

- Data Trending - Information from dropped objects and dropped object good catch events is used to trend threats.
Good Practices Observed in PBRI

- **Drops Warrior Program** - Program consists of a different team member being selected each day. The person that is chosen has a specific area they inspect for any potential drops in the area. They document their findings on a card and turn it in to the HSE Advisor. The cards are tracked for the week, and a Drops Warrior for the Week is chosen and awarded during the Weekly Safety Meeting.
June 2021 HiPo Dropped Objects

- The drift (weighing 4 lbs) was not in the pin end of the joint of pipe and had fallen approximately 70 ft. and had landed inside of the red zone.

- The tool string was bumped up to the top of the lubricator causing the cable to pull out of the rope socket. The 47' long tool string assembly weighing 115 lbs fell 20’ to the rig floor.

- A strut grating 2'x6' walkover plate, weighing 30 pounds, fell approximately 134 feet from the dynamic subbase to the production hull deck.
Revisit Opening Remarks

- “I know.”

- “We are the best.”

- “Turn information into insight within your company, insight with your personnel, and insight in your operations.”
Questions & Answers
Join Us!

COS Annual Forum

October 27, 2021

Registration Information:  www.centerforoffshoresafety.org

• Spotlights on Excellence – finalists for the 2021 COS Safety Leadership Award

• Conversations with BSEE and USCG