Global experience

The International Association of Oil & Gas Producers has access to a wealth of technical knowledge and experience with its members operating around the world in many different terrains. We collate and distil this valuable knowledge for the industry to use as guidelines for good practice by individual members.

Consistent high quality database and guidelines

Our overall aim is to ensure a consistent approach to training, management and best practice throughout the world.

The oil and gas exploration and production industry recognises the need to develop consistent databases and records in certain fields. The OGP’s members are encouraged to use the guidelines as a starting point for their operations or to supplement their own policies and regulations which may apply locally.

Internationally recognised source of industry information

Many of our guidelines have been recognised and used by international authorities and safety and environmental bodies. Requests come from governments and non-government organisations around the world as well as from non-member companies.

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- Hess Corporation
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- INPEX
- Kuwait Oil Company
- Mærsk Oil
- Marathon
- MOL
- Nexen Inc
- Oil Search
- OMV
- Perenco
- Petrobras
- Petronas Carigali Sdn Bhd
- Premier Oil
- PTTEP
- Qatar Petroleum
- Rasgas
- Repsol
- Shell Companies
- Statoil
- Suncor
- Talisman Energy
- TNK-BP
- Total
- Tullow Oil
- Wintershall
- Woodside
- Yemen LNG
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Preface

The International Association of Oil & Gas Producers (OGP) has been collecting safety incident data from member companies globally since 1985. The data collected are entered into the OGP safety database, which is the largest database of safety performance in the E&P industry.

The principal purpose of the data collection and analysis is to record the global safety performance of the contributing OGP member companies, each year. The submission of data is voluntary and is not mandated by the OGP membership. The annual reports provide trend analysis, benchmarking and the identification of areas and activities on which efforts should be focused to bring about the greatest improvements in performance.

The OGP incident reporting system covers worldwide exploration and production (E&P) operations, both onshore and offshore, and includes incidents involving both member companies and their contractor employees.

The key indicators presented are: number of fatalities, total recordable injury rate, fatal accident rate, fatal incident rate, lost time injury frequency and restricted work day case + lost time injury frequency. The report presents contributing OGP members’ global results for these indicators, which are then analysed by region, function and company. A code is used to preserve the anonymity of the reporting company, which will typically report its own data as well as that of its associated contractors (see Appendix F).

Wherever practicable, results are presented graphically. The data underlying the charts are presented in Appendix B. The tables are organised according to the section in the report where the chart appears.

The main changes to the 2010 report are:

- Decommissioning has been added to the ‘Construction, Commissioning, Decommissioning’ activity for fatalities and Lost Work Day Cases.
- ‘Pressure release’ has been added as a separate category for Lost Work Day Cases.
- The ‘Unspecified’ function has been subject to analysis in this year’s report.
- The calculation method for rolling averages has been included.
- High potential events are now presented in Appendix D, replacing the ‘Significant incidents’ previously reported. High potential events are defined as “any incident or near miss that could have realistically resulted in one or more fatalities”.
- Additional definitions have been included in Appendix E to incorporate the requirements for future process safety event reporting.
- The basis for health leading performance indicators has been included in Appendix H.
- New ‘causal factor’ categories have been allocated to fatal incidents and high potential events. The causal factors are as follows (over):
People (acts)

Following procedures:
- Violation intentional (by individual or group)
- Violation unintentional (by individual or group)
- Improper position (in the line of fire)
- Overexertion or improper position/posture for task
- Work or motion at improper speed
- Improper lifting or loading

Use of tools, equipment, materials and products:
- Improper use/position of tools/equipment/materials/products
- Servicing of energized equipment/inadequate energy isolation
- Use of Protective Methods:
- Failure to warn of hazard
- Inadequate use of safety systems
- Personal Protective Equipment not used or used improperly
- Equipment or materials not secured
- Disabled or remove guards, warning systems or safety devices

Inattention/lack of awareness:
- Improper decision making or lack of judgment
- Lack of attention/distraeted by other concerns/stress
- Acts of violence
- Use of drugs or alcohol
- Fatigue

Process (conditions)

Protective Systems:
- Inadequate/defective guards or protective barriers
- Inadequate/defective Personal Protective Equipment
- Inadequate/defective warning systems/safety devices
- Inadequate security provisions or systems

Tools, equipment, materials, products:
- Inadequate design/specification or management of change
- Inadequate/defective tools/equipment/materials/products
- Inadequate maintenance/inspection/testing

Work place hazards:
- Congestion, clutter or restricted motion
- Inadequate surfaces, floors, walkways or roads
- Hazardous atmosphere (explosive/toxic/asphyxiating)
- Storms or acts of nature

Organisational:
- Inadequate training/competence
- Inadequate work standards/procedures
- Inadequate hazard identification or risk assessment
- Inadequate communication
- Inadequate supervision
- Poor leadership/organisational culture
- Failure to report/learn from incidents

These changes reflect the Safety Data Sub-Committee’s aim to improve the reliability of the data and its interpretation.
1 Summary

The OGP safety performance indicators report summarises the safety performance of contributing OGP member companies for 2010.

The key performance indicators (KPI) used to benchmark the safety performance of the industry are: number of fatalities, fatal accident and incident rates, total recordable injury rate, lost time injury frequency and restricted work day case + lost time injury frequency.

Third party fatalities are not included in this report.

1.1 General

The safety performance of contributing OGP member companies in 2010 is based on the analysis of 3,411 million work hours of data, 5% less than were reported in 2009. Submissions were made by 42 of the 53 operating company OGP members. All participating companies reported statistics for its contractors. The data reported cover operations in 102 countries.

- 74% of the hours reported were associated with onshore activities, 26% with offshore activities.
- Of the 42 companies, 41 had contributed data in 2009. Since these 41 accounted for 99% of the database in 2010, comparison of the year 2010 results with those of 2009 is legitimate and statistically meaningful. 39 of the companies submitting 2010 data had also provided data in 2008.
- 20 of the companies contributed 90% of the hours. 7 companies between them covered 52% of the hours, and the largest contributor accounted for 11%.
- 21% of the reported work hours were related to company personnel and 79% were related to contractors.

The overall results show a reduction in almost all injury KPIs.
1.2 Fatalities

Against the background of a 5% decrease in work hours reported, the number of fatalities has decreased from 99 in 2009 to 94 fatalities occurring in 58 separate incidents in 2010. The resulting Fatal Accident Rate (2.8) is the same as last year’s figure. The company and contractor FAR are 3.17 and 2.64 respectively. Onshore and offshore FAR are 2.62 and 3.16 respectively. Just over a third of the 2010 deaths were the result of two incidents: a fatal aircraft in Pakistan (21 fatalities) and a blowout and subsequent explosion and fire in the US Gulf of Mexico (11 fatalities).

This year the reporting categories are divided into ‘activity’ and ‘category’. The activity with the highest number of fatalities reported by the OGP member companies is ‘Air transport’ with 22 fatalities in 2 separate incidents. These included a Pakistan air transport incident involving a chartered aircraft that crashed immediately after taking off from the international airport, in which 15 company and 6 contractor employees lost their lives. There were 10 fatal incidents reported in the activity ‘Drilling, Workover, Well Services’ which resulted in 21 fatalities. These included a fire and explosion offshore in the USA in which 11 individuals lost their lives.

The number of deaths resulting from land transport incidents continues to fall. In 2008, 25% (26) of reported fatalities were categorised as ‘vehicle incidents’; this reduced to 10% (10 fatalities) in 2009 and has reduced again in 2010 to 9% (8 fatalities).

With regard to the incident category, excluding those reported as ‘Other’ (which included the two air transport incidents), the largest proportion (21%) of the fatalities reported in 2010 were the result of individuals being struck by falling or moving objects (23% in 2009). Excluding those categorised as ‘Other’, incidents categorised as ‘Explosions or Burns’ (15%) were the second greatest contributors to the statistics (4% in 2009). There has been a 10% increase in the ‘Assault and violent act’ category in 2010 (2% in 2009).

Similar to last year, 6% of the fatalities were the result of ‘Falls from height’ (8% in 2009), the category ‘Pressure release’ shows that 6 fatalities were caused by pressure related incidents, the same number as in 2009. In earlier years these were mostly reported under ‘Struck by’.
The Fatal Accident Rates for Asia/Australasia (4.14) and North America (5.08) are high compared with a global average of 2.76. This is mainly due to single fatal incidents with multiple fatalities in both regions.

The FIR is a measure of the frequency with which fatal incidents occur, in contrast to the FAR which measures the frequency of fatalities. Accordingly, the FIR will be less than or equal to the FAR. Comparison of FAR and FIR gives an indication of the magnitude of the incidents in terms of lives lost.

Overall the fatal incident rate has decreased by 9% compared with last year and is the lowest on record to date.
The rate for all recordable injuries (fatalities, lost work day cases, restricted work day cases and medical treatment cases) was 1.68 injuries per million hours worked (1.75 in 2009). This is a 4% reduction compared with 2009 with 547 fewer injuries reported than in 2009.

The 2010 TRIR is lowest on record for the overall result as well as the company, contractor, onshore and offshore results.

The two regions which showed the largest decrease in TRIR were Africa (17.8%) and South America (14.8%). The only regions where an increase in TRIR from 2009 to 2010 (both approximately 6%) were shown were the Middle East and Asia/Australasia. The Middle East work hours decreased by 33% in 2010 compared with 2009.
1.4 Lost time injuries

The overall Lost Time Injury Frequency (LTIF) decreased from 0.45 in 2009 to 0.42 in 2010. This represents a decrease of 7% compared with 2009, a reduction of 196 lost time injuries. It continues a long-term downward trend in the overall performance indicator.

This reduction is similar in both company and contractor performance. The company and contractor LTIF are now almost the same. Onshore and offshore LTIF have also shown a decrease from 2009 to 2010, all are the lowest on record to date.

There were 1,336 reported injuries resulting in at least one day off work, 1,065 incidents were contractor related and 271 were company related. This equates to an average of 26 such injuries every week of the year. Approximately 267 work-years (assuming 220 working days per year) are estimated to have been lost by reporting companies and their contractors as a result of injuries.

Although the absolute number of LWDCs has reduced (1,527 in 2009), the time away from work has increased. Offshore injuries result in a 33% higher number of lost work days than onshore. The severity of lost work day cases is the highest in the South American region compared with the other regions, with 98.5 days lost per LWDC in 2010. The South American average has more than doubled compared with a regional average of 36.7 days lost per LWDC for the previous 5-year period.

The lost work day case category was provided for all of the Lost Work Day Cases reported, although 10% of the cases were categorised as ‘Other’.

- With the exception of the ‘Other’ category, the greatest number of incidents was reported as ‘Struck by’ (347 cases accounting for 26% of the total; 2009 results showed 317 cases accounting for 20.8% of the total).
- ‘Caught in, under or between’ and ‘Slips and Trips (at the same height)’ both accounted for 17% of the total reported cases. 2009 results also showed 17% for both categories.

Lost work day case activities were reported for all of the 1,336 Lost Work Day Cases reported, although 9% of the cases were reported as ‘Unspecified-other’. In 2009, 22.9% were reported as ‘Unspecified-other’.

Pressure release was a new category for the 2010 Lost Work Day Case Data. ‘Production Operations’ was a new activity and ‘Decommissioning’ was added to ‘Construction, Commissioning, Decommissioning’ for 2010 data.
1.5 Restricted work day case + lost time injury (RWDC + LTI) frequency

The overall Restricted work day case + lost time injury (RWDC + LTI) frequency increased by 4% overall from 2009 to 2010. The figures show the frequency of RWDC and LTI for companies and contractors, and onshore and offshore activities. The frequency of RWDCs and lost time injuries remains higher in the offshore environment.
2 Overall results

In this section the primary indicators used to measure contributing OGP member companies’ safety performance are: the number and nature of fatalities, total recordable injury rate (TRIR), fatal accident rate (FAR), fatal incident rate (FIR), lost time injury frequency (LTIF) and restricted work day case + lost time injury frequency (RWDC+LTI).

Third party incidents are not included in this report.

2.1 Fatalities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>22 (12)</td>
<td>1 (1)</td>
<td>23 (13)</td>
</tr>
<tr>
<td>Contractor</td>
<td>44 (65)</td>
<td>27 (21)</td>
<td>71 (86)</td>
</tr>
<tr>
<td>Total</td>
<td>66 (77)</td>
<td>28 (22)</td>
<td>94 (99)</td>
</tr>
</tbody>
</table>

Company/contractor Fatalities

- 94 company and contractor fatalities were reported in 2010. This is 5 fewer than were reported in 2009 and 9 fewer than in 2008.
- The 94 fatalities occurred in 58 separate incidents.
- There were two incidents that involved more than two fatalities. These were:
  - A Pakistan air transport incident involving a chartered aircraft that crashed immediately after taking off from the international airport. Fifteen company and 6 contractor employees lost their lives.
  - A fire and explosion offshore in the USA in which 11 individuals lost their lives.
2.2  Total recordable injury rate (TRIR)

Total recordable injury rate – company & contractors
per million hours worked  (Data page B-2)

<table>
<thead>
<tr>
<th></th>
<th>2010 (2009) TRIR</th>
<th>Relative to 2009 TRIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>1.19 (1.28)</td>
<td>6% lower</td>
</tr>
<tr>
<td>Contractor</td>
<td>1.81 (1.89)</td>
<td>4% lower</td>
</tr>
<tr>
<td>Overall</td>
<td>1.68 (1.75)</td>
<td>4% lower</td>
</tr>
<tr>
<td>Onshore</td>
<td>1.41 (1.45)</td>
<td>3% lower</td>
</tr>
<tr>
<td>Offshore</td>
<td>2.45 (2.79)</td>
<td>12% lower</td>
</tr>
</tbody>
</table>

Submissions without information on medical treatment cases were filtered out, leaving a database of 3,398 million hours, almost 100% of the database (see Appendix A).

- A reduction can be seen in 2010 in all TRIR results, and they are the lowest on record to date.
2.3 Fatal accident rate (FAR)

- In 2010 there were 23 company related fatalities (13 in 2009). Fifteen of the company fatalities were as a result of the single air transport incident in Pakistan.
- In 2010 there were 71 contractor related fatalities (86 in 2009).
  - Eleven of the contractor fatalities were as a result of a single fire and explosion during offshore drilling activities in the USA.
  - Six of the contractor fatalities were as a result of the single air transport incident in Pakistan.
- The difference between the onshore and offshore FAR displays a large variation over the 10 year period shown. Neither is consistently lower. This is generally attributable to single incidents involving high numbers of fatalities.

<table>
<thead>
<tr>
<th></th>
<th>2010 (2009) FAR</th>
<th>Relative to 2009 FAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>3.17 (1.58)</td>
<td>101% higher</td>
</tr>
<tr>
<td>Contractor</td>
<td>2.64 (3.11)</td>
<td>15% lower</td>
</tr>
<tr>
<td>Overall</td>
<td>2.76 (2.76)</td>
<td>no change</td>
</tr>
<tr>
<td>Onshore</td>
<td>2.62 (2.75)</td>
<td>5% lower</td>
</tr>
<tr>
<td>Offshore</td>
<td>3.16 (2.78)</td>
<td>14% higher</td>
</tr>
</tbody>
</table>

Fatal accident rate (FAR)
The number of company/contractor fatalities per 100,000,000 (100 million) hours worked.
2.4 Fatal incident rate (FIR)

The FIR is a measure of the frequency with which fatal incidents occur, in contrast to the FAR which measures the frequency of fatalities. Accordingly, for company and contractor fatalities only, the FIR will be less than or equal to the FAR. Comparison of FAR and FIR gives an indication of the magnitude of the incidents in terms of lives lost.

- Overall the fatal incident rate has decreased by 9% compared with last year and is the lowest on record (58 fatal incidents in 2010, 63 fatal incidents in 2009).
- The company only fatal incident rate reduced by 10% compared with 2009 results. This is an actual reduction of 2 fatal incidents from 2009.

### Fatal incident rate (FIR)

The number of fatal incidents that result in one or more fatalities per 100,000,000 (100 million) hours worked.

<table>
<thead>
<tr>
<th></th>
<th>2010 (2009) FIR</th>
<th>Relative to 2009 FIR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company</strong></td>
<td>1.10 (1.22)</td>
<td>10% lower</td>
</tr>
<tr>
<td><strong>Contractor</strong></td>
<td>1.86 (2.06)</td>
<td>10% lower</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>1.70 (1.87)</td>
<td>9% lower</td>
</tr>
<tr>
<td><strong>Onshore</strong></td>
<td>1.70 (1.86)</td>
<td>9% lower</td>
</tr>
<tr>
<td><strong>Offshore</strong></td>
<td>1.69 (1.90)</td>
<td>11% lower</td>
</tr>
</tbody>
</table>

The number of fatal incidents that result in one or more fatalities per 100,000,000 (100 million) hours worked.
2.5 Fatalities by incident category and activity

- Twenty two of the fatalities categorised as ‘Other’ were as a result of 2 air transport incidents which resulted in 22 fatalities. (‘Other’ was 27% in 2009).
- Excluding those categorised as ‘Other’, the largest proportion of the fatalities reported in 2010 were the result of individuals being struck by falling or moving objects. (‘Struck by’ was 23% in 2009).
- Excluding those categorised as ‘Other’, incidents categorised as ‘Explosions or Burns’ were the second greatest contributors to the fatality statistics. (4% in 2009).
- There has been an increase in the category ‘Assault and violent act’ (2% in 2009).
- A reduction is seen in the number of deaths resulting from land transport incidents (8 fatalities) compared with previous years (10 fatalities in 2009, 26 in 2008).
- There were 10 fatal incidents reported in the activity ‘Drilling, Workover, Well Services’ which resulted in 21 fatalities.
- 50 of the fatal incidents involved one fatality.
- Incidents which involved 2 fatalities were reported under the categories:
  - Assault and violent act (2 incidents).
  - Water related, drowning (1 incident).
  - Struck by (2 incidents).
  - Explosion burn (1 incident).
- There were no fatal incidents reported under the following categories:
  - Cut, Puncture, Scrape.
  - Exposure Noise, Chemical, Biological, Vibration.
  - Overexertion, Strain.
  - Slips, Trips, Falls (at same height).

‘Production Operations’ was a new activity and decommissioning was added to ‘Construction, Commissioning, Decommissioning’ for 2010 data.
## Fatalities – by incident category and activity, 2010

<table>
<thead>
<tr>
<th>Incident Category</th>
<th>Assault or violent act</th>
<th>Caught in, under or between</th>
<th>Confined space</th>
<th>Explosion or burns</th>
<th>Exposure electrical</th>
<th>Falls from height</th>
<th>Pressure release</th>
<th>Struck by</th>
<th>Water related, drowning</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction, commissioning, decommissioning</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Diving, subsea, ROV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Drilling, workover, well services</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Lifting, crane, rigging, deck operations</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Maintenance, inspection, testing</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Office, warehouse, accommodation, catering</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Production operations</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Seismic/survey operations</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Transport – air</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Transport – land</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Transport – water, including marine activity</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Unspecified – other</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
<td><strong>1</strong></td>
<td><strong>14</strong></td>
<td><strong>2</strong></td>
<td><strong>6</strong></td>
<td><strong>6</strong></td>
<td><strong>20</strong></td>
<td><strong>4</strong></td>
<td><strong>23</strong></td>
<td><strong>94</strong></td>
</tr>
</tbody>
</table>
2.6 Lost time injury frequency (LTIF)

<table>
<thead>
<tr>
<th></th>
<th>2010 (2009) LTIF</th>
<th>Relative to 2009 LTIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>0.41 (0.44)</td>
<td>7% lower</td>
</tr>
<tr>
<td>Contractor</td>
<td>0.42 (0.46)</td>
<td>9% lower</td>
</tr>
<tr>
<td>Overall</td>
<td>0.42 (0.45)</td>
<td>7% lower</td>
</tr>
<tr>
<td>Onshore</td>
<td>0.35 (0.38)</td>
<td>8% lower</td>
</tr>
<tr>
<td>Offshore</td>
<td>0.62 (0.70)</td>
<td>11% lower</td>
</tr>
</tbody>
</table>

- The overall LTIF decreased by 7% from 0.45 in 2009 to 0.42 in 2010 and is the lowest LTIF recorded to date.

There were 1,336 reported lost work day cases resulting in at least one day off work, which equates to an average of 26 injuries resulting in at least one day off work every week of the year. Approximately 267 work-years are estimated to have been lost by reporting companies and their contractors (assuming 220 working days per year) as a result of injuries. Although the absolute number of LWDCs has reduced (1,527 in 2009), the time away from work has increased, hence in 2009 only 260 work-years were lost. See Section 2.8 for further information on Lost Work Day Case severity.
2.7 Lost work day cases by category and activity

Lost Work Day Cases by category

<table>
<thead>
<tr>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assault or violent act</td>
<td>14 1.0</td>
</tr>
<tr>
<td>Caught in, under or between</td>
<td>228 17.1</td>
</tr>
<tr>
<td>Confined space</td>
<td>1 0.1</td>
</tr>
<tr>
<td>Cut, puncture, scrape</td>
<td>55 4.1</td>
</tr>
<tr>
<td>Explosion or burns</td>
<td>66 4.9</td>
</tr>
<tr>
<td>Exposure electrical</td>
<td>16 1.2</td>
</tr>
<tr>
<td>Exposure noise, chemical, biological, vibration</td>
<td>27 2.0</td>
</tr>
<tr>
<td>Falls from height</td>
<td>137 10.3</td>
</tr>
<tr>
<td>Overexertion, strain</td>
<td>75 5.6</td>
</tr>
<tr>
<td>Pressure release</td>
<td>5 0.4</td>
</tr>
<tr>
<td>Slips and trips (at same height)</td>
<td>232 17.4</td>
</tr>
<tr>
<td>Struck by</td>
<td>347 26.0</td>
</tr>
<tr>
<td>Water related, drowning</td>
<td>3 0.2</td>
</tr>
<tr>
<td>Other</td>
<td>130 9.7</td>
</tr>
<tr>
<td>Total</td>
<td>1,336</td>
</tr>
</tbody>
</table>

Of the 1,336 reported lost work day cases resulting in at least one day off work, 1065 incidents were contractor related and 271 were company related.

Lost work day case category was provided for all of the Lost Work Day Cases reported, although 10% of the cases were categorised as ‘Other’.

The pie chart shows the percentage of LWDCs within each of the reporting categories for 2010.

- With the exception of the ‘Other’ category, the greatest number of incidents was reported as ‘Struck by’ (347 cases accounting for 26%), (2009 results showed 317 cases accounting for 20.8%).
- ‘Caught in, under or between’ and ‘Slips and Trips (at the same height)’ both accounted for 17% of the total reported cases. (2009 results also showed 17% for both categories).

Pressure release was a new category for the 2010 Lost Work Day Case Data.
Lost Work Day Cases by activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction, commissioning, decommissioning</td>
<td>158</td>
<td>11.8</td>
</tr>
<tr>
<td>Diving, subsea, ROV</td>
<td>7</td>
<td>0.5</td>
</tr>
<tr>
<td>Drilling, workover, well services</td>
<td>315</td>
<td>23.6</td>
</tr>
<tr>
<td>Lifting, crane, rigging, deck operations</td>
<td>88</td>
<td>6.6</td>
</tr>
<tr>
<td>Maintenance, inspection, testing</td>
<td>218</td>
<td>16.3</td>
</tr>
<tr>
<td>Office, warehouse, accommodation, catering</td>
<td>95</td>
<td>7.1</td>
</tr>
<tr>
<td>Production operations</td>
<td>146</td>
<td>10.9</td>
</tr>
<tr>
<td>Seismic/survey operations</td>
<td>26</td>
<td>1.9</td>
</tr>
<tr>
<td>Transport – air</td>
<td>13</td>
<td>1.0</td>
</tr>
<tr>
<td>Transport – land</td>
<td>101</td>
<td>7.6</td>
</tr>
<tr>
<td>Transport – water, including marine activity</td>
<td>49</td>
<td>3.7</td>
</tr>
<tr>
<td>Unspecified – other</td>
<td>120</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,336</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Lost work day case activities were reported for all of the 1,336 Lost Work Day Cases reported, although 9% of the cases were reported as ‘Unspecified-other’. In 2009 22.9% were reported as ‘Unspecified-other’.

‘Production Operations’ was a new activity and decommissioning was added to ‘Construction, Commissioning, Decommissioning’ for 2010 data.
Of the 1,336 reported lost work day cases resulting in at least one day off work, 271 were company related and 1065 incidents were contractor related. Pressure release was a new category for the 2010 Lost Work Day Case Data.
Loss Work Day Cases by category – onshore & offshore

<table>
<thead>
<tr>
<th>Category</th>
<th>Onshore</th>
<th>Offshore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assault or violent act</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Caught in, under or between</td>
<td>117</td>
<td>111</td>
</tr>
<tr>
<td>Confined space</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cut, puncture, scrape</td>
<td>37</td>
<td>18</td>
</tr>
<tr>
<td>Explosion or burns</td>
<td>47</td>
<td>19</td>
</tr>
<tr>
<td>Exposure electrical</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Exposure noise, chemical, biological, vibration</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Falls from height</td>
<td>92</td>
<td>45</td>
</tr>
<tr>
<td>Overexertion, strain</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>Pressure release</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Slips and trips (at same height)</td>
<td>141</td>
<td>91</td>
</tr>
<tr>
<td>Struck by</td>
<td>207</td>
<td>140</td>
</tr>
<tr>
<td>Water related, drowning</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>92</td>
<td>38</td>
</tr>
</tbody>
</table>

Of the 1,336 reported lost work day cases resulting in at least one day off work, 813 incidents were onshore related and 523 were offshore related.

Pressure release was a new category for the 2010 Lost Work Day Case Data.
Of the 1,336 reported lost work day cases resulting in at least one day off work, 271 were company related and 1065 incidents were contractor related.

Lost Work Day Case by activity results for 2010 were very similar to the 2009 results with the exception of ‘Unspecified-other’ which reduced from 45% in 2009 to 10% for Company related, and from 16% to 9% for contractor related Lost Work Day Cases.

‘Production Operations’ was a new activity and decommissioning was added to ‘Construction, Commissioning, Decommissioning’ for 2010 data.
Of the 1,336 reported lost work day cases resulting in at least one day off work, 813 incidents were onshore related and 523 were offshore related.

Lost Work Day Case by activity results for 2010 were very similar to the 2009 results with the exception of ‘Unspecified-other’ which reduced from 26% in 2009 to 10% for onshore related, and from 17% to 8% for contractor related Lost Work Day Cases.

‘Production Operations’ was a new activity and decommissioning was added to ‘Construction, Commissioning, Decommissioning’ for 2010 data.

Lost Work Day Cases by activity – onshore & offshore

<table>
<thead>
<tr>
<th>Activity</th>
<th>Onshore</th>
<th>Offshore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction, commissioning, decommissioning</td>
<td>100</td>
<td>58</td>
</tr>
<tr>
<td>Diving, subsea, ROV</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Drilling, workover, well services</td>
<td>194</td>
<td>121</td>
</tr>
<tr>
<td>Lifting, crane, rigging, deck operations</td>
<td>33</td>
<td>55</td>
</tr>
<tr>
<td>Maintenance, inspection, testing</td>
<td>104</td>
<td>114</td>
</tr>
<tr>
<td>Office, warehouse, accommodation, catering</td>
<td>73</td>
<td>22</td>
</tr>
<tr>
<td>Production operations</td>
<td>93</td>
<td>53</td>
</tr>
<tr>
<td>Seismic/survey operations</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>Transport – air</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Transport – land</td>
<td>98</td>
<td>3</td>
</tr>
<tr>
<td>Transport – water, including marine activity</td>
<td>12</td>
<td>37</td>
</tr>
<tr>
<td>Unspecified – other</td>
<td>78</td>
<td>42</td>
</tr>
</tbody>
</table>
2.8 Severity of lost work day cases

Severity – company & contractors
average days lost per LWDC (Data page B-4)

Severity – onshore & offshore
average days lost per LWDC (Data page B-4)

- OGP member companies reported 1,336 LDWCs of which 1,037 LWDCs specified the number of lost work days. The actual number of lost work days reported was 45,524, which equates to around 267 work-years of activity.

- The number of days lost was reported for 80% of the lost work day cases.

- The difference between company and contractor severity levels remains at 8%.

- The offshore LWDC severity is 33% higher than onshore.

Severity is defined as the average number of days lost (where reported) for each lost work day case.
The figures below show the average number of days lost per LWDC in 2010 compared with the average for the previous 5-year period. An increase is shown in LWDC severity in all areas of activity compared with the average over the previous 5 year period, an increase of 47% overall.
2.9 Restricted work day case + lost time injury (RWDC + LTI) frequency

**RWDC + LTI frequency – company & contractor**

<table>
<thead>
<tr>
<th>Year</th>
<th>2010 (2009) RWDC+LTIF</th>
<th>Relative to 2009 RWDC+LTIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>0.60 (0.65)</td>
<td>8% lower</td>
</tr>
<tr>
<td>Contractor</td>
<td>0.93 (0.88)</td>
<td>6% higher</td>
</tr>
<tr>
<td>Overall</td>
<td>0.86 (0.83)</td>
<td>4% higher</td>
</tr>
<tr>
<td>Onshore</td>
<td>0.71 (0.66)</td>
<td>8% higher</td>
</tr>
<tr>
<td>Offshore</td>
<td>1.32 (1.43)</td>
<td>8% lower</td>
</tr>
</tbody>
</table>

The figures show the frequency of RWDC + LTI for companies and contractors, and onshore and offshore activities. Submissions without information on restricted work days were filtered out, leaving a database of 3,278 million hours, 96% of the total database.

- The frequency of RWDCs + LTIs remains higher in the offshore environment.

**RWDC + LTI frequency – onshore & offshore**

**Restricted work day cases (RWDC)**

RWDCs are occupational injuries which are severe enough to prevent a person from performing normal duties, but not so severe that lighter duties cannot be performed.

**RWDC+LTI frequency**

The number of restricted work day cases plus the number of lost time injuries (fatalities + lost work day cases) per 1,000,000 hours worked.
2.10  Severity of restricted work day cases

A total of 7,909 days were restricted (RWDC days) as a result of restricted work day cases, in the sense that normal duties could not be performed. This compares with 45,524 days lost (LWDC days) on a 44% larger database.

- The average number of days lost to restricted work per case increased compared with the average for the previous 5-year period, most noticeably in onshore operations (15%).

- The number of days lost among contractor staff has risen in line with the number of days lost overall by 11% compared with the average for the previous 5-year period. Both remain unchanged compared with 2009 results.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>14.72 (15.26)</td>
<td>4% lower</td>
<td>3% higher</td>
</tr>
<tr>
<td>Contractor</td>
<td>13.78 (13.80)</td>
<td>&lt;1% lower</td>
<td>11% higher</td>
</tr>
<tr>
<td>Overall</td>
<td>13.88 (13.94)</td>
<td>&lt;1% lower</td>
<td>11% higher</td>
</tr>
<tr>
<td>Onshore</td>
<td>13.59 (12.42)</td>
<td>9% higher</td>
<td>15% higher</td>
</tr>
<tr>
<td>Offshore</td>
<td>14.35 (15.75)</td>
<td>9% lower</td>
<td>1% higher</td>
</tr>
</tbody>
</table>

Severity of restricted work day cases – company & contractor average days lost per RWDC [Data page B.5]

Severity of restricted work day cases– onshore & offshore average days lost per RWDC [Data page B.5]
The figures here show the average number of days lost per RWDC in 2010 compared with the average for the previous 5-year period. An increase is shown in RWDC severity in all areas of activity compared with the previous 5-year period – an increase of 11% overall.
2.11 Incident triangles

In this section the relative numbers of types of occupational injury are shown in the form of 'accident triangles'. The ratios have been corrected to account for the absence, in some returns, of medical treatment cases.

### 2010 incident triangles

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Companies</th>
<th>Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lost time injuries</strong></td>
<td>1</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td><strong>Recordable injuries</strong></td>
<td>60</td>
<td>37</td>
<td>68</td>
</tr>
</tbody>
</table>

- **Overall**: 1 fatality, 16 lost time injuries, 60 recordable injuries.
- **Companies**: 1 fatality, 12 lost time injuries, 37 recordable injuries.
- **Contractors**: 1 fatality, 14 lost time injuries, 60 recordable injuries.

### 2009 incident triangles

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Companies</th>
<th>Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lost time injuries</strong></td>
<td>1</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td><strong>Recordable injuries</strong></td>
<td>63</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

- **Overall**: 1 fatality, 16 lost time injuries, 63 recordable injuries.
- **Companies**: 1 fatality, 27 lost time injuries, 80 recordable injuries.
- **Contractors**: 1 fatality, 14 lost time injuries, 60 recordable injuries.

### Recordable injuries
- Fatalities, lost work day cases, restricted work day cases and medical treatment cases.

### Lost time injuries
- Lost work day cases and fatalities

### Ratios of injuries

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio of lost time injuries to fatalities</th>
<th>Ratio of total recordable injuries to lost time injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>15:1</td>
<td>4:1</td>
</tr>
<tr>
<td>2009</td>
<td>16:1</td>
<td>4:1</td>
</tr>
<tr>
<td>2008</td>
<td>17:1</td>
<td>4:1</td>
</tr>
<tr>
<td>2007</td>
<td>22:1</td>
<td>4:1</td>
</tr>
</tbody>
</table>
2.12 Causal factors analysis

One of the changes to the 2010 data submission was the request to allocate ‘causal factors’ to fatal incidents and high potential events. To standardise the response an OGP list of causal factors and a glossary was provided to the member companies as part of the 2010 User Guide. The causal factors list is divided into two sections, the full list is included in the Preface to this document (page v):

- People (Acts) classifications usually involve either the actions of a person or actions which were required but not carried out or were incorrectly performed. There are four major categories of actions, with an additional level of detail under each of the major categories.
- Process (Conditions) classifications usually involve some type of physical hazard or organizational aspect out with the control of the individual. There are five major classification categories, with an additional level of detail under each of the major categories.

2.12.1 Fatal Incident Causal Factors

- 51 of the 58 fatal incidents reported were assigned causal factors
- 242 causal factors were assigned for the 51 fatal incidents
  - 109 were People (Acts)
  - 133 were Process (Conditions)
- Between 1 and 18 causal factors were assigned per incident.

The top 10 causal factors assigned to fatal incidents were:

<table>
<thead>
<tr>
<th>Causal Factor assigned for Fatal Incidents</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process (Conditions): Organisational – Inadequate hazard identification or risk assessment</td>
<td>30</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate supervision</td>
<td>18</td>
</tr>
<tr>
<td>People (Acts): Following Procedures – Improper position (in the line of fire)</td>
<td>16</td>
</tr>
<tr>
<td>People (Acts): Inattention/Lack of Awareness – Improper decision making or lack of judgment</td>
<td>14</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate training/competence</td>
<td>13</td>
</tr>
<tr>
<td>People (Acts): Following Procedures – Violation intentional (by individual or group)</td>
<td>12</td>
</tr>
<tr>
<td>People (Acts): Following Procedures – Violation unintentional (by individual or group)</td>
<td>12</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate communication</td>
<td>12</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate work standards/procedures</td>
<td>10</td>
</tr>
<tr>
<td>Process (Conditions): Tools, Equipment, Materials &amp; Products – Inadequate design/specification/management of change</td>
<td>10</td>
</tr>
</tbody>
</table>

Appendix C provides additional information on the fatal incidents reported by region, the information provided includes a narrative description of the incident, the corrective actions and recommendations and the causal factors assigned by the reporting company.
2.12.2 High Potential Event Causal Factors

- 97 of the 98 high potential incidents were assigned causal factors
- 400 causal factors were assigned for the 98 HiPo incidents
  - 134 were People (Acts)
  - 266 were Process (Conditions)
- Between 1 and 11 causal factors were assigned per event

<table>
<thead>
<tr>
<th>Causal Factor assigned for High Potential Incidents</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process (Conditions): Organisational – Inadequate hazard identification or risk assessment</td>
<td>47</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate work standards/procedures</td>
<td>37</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate supervision</td>
<td>31</td>
</tr>
<tr>
<td>People (Acts): Following Procedures – Violation unintentional (by individual or group)</td>
<td>27</td>
</tr>
<tr>
<td>People (Acts): Inattention/Lack of Awareness – Improper decision making or lack of judgment</td>
<td>23</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate training/competence</td>
<td>22</td>
</tr>
<tr>
<td>Process (Conditions): Tools, Equipment, Materials &amp; Products – Inadequate maintenance/inspection/testing</td>
<td>21</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Inadequate communication</td>
<td>19</td>
</tr>
<tr>
<td>Process (Conditions): Organisational – Poor leadership/organisational culture</td>
<td>15</td>
</tr>
</tbody>
</table>

Appendix D provides additional information of the high potential event reported by region, the information provided includes a narrative description of the event, the corrective actions and recommendations and the causal factors assigned by the reporting company.
3 Results by region

In this section the safety performance of regions and individual countries within the regions are presented. A list of countries from which companies have reported information is provided in Appendix G, which also shows the division of countries into regions.

Regions and countries throughout the Safety performance indicators are grouped in the same geographic regions as have been historically used in this report so as to ensure consistency;

3.1 Fatalities

The table shows the number of fatal incidents and fatalities in each of the 7 regions into which the data are partitioned. Further analysis of the fatality statistics is presented in Section 3.4, where 5-year rolling averages of FAR are presented for each of the regions.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>15 (10)</td>
<td>19 (12)</td>
<td>3.38 (2.21)</td>
<td>2.67 (1.84)</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>10 (11)</td>
<td>30 (11)</td>
<td>4.14 (1.58)</td>
<td>1.38 (1.58)</td>
</tr>
<tr>
<td>Europe</td>
<td>2 (6)</td>
<td>3 (21)</td>
<td>0.97 (6.58)</td>
<td>0.65 (1.88)</td>
</tr>
<tr>
<td>FSU</td>
<td>10 (9)</td>
<td>10 (11)</td>
<td>2.17 (3.14)</td>
<td>2.17 (2.57)</td>
</tr>
<tr>
<td>Middle East</td>
<td>11 (18)</td>
<td>11 (22)</td>
<td>1.63 (2.16)</td>
<td>1.63 (1.77)</td>
</tr>
<tr>
<td>North America</td>
<td>5 (7)</td>
<td>15 (14)</td>
<td>5.08 (4.37)</td>
<td>1.69 (2.18)</td>
</tr>
<tr>
<td>South America</td>
<td>5 (6)</td>
<td>6 (8)</td>
<td>1.57 (2.37)</td>
<td>1.31 (1.78)</td>
</tr>
</tbody>
</table>
3.2 Total recordable injury rate (TRIR)

Submissions without information on medical treatment cases were filtered out, leaving a database of 3,398 million hours, almost 100% of the database (see Appendix A).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>1.40</td>
<td>1.65</td>
<td>2.18</td>
<td>1.96</td>
<td>2.90</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>1.30</td>
<td>1.22</td>
<td>1.34</td>
<td>1.43</td>
<td>1.57</td>
</tr>
<tr>
<td>Europe</td>
<td>3.05</td>
<td>3.48</td>
<td>3.89</td>
<td>4.10</td>
<td>5.67</td>
</tr>
<tr>
<td>FSU</td>
<td>1.08</td>
<td>1.21</td>
<td>1.22</td>
<td>3.22</td>
<td>1.76</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.98</td>
<td>0.92</td>
<td>0.83</td>
<td>2.06</td>
<td>2.26</td>
</tr>
<tr>
<td>North America</td>
<td>2.89</td>
<td>3.08</td>
<td>4.25</td>
<td>4.53</td>
<td>5.28</td>
</tr>
<tr>
<td>South America</td>
<td>2.76</td>
<td>3.17</td>
<td>3.15</td>
<td>3.31</td>
<td>3.47</td>
</tr>
<tr>
<td>Overall</td>
<td>1.68</td>
<td>1.75</td>
<td>2.09</td>
<td>2.68</td>
<td>2.92</td>
</tr>
</tbody>
</table>

Further analysis of the lost time injuries is presented in Section 3.4, where 5-year rolling averages of LTIF are presented for each of the regions.

3.3 Lost time injury frequency (LTIF)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>0.36</td>
<td>0.42</td>
<td>0.61</td>
<td>0.64</td>
<td>0.66</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>0.29</td>
<td>0.29</td>
<td>0.29</td>
<td>0.27</td>
<td>0.36</td>
</tr>
<tr>
<td>Europe</td>
<td>1.06</td>
<td>1.31</td>
<td>1.38</td>
<td>1.40</td>
<td>1.65</td>
</tr>
<tr>
<td>FSU</td>
<td>0.31</td>
<td>0.35</td>
<td>0.45</td>
<td>0.57</td>
<td>0.78</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.25</td>
<td>0.26</td>
<td>0.29</td>
<td>0.50</td>
<td>0.68</td>
</tr>
<tr>
<td>North America</td>
<td>0.48</td>
<td>0.51</td>
<td>0.55</td>
<td>0.68</td>
<td>0.85</td>
</tr>
<tr>
<td>South America</td>
<td>0.61</td>
<td>0.69</td>
<td>0.90</td>
<td>1.08</td>
<td>2.08</td>
</tr>
<tr>
<td>Overall</td>
<td>0.42</td>
<td>0.45</td>
<td>0.55</td>
<td>0.66</td>
<td>0.99</td>
</tr>
</tbody>
</table>
3.4 FAR, TRIR and LTIF – 5-year rolling averages

The five year rolling average is calculated by summing the total number of incidents of the five previous years, and dividing by the sum of the work hours for these years. For example, the five year rolling average for 2010 is calculated by:

\[
\text{FAR}_{2010} = \frac{\text{Number of injuries in } 2006+2007+2008+2009+2010}{\text{Total work hours in } 2006+2007+2008+2009+2010}
\]

The number series involved in the calculation is frame shifted along by one each year, e.g. 2011 will calculate from 2007-2011.

In order to smooth out variability in the annual values of the regional TRIR, FAR and LTIF, 5-year rolling averages are computed which should provide a more reliable indicator of performance trends.

The figures show TRIR, FAR and LTIF 5-year rolling averages for each of the seven regions, and includes the 'all regions' curve.
3.5 Severity of lost work day cases

The number of days lost was reported for 78% (1,037 of 1,336) of lost work day cases.

The severity of lost work day cases is the highest in the South American region compared with the other regions, with 98.5 days lost per LWDC in 2010. The South American average has more than doubled compared with a regional average of 36.7 days lost per LWDC for the previous 5-year period.

---

Lost Work Day Case (LWDC)
A Lost Work Day Case is an incident resulting in at least one day off work. Fatal incidents are not included.

Severity
Severity is defined as the average number of days lost (where reported) for each lost work day case.
3.6 Restricted work day case + lost time injury (RWDC + LTI) frequency

<table>
<thead>
<tr>
<th></th>
<th>RWDC+LTI Frequency</th>
<th>Relative to 2005-2009 average RWDC+LTI frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>0.73</td>
<td>24% lower</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>0.73</td>
<td>12% higher</td>
</tr>
<tr>
<td>Europe</td>
<td>1.70</td>
<td>19% lower</td>
</tr>
<tr>
<td>FSU</td>
<td>0.41</td>
<td>45% lower</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.45</td>
<td>38% lower</td>
</tr>
<tr>
<td>North America</td>
<td>1.37</td>
<td>32% lower</td>
</tr>
<tr>
<td>South America</td>
<td>1.44</td>
<td>24% lower</td>
</tr>
<tr>
<td>Overall</td>
<td>0.86</td>
<td>25% lower</td>
</tr>
</tbody>
</table>

- For comparison the 2009 average for all regions was 0.83 (0.86 in 2010).

3.7 Individual country performance

The safety performance reported by participating OGP member companies of individual countries is presented in terms of the lost time injury frequency of companies jointly with contractors. To preserve the anonymity of companies, performance is only published for those countries for which at least 2 companies have reported statistics. Countries with less than 50,000 reported hours worked are excluded, since results for such small populations of hours would be unrepresentative. Overall averages and regional averages include data from all countries regardless of work hours or number of contributing companies.

Of the 102 countries from which data have been reported, 30 are excluded by these constraints.

The chart of relative performance for the remaining 72 countries compares the 2010 performance with that of 2009 and 2008.

The majority of countries in Asia/Australasia, FSU and the Middle East achieved an LTIF equal to or lower than the overall average LTIF (0.42). The majority of countries in Africa, Europe, North America and South America show an LTIF higher than the global average.

For comparison, the 5-year average FAR is shown for each of the regions. There appears to be little if any correlation between these values and the regional average LTIF values.
Lost time injury frequency – companies with contractors
per million hours worked [Data from B-8]

- Africa
  - Tansania
  - Mauritania
  - Tunisia
  - Cameroon
  - Ghana
  - Algeria
  - Gabon
  - DR Congo
  - Libya
  - Equatorial Guinea
  - Egypt
  - Nigeria
  - Angola
  - Congo
  - Madagascar
  - Mozambique

- Asia-Australasia
  - New Zealand
  - Philippines
  - Pakistan
  - Australia
  - Papua New Guinea
  - Vietnam
  - India
  - Myanmar
  - Thailand
  - China
  - Malaysia
  - Singapore
  - Indonesia
  - Bangladesh
  - Cambodia
  - Japan
  - South Korea

- Europe
  - Italy
  - Denmark
  - Norway
  - Hungary
  - UK
  - Netherlands
  - France
  - Romania
  - Ireland
  - Germany
  - Sweden
  - Poland

- FSU
  - Kazakhstan
  - Russia
  - Turkmenistan
  - Azerbaijan

- Middle East
  - Iraq
  - Iran
  - Yemen
  - Syria
  - UAE
  - Kuwait
  - Qatar
  - Saudi Arabia
  - Oman
  - Turkey
  - Jordan

- North America
  - USA
  - Canada
  - Mexico
  - Cuba

- South America
  - Peru
  - Colombia
  - Argentina
  - Brazil
  - Trinidad & Tobago
  - Venezuela
  - Ecuador
  - Bolivia

- Regional average LTIF
  - 5-year rolling average FAR
  - One or more fatalities (2010) – country listed in red

- Global average LTIF (2010): 0.46

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4 Results by function

In this section the safety performance within different functions performed in the E&P industry is presented. Functions are defined as ‘exploration’, ‘drilling’, ‘production’, ‘construction’ and ‘unspecified’. The category ‘other’ is no longer in use. See the Glossary of Terms at Appendix E for definitions.

4.1 Fatalities

The distribution of company and contractor fatal incidents and fatalities between the functions is shown in the table for both 2010 and 2009.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>1</td>
<td>1</td>
<td>Exploration</td>
<td>2</td>
</tr>
<tr>
<td>Drilling</td>
<td>22</td>
<td>33</td>
<td>Drilling</td>
<td>15</td>
</tr>
<tr>
<td>Production</td>
<td>17</td>
<td>20</td>
<td>Production</td>
<td>20</td>
</tr>
<tr>
<td>Construction</td>
<td>10</td>
<td>10</td>
<td>Construction</td>
<td>14</td>
</tr>
<tr>
<td>Unspecified</td>
<td>8</td>
<td>30</td>
<td>Unspecified</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>94</td>
<td>Total</td>
<td>67</td>
</tr>
</tbody>
</table>

The function ‘unspecified’ has been included in the analysis for the first time. The percentage of work hours reported under each function has been detailed below. See Appendix B for further data.

<table>
<thead>
<tr>
<th>Function</th>
<th>% of 2010 work hours</th>
<th>% of 2009 work hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Drilling</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Production</td>
<td>28</td>
<td>26</td>
</tr>
<tr>
<td>Construction</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Unspecified</td>
<td>29</td>
<td>32</td>
</tr>
</tbody>
</table>
4.2 Fatal accident rate (FAR) – 3-year rolling average

The three year rolling average is calculated by summing the total number of incidents of the three previous years, and dividing by the sum of the work hours for these years. For example, the three year rolling average for 2010 is calculated by:

\[
\text{FAR for 2010} = \frac{\text{Number of fatalities in drilling function 2008+2009+2010}}{\text{Total work hours in drilling 2008+2009+2010}}
\]

The number series involved in the calculation is frame shifted along by one each year, e.g. 2011 will calculate from 2009-2011.

In order to smooth out variability in the annual fatal accident rate values 3-year rolling averages are presented. These should provide a more reliable indicator of performance trends.

In this section, 3 year rolling averages are used rather than 5 year rolling averages, as the function ‘other’ was replaced by ‘construction’ for the first time in 2006.

The increase in the 2010 Drilling FAR can be attributed to the effect of a fire and explosion offshore in the USA in which 11 individuals lost their lives.

Note: The function ‘other’ was replaced by ‘construction’ for the first time in 2006, thus 2006 and 2007 3-year rolling average figures for those functions are not available.
4.3 Total recordable injury rate (TRIR)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>2.30</td>
<td>2.31</td>
<td>3.81</td>
<td>2.66</td>
<td>2.66</td>
</tr>
<tr>
<td>Production</td>
<td>2.14</td>
<td>2.32</td>
<td>2.64</td>
<td>3.03</td>
<td>3.27</td>
</tr>
<tr>
<td>Drilling</td>
<td>2.94</td>
<td>3.81</td>
<td>4.63</td>
<td>5.34</td>
<td>5.17</td>
</tr>
<tr>
<td>Construction</td>
<td>0.99</td>
<td>0.78</td>
<td>1.00</td>
<td>1.62</td>
<td>2.62</td>
</tr>
<tr>
<td>Unspecified</td>
<td>1.13</td>
<td>1.53</td>
<td>1.72</td>
<td>2.23</td>
<td>2.26</td>
</tr>
<tr>
<td>All functions</td>
<td>1.68</td>
<td>1.75</td>
<td>2.09</td>
<td>2.68</td>
<td>2.92</td>
</tr>
</tbody>
</table>

Submissions without information on medical treatment cases were filtered out, leaving a database of 3,398 million hours, almost 100% of the database (see Appendix A).

The number of work hours related to construction activities has decreased by 20% from 1,076 million in 2009 to 870 million in 2010.

4.4 Lost time injury frequency (LTIF) – 3-year rolling average

Note: The function ‘other’ was replaced by ‘construction’ for the first time in 2006, thus 2006-2007 3-year rolling average figures for those functions are not available.
4.5 **Severity of lost work day cases**

The 2010 average number of days lost per Lost Work Day Case (LWDC) offshore is 52.6 days compared with 39.4 days for onshore activities. See Section 2.8 for additional information and Section 3.5 for LWDC severity by region.

*Note: The category 'construction' was only introduced in 2006 thus 2010 data are compared with the 4-year average (2006-2009).*

4.6 **RWDC + LTI frequency by function**

The figure shows the frequency of RWDC and LTI associated with the different functions.

- A reduction of 25% can be seen in the overall RWDC+LTI frequency relative to the average for the previous 5-year period (1.14).
- The RWDC+LTI frequency has reduced for all functions, particularly for the 'Drilling' function which, in 2010, is 36% lower than the 2005-2009 average (2.55).
- For comparison, the 2009 average for all functions was 0.83.

Although the frequency of RWDC + LTI has decreased, the number of days lost per case has increased.
4.7 Exploration performance

4.7.1 Total recordable injury rate

The figures show the TRIR for companies and contractors for exploration related activities, in different regions of the world.

The TRIR for companies operating in Europe has risen by 62% compared with the previous 5-year average. Company TRIR has reduced for exploration activities in all other regions. The reduction is particularly notable in South America with a drop from 3.5 for the 2005-2009 average to 0.4 in 2010.

An increase can be seen in the TRIR for contractors in exploration activities in Asia/Australasia and South America, where the TRIR has increased by 36% and 5% respectively, compared with the regional averages for the previous 5-year period. 2010 contractor rates for Africa, Europe and the FSU have reduced to less than half of the 2005-2009 regional averages.

**Total recordable injury rate – exploration**

*per million hours worked (Data from B-1)*

<table>
<thead>
<tr>
<th>Region</th>
<th>Company 2005-2009 average</th>
<th>Company 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>2.89</td>
<td>0.53</td>
</tr>
<tr>
<td>Middle East</td>
<td>2.89</td>
<td>0.53</td>
</tr>
<tr>
<td>South America</td>
<td>2.89</td>
<td>0.53</td>
</tr>
<tr>
<td>FSU</td>
<td>2.89</td>
<td>0.53</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>2.89</td>
<td>0.53</td>
</tr>
<tr>
<td>Europe</td>
<td>2.89</td>
<td>0.53</td>
</tr>
</tbody>
</table>

**Contractor 2010 average 2.89**

**Contractor 2005-2009 average 2.89**

**Exploration**

Geophysical, seismographic and geological operations, including their administrative and engineering aspects, construction, maintenance, materials supply and transportation of personnel and equipment; excludes drilling.
### 4.7.2 Lost time injury frequency

The figures show the LTIF for companies and contractors for exploration related activities, in different regions of the world. The 2010 result is compared with average LTIF results in the previous 5-year period.

In 2010 the average LTIF values for companies and contractors engaged in exploration activities are 0.28 and 0.47 respectively; the overall average LTIF for exploration activities is 0.42. The company result is up by 17% compared with the 2005-2009 average and the contractor result is down by 52%.

Company LTIF values associated with exploration show an increase in all regions except the FSU and the Middle East compared with the previous 5-year period.

LTIF results associated with exploration activities for contractors have reduced in all regions except Asia/Australasia and North America when compared with the 2005-2009 regional averages.

**NOTE:** In many instances where the LTIF or TRIR is reported as 0.00, the number of work hours reported for the specific function and region are relatively low. A detailed breakdown of the hours by region and function is presented in Appendix B.

---

*Lost time injury frequency – exploration per million hours worked (Data from B-11)*

<table>
<thead>
<tr>
<th>Region</th>
<th>Company 2005-2009 Average</th>
<th>Company 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>Contractor 2005-2009 Average</th>
<th>Contractor 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.7.3 Restricted work day case + lost time injury frequency

The figures show the RWDC+LTI frequency for companies and contractors for exploration related activities, in different regions of the world.

A reduction is seen in the RWDC+LTI frequency for contractors in all regions except Asia/Australasia and South America.
4.8 Drilling performance

4.8.1 Total recordable injury rate

The figures show the TRIR for companies and contractors for drilling related activities in different regions of the world.

Company TRIR shows a reduction in all regions apart from Europe and the FSU compared with the average for the previous 5-year period.

A reduction can be seen in TRIR results for contractors in drilling operations in all regions when compared with the 2005-2009 regional averages.

**Total recordable injury rate – drilling**

*per million hours worked (Data from 8-1)]*

\[
\begin{align*}
\text{Company 2005-2009 average} & \quad \text{Contractor 2005-2009 average} \\
\text{Company 2010} & \quad \text{Contractor 2010}
\end{align*}
\]

- Africa
- Asia/Australasia
- Europe
- FSU
- Middle East
- North America
- South America

**Contractor 2010 average 3.17**

**Company 2010 average 1.56**
4.8.2 Lost time injury frequency

The figures show the LTIF for companies and contractors in drilling related activities in different regions of the world.

In 2010 the average LTIF values for companies and contractors engaged in drilling activities are 0.60 and 0.86 respectively; the overall average LTIF for drilling activities is 0.82. The company result is down by 2% compared with the 2005-2009 average and the contractor result is down by 41%.

A reduction can be seen in LTIF results for contractors in drilling operations in all regions except North America when compared with the 2005-2009 regional averages.
4.8.3 Restricted work day case + lost time injury frequency

The figures show the RWDC+LTI frequency for companies and contractors for drilling related activities, in different regions of the world.

A reduction can be seen for company RWDC+LTI frequency in all regions except Africa and Europe compared with the average for the previous 5-year period. The frequency for Africa has increased by 60% and for Europe it has more than doubled.

A reduction can also be seen in RWDC+LTI frequency for contractors in drilling activities in all regions except Africa, most noticeably in the FSU where the 2010 average is less than a quarter of the average for the previous 5-year period.
4.9 Production performance

4.9.1 Total recordable injury rate

The figures show the TRIR for companies and contractors for production related activities in different regions of the world.

A reduction in TRIR was reported for companies in Africa and the FSU where the 2010 averages have reduced to just 41% and 32% respectively of the regional averages for the previous 5-year period.

When compared with the average for the previous 5-year period, a reduction is shown in all regions except Asia/Australasia for both company and contractor operations.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Company 2010 average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSU</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
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<tr>
<td>Middle East</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td>1.75</td>
<td>2.32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When compared with the average for the previous 5-year period, a reduction is shown in all regions except Asia/Australasia for both company and contractor operations.
4.9.2 Lost time injury frequency

The figures show the LTIF for companies and contractors for production related activities in different regions of the world.

The LTIF for companies working in production activities has reduced in all regions but Asia/Australasia and North America, where it has increased by 42% and 30% respectively compared with the 2005-2009 regional averages. In the FSU the 2010 company average is just 18% of the average for the previous 5-year period.

The 2010 LTIF associated with contractors working in production activities has reduced in all regions apart from Asia/Australasia where the LTIF shows an increase of 17% compared with the 2005-2009 average. In the FSU and South America regions the 2010 contractor LTIF is less than half of the average for the preceding 5-year period.
4.9.3 Restricted work day case + lost time injury frequency

The figures show the RWDC + LTI frequency for companies and contractors for production related activities in different regions of the world.

When compared with the average for the previous 5-year period, a reduction can be seen in all regions, with the exception of Asia/Australasia and South America, for both companies and contractors in production activities.

The 2010 RWDC + LTI frequencies for both companies and contractors in production activities in the FSU are approximately a quarter of the 2005-2009 averages.
4.10 Construction performance

2010 is the fifth year in which the category 'construction' has been in use therefore the previous 4 years’ data (2006-2009) are presented for comparison purposes. The company and contractor results for 2010 construction performance are presented below.

4.10.1 Total recordable injury rate

The TRIR in Europe and North America is higher than the FSU and the Middle East for contractors.

Construction activities are predominately conducted by contractors therefore the work hours reported for contractors are much greater than those reported for company employees. Refer to Appendix B for detailed information.

**Total recordable injury rate – construction**

*per million hours worked (Data from B-13)*

Construction

All major construction, fabrication activities and also disassembly, removal and disposal (decommissioning) at the end of the facility life. Includes construction of process plant, yard construction of structures, offshore installation, hook-up and commissioning and removal of redundant process facilities.
4.10.2 Lost time injury frequency

The LTIF is high for contractors employed in construction activities in Europe and South America compared with other regions.

4.10.3 Restricted work day case + lost time injury frequency

The 2010 RWDC + LTI frequency for companies in construction activities in Europe, North America and South America is higher than in the other regions.
4.11 Unspecified function performance

Appendix F shows the size of the database in thousands of hours worked for each contributing company and whether reported data are broken down by function. Where the data are not broken down by function the reporting company's entire dataset will be included in the unspecified function.

4.11.1 Total recordable injury rate

This is the first year where analysis of the data reported in the ‘unspecified’ function has been included within the report.

In 2010, 29% of the ‘unspecified’ work hours were associated with company activities compared with 71% associated with contractor activities.

In the ‘unspecified’ function for 2010 the only company injury which contributed to the TRIR for South America was 1 restricted work day case. The 15 company fatalities associated with the Pakistan air crash were reported under the ‘unspecified’ function.

In 2007, 393 company medical treatment cases were reported for the FSU region under the ‘unspecified’ function, this resulted in an increase in the 2005-2009 average for this region.

Across all regions between 8 and 390 contractor medical treatment cases were reported per year over the 2005 to 2009 period (average was 110 per region per year) compared with between 1 and 393 company medical treatment cases (average was 33 per region per year) during the same period.
4.11.2 Lost time injury frequency

Reported under the ‘unspecified’ function in 2010 were:
• 15 company and 15 contractor fatalities
• 47 company and 166 contractor lost work day cases

Reported under the ‘unspecified’ function from 2005 to 2009 were:
• 22 company and 100 contractor fatalities
• 534 company and 1,686 contractor lost work day cases

Lost time injury frequency – unspecified
per million hours worked (Data from B-14)

The company work hours represented 29% of the 2010, and 31% of the 2005-2009 work hours reported under the function ‘unspecified’.

Unspecified

Unspecified is used for the entry of data associated with office personnel whose work hours and incident data cannot be reasonably assigned to the administrative support of one of the function groupings of exploration, drilling, production or construction. Corporate overhead support function personnel such as finance or human resources staff may be examples where work hours cannot be specifically assigned to a particular function. All other data that are not separated out by function are reported as ‘unspecified’.
4.11.3 Restricted work day case + lost time injury frequency

The Restricted work day case + lost time injury frequency graphs show a large difference between company and contractor statistics. Contractors in all regions reported between 2 and 257 restricted work day cases in a single year over the 2005 to 2009 period (average was 49 per region per year) compared with between 0 and 19 company restricted work day cases in a single year (average was 5 per region per year) during the same period.

The largest number of restricted work day cases from 2005 to 2009 was reported in the North America region. North America also showed the largest average difference between company and contractor reported restricted work day cases, where the annual average company RWDCs was 19 compared with an average number of contractor RWDCs per year of 168. Company work hours reported for North America represented 36% of the total work hours reported in the 'Unspecified' function.
5 Results by company

This section compares the safety performance of individual companies with each other and with their performance in previous years.

5.1 Overall company results

For reasons of anonymity, each of the 42 companies that has contributed relevant data and is to be included in this analysis has been allocated a unique code letter (A to PP). These codes change every year in line with LTIF performance.

5.1.1 Total recordable injury rate

The TRIR for companies together with their contractors is presented below. Data are only included where MTCs are reported. Data from 41 companies qualified for inclusion. The TRIR for company alone is plotted alongside the TRIR for company and contractors jointly. The incidence of a fatality in either company or contractor operations is also indicated. Details of results are tabulated in Appendix B.

- 23 of the 41 companies presented below suffered one or more fatality.
- In 6 instances, contractors achieved a lower TRIR than the companies they were employed by.

Performance ranking of companies jointly with contractors – total recordable injury rate per million hours worked (Data page B-15)
5.1.2 Lost time injury frequency

The figure shows, in rank order, the LTIF for companies together with their contractors. All 42 companies (A to PP) contributed company and contractor data, although not always for every country in which operations were conducted.

The LTIF for the company alone is plotted alongside the LTIF for company and contractors jointly. The incidence of a fatality in either company or contractor operations is also indicated. Details of results are tabulated in Appendix B.

- 35 companies with their contractors delivered a LTIF of less than 1.
- 16 companies’ LTIF was below than the average (0.42) and 26 companies’ LTIF was above.
- 24 of the 42 companies presented below suffered one or more fatality.
- In 12 instances, contractors achieved a lower LTIF than the companies they were employed by.
In the figure below, the data are reorganised to show companies ranked according to LTIF performance for company personnel alone, omitting contractor input.

- 7 companies – M, P, X, AA, EE, OO and PP – reported no lost time incidents among company employees (LTIF zero). However, most of these companies reported relatively few workhours, hence the results are unlikely to be a reliable indicator of their longer term performance.
- 21 companies reported an LTIF lower than the 2010 company only average (0.41) and 21 companies reported an LTIF higher than the company only average.
In the figure below the LTIF is presented for those companies which, with their contractors, reported more than 50 million hours worked. 19 companies met this criteria in 2010, compared with 21 in 2009. Companies are shown in rank order of the company-with-contractor LTIF.

- 10 of the 19 companies with their contractors performed below the overall average for companies with contractors reporting more than 50 million hours worked (0.38).
- The range in 2010 was between 0.16 and 1.31 lost time injuries per million hours worked.
- 17 of the 19 companies suffered one or more fatalities.
The remaining 23 companies which, with their contractors, reported less than 50 million hours worked are presented below in rank order of the company-with-contractor LTIF.

- 10 of the 23 companies with their contractors performed below than the overall average for companies with contractors (0.61).
- The range in 2010 was between 0.07 and 1.57 lost time injuries per million hours worked.
- 7 of the 23 smaller companies suffered one or more fatalities.
The table below shows the trends in company-with-contractor performance. The 42 companies reporting joint performance are listed together with the LTIF for 2010. For each company where data are available the chart shows whether performance in the reference year had improved or worsened relative to the previous year. Empty cells indicate where the company made no data submission for one or both of the comparison years.

• One company, company II, achieved improvement year by year over the previous 5-year period.
• No company's performance deteriorated year by year over the period 2006-2010.

<table>
<thead>
<tr>
<th>Company code</th>
<th>2010 Company &amp; contractor LTIF</th>
<th>LTIF Performance relative to previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.57</td>
<td>worse</td>
</tr>
<tr>
<td>B</td>
<td>1.42</td>
<td>better</td>
</tr>
<tr>
<td>C</td>
<td>1.35</td>
<td>better</td>
</tr>
<tr>
<td>D</td>
<td>1.31</td>
<td>better</td>
</tr>
<tr>
<td>E</td>
<td>1.29</td>
<td>better</td>
</tr>
<tr>
<td>F</td>
<td>1.19</td>
<td>better</td>
</tr>
<tr>
<td>G</td>
<td>1.14</td>
<td>worse</td>
</tr>
<tr>
<td>H</td>
<td>0.99</td>
<td>better</td>
</tr>
<tr>
<td>I</td>
<td>0.95</td>
<td>better</td>
</tr>
<tr>
<td>J</td>
<td>0.88</td>
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</tr>
<tr>
<td>K</td>
<td>0.85</td>
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</tr>
<tr>
<td>L</td>
<td>0.79</td>
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<tr>
<td>M</td>
<td>0.75</td>
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<tr>
<td>N</td>
<td>0.74</td>
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<tr>
<td>O</td>
<td>0.71</td>
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</tr>
<tr>
<td>P</td>
<td>0.68</td>
<td>worse</td>
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<tr>
<td>Q</td>
<td>0.61</td>
<td>better</td>
</tr>
<tr>
<td>R</td>
<td>0.60</td>
<td>worse</td>
</tr>
<tr>
<td>S</td>
<td>0.59</td>
<td>better</td>
</tr>
<tr>
<td>T</td>
<td>0.59</td>
<td>better</td>
</tr>
<tr>
<td>U</td>
<td>0.55</td>
<td>better</td>
</tr>
<tr>
<td>V</td>
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</tr>
<tr>
<td>W</td>
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<td>better</td>
</tr>
<tr>
<td>X</td>
<td>0.43</td>
<td>better</td>
</tr>
<tr>
<td>Y</td>
<td>0.42</td>
<td>worse</td>
</tr>
<tr>
<td>Z</td>
<td>0.42</td>
<td>better</td>
</tr>
<tr>
<td>AA</td>
<td>0.41</td>
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<td>BB</td>
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<td>DD</td>
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<td>HH</td>
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<tr>
<td>II</td>
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<td>JJ</td>
<td>0.23</td>
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</tr>
<tr>
<td>KK</td>
<td>0.19</td>
<td>worse</td>
</tr>
<tr>
<td>LL</td>
<td>0.16</td>
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</tr>
<tr>
<td>MM</td>
<td>0.16</td>
<td>better</td>
</tr>
<tr>
<td>NN</td>
<td>0.16</td>
<td>better</td>
</tr>
<tr>
<td>OO</td>
<td>0.10</td>
<td>better</td>
</tr>
<tr>
<td>PP</td>
<td>0.07</td>
<td>same</td>
</tr>
</tbody>
</table>

Note: in this table, results are compared with the previous year, thus an empty box will occur when a company has not reported data for the current or previous year.
5.2 Company results by function

Results of companies together with their contractors have been analyzed by function to allow more in-depth benchmarking between companies. The TRIR indicator has been selected, and the ranked results are shown in the following charts. Only companies that provided data by function are included, and then only those companies that reported more than 100,000 hours worked. Results against smaller numbers of hours would not have any statistical significance. The company code letters are the same as used elsewhere in this section. For those companies that submitted data in both 2010 and 2009, an indication of whether the performance in 2010 was better or worse than in 2009 is shown on the graph.
Regions and countries throughout the Safety performance indicators are grouped in the same geographic regions as have been historically used in this report so as to ensure consistency;
The database for the year 2010 covers 3,411,144,000 hours worked in the exploration & production sector of the oil & gas industry. The database is 5% smaller than it was in 2009. The reduction in hours is largely due to the end of construction projects in the Middle East.

- 74% of the hours reported were associated with onshore activities, 26% with offshore activities.
- 102 countries are represented in the database, the same number as in 2009. Countries are listed in Appendix G.
- 42 companies contributed data. All contributed contractor statistics, though not in every case for each country of operation.
- Of the 42 companies, 41 had contributed data in 2009. Since these 41 accounted for 99% of the database in 2010, comparison of the year 2010 results with those of 2009 is legitimate and statistically meaningful. 39 of the companies submitting 2010 data had also provided data in 2008.
- 20 of the companies contributed 90% of the hours. 7 companies between them covered 52% of the hours, and the largest contributor accounted for 11%.
A summary of the key elements of the database is shown in the table at the end of this section.

‘Unspecified’ is used for the entry of data associated with office personnel whose work hours and incident data cannot be reasonably assigned to the administrative support of one of the function groupings of exploration, drilling, production or construction. Corporate overhead support function personnel such as finance or human resources staff may be examples where work hours cannot be specifically assigned to a particular function. All other data that are not separated out by function are reported as ‘unspecified’.
Proportion of database used in analysis

For calculations of FAR, FIR and LTIF:
• All hours in the database were used.

For calculations of TRIR:
• Submissions without information on medical treatment cases were filtered out, leaving a database of 3,398 million hours, almost 100% of the database.
• In 2009, the TRIR database was 3,756 million hours, also nearly 100% of the total database.
• The regions where the smallest proportion of the database could be used were Asia/Australasia and Europe (both 99%). In all other regions, 100% of the database was used.

For calculations of lost work day severity:
• Submissions without information on days off work were filtered out, leaving a database of 2,754 million hours, 81% of the total database.
• In 2009, this database was 2,858 million hours, 80% of the total database.
• North America and Europe have only 37% and 54% severity information respectively, whereas more than 95% of the South American databases was useable.

For calculations of RWDC + LTI frequency:
• Submissions without information on restricted work days were filtered out, leaving a database of 3,278 million hours, 96% of the total database.
• In 2009, this database was 3,333 million hours, 93% of the total database.
• 87% of the Asia/Australasia database could be used for calculations of RWDC+LTI Frequency. For all other regions, more than 95% of the database was included in these analyses.

For calculations of restricted work day severity:
• Submissions without information on days assigned to restricted activities were filtered out, leaving a database of 1,916 million hours, 56% of the total database.
• In 2009 this database was 1,735 million hours, 52% of the total database.

More detailed information is shown in the tables below.

<table>
<thead>
<tr>
<th>Percent. of useable data – regions</th>
<th>TRIR analyses</th>
<th>Lost work day severity analyses</th>
<th>RWDC+LTI frequency analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>100%</td>
<td>85%</td>
<td>100%</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>99%</td>
<td>82%</td>
<td>87%</td>
</tr>
<tr>
<td>Europe</td>
<td>99%</td>
<td>54%</td>
<td>99%</td>
</tr>
<tr>
<td>FSU</td>
<td>100%</td>
<td>91%</td>
<td>100%</td>
</tr>
<tr>
<td>Middle East</td>
<td>100%</td>
<td>91%</td>
<td>95%</td>
</tr>
<tr>
<td>North America</td>
<td>100%</td>
<td>37%</td>
<td>100%</td>
</tr>
<tr>
<td>South America</td>
<td>100%</td>
<td>95%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent. of useable data – functions</th>
<th>TRIR analyses</th>
<th>Lost work day severity analyses</th>
<th>RWDC+LTI frequency analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>99%</td>
<td>87%</td>
<td>96%</td>
</tr>
<tr>
<td>Drilling</td>
<td>99%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>Production</td>
<td>99%</td>
<td>76%</td>
<td>97%</td>
</tr>
<tr>
<td>Construction</td>
<td>100%</td>
<td>87%</td>
<td>96%</td>
</tr>
</tbody>
</table>

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## Appendix B

### Data tables

### Summary of data

<table>
<thead>
<tr>
<th>Region</th>
<th>Type</th>
<th>Hours worked ('000s)</th>
<th>No. fatalities</th>
<th>No. LWD C's</th>
<th>No. RWDC's</th>
<th>No. MTC's</th>
<th>FAR</th>
<th>LTIF</th>
<th>TRIR</th>
<th>RWDC+LTI frequency</th>
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</thead>
<tbody>
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<td>7</td>
<td>32</td>
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<td>26,210</td>
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<td>6</td>
<td>9</td>
<td>15</td>
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<td>0.27</td>
<td>1.18</td>
<td>0.61</td>
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<td></td>
<td>Contractor Onshore</td>
<td>306,565</td>
<td>9</td>
<td>117</td>
<td>94</td>
<td>174</td>
<td>2.94</td>
<td>0.41</td>
<td>1.29</td>
<td>0.72</td>
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<td>Contractor Offshore</td>
<td>158,558</td>
<td>8</td>
<td>46</td>
<td>94</td>
<td>156</td>
<td>5.05</td>
<td>0.34</td>
<td>1.92</td>
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<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td>562,121</td>
<td>19</td>
<td>185</td>
<td>204</td>
<td>377</td>
<td>3.38</td>
<td>0.36</td>
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<td><strong>Asia/Australasia</strong></td>
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<td>Company Offshore</td>
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<td>0.00</td>
<td>0.48</td>
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<tr>
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<td>Contractor Onshore</td>
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<td>Contractor Offshore</td>
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<td><strong>Sub Total</strong></td>
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Section 1 Summary

Data relating to graphs in the summary can be found in the detail sections below.

Section 2 Overall results

Total recordable injury rate

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<th>Overall</th>
<th>Company</th>
<th>Contractor</th>
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Hours 2010 ('000s) | 2,510,287 | 887,342 | 3,397,629 | 720,541 | 2,677,088

Fatal accident rate

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<th>Contractor</th>
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Hours 2010 ('000s) | 2,523,802 | 887,342 | 3,411,144 | 725,673 | 2,685,471

Fatal incident rate

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<th>Contractor</th>
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<td>4.92</td>
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<td>3.51</td>
<td>1.91</td>
<td>4.04</td>
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<td>1.69</td>
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<td>1.35</td>
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Hours 2010 ('000s) | 2,523,802 | 887,342 | 3,411,144 | 725,673 | 2,685,471
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<tr>
<td>Exposure noise, chemical, biological, vibration</td>
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### Lost Work Day Cases by category, 2010

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<td>Cut, puncture, scrape</td>
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### Lost time injury frequency

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<td>0.90</td>
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<td>2003</td>
<td>1.13</td>
<td>1.27</td>
<td>1.16</td>
<td>0.79</td>
<td>1.32</td>
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<td>2004</td>
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<td>1.09</td>
<td>0.87</td>
<td>1.17</td>
</tr>
<tr>
<td>2005</td>
<td>0.92</td>
<td>1.12</td>
<td>0.97</td>
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<td>1.13</td>
<td>0.99</td>
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<td>0.42</td>
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Hours 2010 ('000s) 2,523,802 887,342 3,411,144 725,673 2,685,471

### Fatalities by activity, 2010

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</tr>
<tr>
<td>Diving, subsea, ROV</td>
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<td>1.1</td>
</tr>
<tr>
<td>Drilling, workover, well services</td>
<td>21</td>
<td>22.3</td>
</tr>
<tr>
<td>Lifting, crane, rigging, deck operations</td>
<td>6</td>
<td>6.4</td>
</tr>
<tr>
<td>Maintenance, inspection, testing</td>
<td>5</td>
<td>5.3</td>
</tr>
<tr>
<td>Office, warehouse, accommodation, catering</td>
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<td>1.1</td>
</tr>
<tr>
<td>Production operations</td>
<td>6</td>
<td>6.4</td>
</tr>
<tr>
<td>Seismic/survey operations</td>
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<td>4.3</td>
</tr>
<tr>
<td>Transport – air</td>
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</tr>
<tr>
<td>Transport – land</td>
<td>8</td>
<td>8.5</td>
</tr>
<tr>
<td>Transport – water, including marine activity</td>
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### Lost Work Day Cases by activity, 2010

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<td>Drilling, workover, well services</td>
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<td>Maintenance, inspection, testing</td>
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</tr>
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<td>Office, warehouse, accommodation, catering</td>
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<td>Production operations</td>
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<tr>
<td>Seismic/survey operations</td>
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<td>1.9</td>
</tr>
<tr>
<td>Transport – air</td>
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<td>1.0</td>
</tr>
<tr>
<td>Transport – land</td>
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</tr>
<tr>
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### Lost Work Day Cases by category, 2010

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<th>Contractor</th>
<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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<td>Assault or violent act</td>
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<td>12</td>
<td>14</td>
<td>10</td>
<td>4</td>
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<td>205</td>
<td>228</td>
<td>117</td>
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<td>Confined space</td>
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<td>1</td>
<td>1</td>
<td>0</td>
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<tr>
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<td>51</td>
<td>55</td>
<td>37</td>
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<td>Explosions or burns</td>
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<td>38</td>
<td>66</td>
<td>47</td>
<td>19</td>
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<td>Exposure electrical</td>
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<td>10</td>
<td>6</td>
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<td>Exposure noise, pressure, chemical, biological, vibration</td>
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<td>17</td>
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<td>20</td>
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<tr>
<td>Falls from height</td>
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<td>109</td>
<td>137</td>
<td>92</td>
<td>45</td>
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<td>141</td>
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<td>207</td>
<td>140</td>
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<tr>
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<td>3</td>
<td>0</td>
<td>3</td>
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<tr>
<td>Other</td>
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<td>130</td>
<td>92</td>
<td>38</td>
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<tr>
<td></td>
<td>271</td>
<td>1,065</td>
<td>1,336</td>
<td>813</td>
<td>523</td>
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### Lost Work Day Cases by activity, 2010

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<th>Contractor</th>
<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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</thead>
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<tr>
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<td>158</td>
<td>100</td>
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</tr>
<tr>
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<td>7</td>
<td>1</td>
<td>6</td>
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<td>290</td>
<td>315</td>
<td>194</td>
<td>121</td>
</tr>
<tr>
<td>Lifting, crane, rigging, deck operations</td>
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<td>80</td>
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<td>33</td>
<td>55</td>
</tr>
<tr>
<td>Maintenance, inspection, testing</td>
<td>55</td>
<td>163</td>
<td>218</td>
<td>104</td>
<td>114</td>
</tr>
<tr>
<td>Office, warehouse, accommodation, catering</td>
<td>35</td>
<td>60</td>
<td>95</td>
<td>73</td>
<td>22</td>
</tr>
<tr>
<td>Production operations</td>
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<td>65</td>
<td>146</td>
<td>93</td>
<td>53</td>
</tr>
<tr>
<td>Seismic/survey operations</td>
<td>2</td>
<td>24</td>
<td>26</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>Transport – air</td>
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<td>10</td>
<td>13</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Transport – land</td>
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<tr>
<td>Transport – water, including marine activity</td>
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<td>49</td>
<td>12</td>
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<tr>
<td>Unspecified – other</td>
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<td>120</td>
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<td></td>
<td>271</td>
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<td>813</td>
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### Lost work day case severity

<table>
<thead>
<tr>
<th>Year</th>
<th>Company</th>
<th>Contractor</th>
<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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</thead>
<tbody>
<tr>
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<td>24.7</td>
<td>23.9</td>
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<td>21.3</td>
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<td>23.8</td>
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<tr>
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<td>23.7</td>
<td>24.2</td>
<td>24.5</td>
<td>23.1</td>
</tr>
<tr>
<td>2006</td>
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<td>24.9</td>
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<tr>
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| Hours 2010 ('000s) | 547,177 | 2,207,003 | 2,754,180 | 2,112,172 | 642,008 |
### Restricted work day case + lost time injury frequency

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<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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<td>2.00</td>
<td>2.01</td>
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<td>1.90</td>
<td>1.68</td>
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<td>2.57</td>
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<tr>
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<td>0.73</td>
<td>1.64</td>
<td>1.39</td>
<td>1.23</td>
<td>1.92</td>
</tr>
<tr>
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<td>1.37</td>
<td>1.23</td>
<td>1.85</td>
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<td>1.37</td>
<td>1.31</td>
<td>1.61</td>
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<td>2006</td>
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<td>1.59</td>
<td>1.41</td>
<td>1.26</td>
<td>1.91</td>
</tr>
<tr>
<td>2007</td>
<td>0.80</td>
<td>1.33</td>
<td>1.21</td>
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<td>1.60</td>
</tr>
<tr>
<td>2008</td>
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<td>1.10</td>
<td>1.03</td>
<td>0.85</td>
<td>1.59</td>
</tr>
<tr>
<td>2009</td>
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<td>0.88</td>
<td>0.83</td>
<td>0.66</td>
<td>1.43</td>
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**Hours 2010 ('000s)**

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<th>Contractor</th>
<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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</thead>
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### Restricted work day case severity

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<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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<td>21.9</td>
<td>21.3</td>
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**Hours 2010 ('000s)**

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<th>Company</th>
<th>Contractor</th>
<th>Overall</th>
<th>Onshore</th>
<th>Offshore</th>
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### Section 3  Results by region

#### Total recordable injury rate

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<th>Asia/Australasia</th>
<th>Europe</th>
<th>FSU</th>
<th>Middle East</th>
<th>North America</th>
<th>South America</th>
<th>All regions</th>
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</thead>
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<td>0.98</td>
<td>2.89</td>
<td>2.76</td>
<td>1.68</td>
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**Hours 2010 ('000s)**

<table>
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<th>Asia/Australasia</th>
<th>Europe</th>
<th>FSU</th>
<th>Middle East</th>
<th>North America</th>
<th>South America</th>
<th>All regions</th>
</tr>
</thead>
<tbody>
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<td>304,470</td>
<td>461,034</td>
<td>675,691</td>
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<td>381,479</td>
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### Lost time injury frequency

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<th>2009</th>
<th>Hours 2010 ('000s)</th>
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<td>0.42</td>
<td>562,121</td>
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<tr>
<td>Asia/Australasia</td>
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<td>0.29</td>
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### Total recordable injury rate – 5-year rolling average

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### Lost time injury frequency – 5-year rolling average

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Note: the method of calculating rolling averages changed with the publication of 2010 data. Historic figures presented above have been recalculated accordingly.
### Severity of lost work day cases

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### Restricted work day case + lost time injury frequency by region

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<td>3.52</td>
<td>2.20</td>
<td>no</td>
<td></td>
<td>Trinidad &amp; Tobago</td>
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</tr>
<tr>
<td></td>
<td>Norway</td>
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<td>1.23</td>
<td>1.79</td>
<td>no</td>
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<tr>
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<td>1.08</td>
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<td></td>
<td>Ecuador</td>
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<tr>
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<td></td>
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<td></td>
<td>Bolivia</td>
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</table>
### Section 4 Results by function

#### Exposure hours by function ('000s)

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<th>2009</th>
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<tr>
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<td>348,515</td>
</tr>
<tr>
<td>Production</td>
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</tr>
<tr>
<td>Construction</td>
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<tr>
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#### Fatal accident rate – 3-year rolling average

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<th>Production</th>
<th>Construction</th>
<th>Other</th>
<th>Unspecified</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4.24</td>
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<td>3.92</td>
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<td>8.01</td>
<td>4.17</td>
<td>3.20</td>
<td>3.19</td>
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<td></td>
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<tr>
<td>2008</td>
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<td>4.49</td>
<td>3.60</td>
<td>2.41</td>
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Note: the method of calculating rolling averages changed with the publication of 2010 data. Historic figures presented above have been recalculated accordingly.

#### Fatal accident rate

<table>
<thead>
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<th>Production</th>
<th>Construction</th>
<th>Other</th>
<th>Unspecified</th>
</tr>
</thead>
<tbody>
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<tr>
<td>2006</td>
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<td>6.91</td>
<td>3.42</td>
<td>2.68</td>
<td>3.40</td>
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<tr>
<td>2007</td>
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<td>2.43</td>
<td>3.14</td>
<td>3.00</td>
<td>3.03</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>2.94</td>
<td>4.02</td>
<td>4.19</td>
<td>1.88</td>
<td>2.91</td>
<td></td>
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<tr>
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<td>4.59</td>
<td>4.85</td>
<td>1.49</td>
<td>1.65</td>
<td></td>
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<td>6.36</td>
<td>2.07</td>
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Note: the method of calculating FAR on a functional basis has changed with the publication of 2010 data to use the incident function instead of the function of the victim. Historic figures presented above have been recalculated accordingly.

#### Total recordable injury rate

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<th>Production</th>
<th>Construction</th>
<th>Other</th>
<th>All functions</th>
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<td>5.80</td>
<td>3.64</td>
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<td>3.05</td>
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<td>2006</td>
<td>2.66</td>
<td>5.17</td>
<td>3.27</td>
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<tr>
<td>2007</td>
<td>2.66</td>
<td>5.34</td>
<td>3.03</td>
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<td>2.68</td>
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<tr>
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<td>4.63</td>
<td>2.64</td>
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<td>2.09</td>
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<tr>
<td>2009</td>
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<td>1.27</td>
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<tr>
<td>2010</td>
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<td>2.94</td>
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<td>0.99</td>
<td>1.68</td>
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<td>869,540</td>
<td>3,397,629</td>
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</table>

† 2006-2009 average for ‘construction’
### Lost time injury frequency – 3-year rolling average

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<th>Exploration</th>
<th>Drilling</th>
<th>Production</th>
<th>Construction</th>
<th>Other</th>
<th>Unspecified</th>
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<tr>
<td>2005</td>
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<td>1.18</td>
<td>0.73</td>
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<tr>
<td>2006</td>
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<td>1.66</td>
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<tr>
<td>2007</td>
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<td>1.53</td>
<td>1.05</td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>0.83</td>
<td>1.46</td>
<td>0.89</td>
<td>0.35</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>2009</td>
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<td>0.72</td>
<td>0.27</td>
<td>0.42</td>
<td></td>
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<tr>
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<td>0.63</td>
<td>0.23</td>
<td>0.34</td>
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</table>

Note: the method of calculating rolling averages changed with the publication of 2010 data. Historic figures presented above have been recalculated accordingly.

### Lost time injury frequency

<table>
<thead>
<tr>
<th>Year</th>
<th>Exploration</th>
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<th>Production</th>
<th>Construction</th>
<th>Other</th>
<th>Overall</th>
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<tbody>
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<td>1.57</td>
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<tr>
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<td>1.69</td>
<td>1.22</td>
<td>0.75</td>
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<td>1.09</td>
</tr>
<tr>
<td>2003</td>
<td>1.19</td>
<td>1.73</td>
<td>1.11</td>
<td>0.64</td>
<td></td>
<td>1.16</td>
</tr>
<tr>
<td>2004</td>
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<td>1.71</td>
<td>1.23</td>
<td>0.77</td>
<td></td>
<td>1.09</td>
</tr>
<tr>
<td>2005</td>
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<td>1.53</td>
<td>1.22</td>
<td>0.76</td>
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<td>0.97</td>
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<td>1.73</td>
<td>1.16</td>
<td>0.50</td>
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<td>0.99</td>
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<tr>
<td>2007</td>
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<td>0.82</td>
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<td>0.66</td>
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<tr>
<td>2008</td>
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<td>0.70</td>
<td>0.27</td>
<td></td>
<td>0.55</td>
</tr>
<tr>
<td>2009</td>
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<td>0.21</td>
<td></td>
<td>0.45</td>
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<td>0.82</td>
<td>0.54</td>
<td>0.24</td>
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<td>0.42</td>
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</table>

Hours 2010 (‘000s) | 83,397 | 518,505 | 965,145 | 869,540 | 3,411,144 |

### Severity of lost work day cases

<table>
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<th>Year</th>
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<th>Construction</th>
<th>Other</th>
<th>Unspecified</th>
<th>All functions</th>
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<tbody>
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<td>2005</td>
<td>8.4</td>
<td>26.5</td>
<td>26.7</td>
<td>21.8</td>
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<td>24.2</td>
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<td>23.7</td>
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<td>22.7</td>
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<td></td>
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<td>24.9</td>
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<tr>
<td>2007</td>
<td>25.6</td>
<td>40.6</td>
<td>37.9</td>
<td>24.2</td>
<td></td>
<td>30.7</td>
<td>35.1</td>
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<tr>
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<td>37.6</td>
<td>42.2</td>
<td>30.2</td>
<td>26.9</td>
<td></td>
<td>37.6</td>
<td>34.7</td>
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<td>2009</td>
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<td>44.3</td>
<td>38.4</td>
<td>34.7</td>
<td></td>
<td>29.9</td>
<td>37.5</td>
</tr>
<tr>
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<td>25.4</td>
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<td>29.9</td>
<td>28.0*</td>
<td></td>
<td>28.2</td>
<td>29.9</td>
</tr>
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<td>28.7</td>
<td>55.8</td>
<td>49.8</td>
<td>27.3</td>
<td></td>
<td>22.6</td>
<td>43.9</td>
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</tbody>
</table>

Hours 2010 (‘000s) | 72,872 | 449,378 | 740,851 | 759,030 | 732,049 | 2,754,180 |

†: 2006-2009 average for ‘construction’

### RWDC + LTI frequency by function

<table>
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<th>Exploration</th>
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<th>Production</th>
<th>Construction</th>
<th>Other</th>
<th>Unspecified</th>
<th>All functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1.66</td>
<td>2.68</td>
<td>1.55</td>
<td>0.93</td>
<td></td>
<td>1.26</td>
<td>1.37</td>
</tr>
<tr>
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<td>2.88</td>
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<td>0.84</td>
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<td>1.41</td>
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<tr>
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<td>2.75</td>
<td>1.35</td>
<td>0.74</td>
<td></td>
<td>0.92</td>
<td>1.21</td>
</tr>
<tr>
<td>2008</td>
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<td>2.52</td>
<td>1.28</td>
<td>0.45</td>
<td></td>
<td>0.85</td>
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<tr>
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<td></td>
<td>0.60</td>
<td>0.83</td>
</tr>
<tr>
<td>Ave ‘05-09</td>
<td>1.47</td>
<td>2.55</td>
<td>1.37</td>
<td>0.54*</td>
<td></td>
<td>0.91</td>
<td>1.14</td>
</tr>
<tr>
<td>2010</td>
<td>1.18</td>
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<td>1.01</td>
<td>0.47</td>
<td></td>
<td>0.63</td>
<td>0.86</td>
</tr>
</tbody>
</table>

Hours 2010 (‘000s) | 80,192 | 501,907 | 941,580 | 841,642 | 912,960 | 3,278,281 |

†: 2006-2009 average for ‘construction’
### Exploration – TRIR for company & contractor by region

<table>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>1.92</td>
<td>1.56</td>
<td>1.46</td>
<td>3.06</td>
<td>2,084</td>
<td>21,301</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>0.19</td>
<td>0.37</td>
<td>2.75</td>
<td>2.02</td>
<td>5,282</td>
<td>14,188</td>
</tr>
<tr>
<td>Europe</td>
<td>0.60</td>
<td>0.37</td>
<td>1.09</td>
<td>3.68</td>
<td>3,345</td>
<td>2,747</td>
</tr>
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<td>FSU</td>
<td>0.00</td>
<td>0.89</td>
<td>0.00</td>
<td>3.55</td>
<td>287</td>
<td>745</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.00</td>
<td>0.93</td>
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<td>2.45</td>
<td>3,192</td>
<td>6,774</td>
</tr>
<tr>
<td>North America</td>
<td>0.70</td>
<td>1.36</td>
<td>3.23</td>
<td>5.31</td>
<td>4,279</td>
<td>2,165</td>
</tr>
<tr>
<td>South America</td>
<td>0.44</td>
<td>3.51</td>
<td>6.19</td>
<td>5.89</td>
<td>2,296</td>
<td>14,386</td>
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<td>2.89</td>
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</tr>
</tbody>
</table>

### Exploration – LTIF for company & contractor by region

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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Africa</td>
<td>0.48</td>
<td>0.42</td>
<td>0.33</td>
<td>1.06</td>
<td>2,084</td>
<td>21,301</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>0.19</td>
<td>0.12</td>
<td>0.56</td>
<td>0.49</td>
<td>5,282</td>
<td>14,188</td>
</tr>
<tr>
<td>Europe</td>
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<td>0.15</td>
<td>0.36</td>
<td>1.73</td>
<td>3,671</td>
<td>2,747</td>
</tr>
<tr>
<td>FSU</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.07</td>
<td>287</td>
<td>745</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.00</td>
<td>0.46</td>
<td>0.30</td>
<td>0.61</td>
<td>3,192</td>
<td>6,774</td>
</tr>
<tr>
<td>North America</td>
<td>0.23</td>
<td>0.12</td>
<td>0.46</td>
<td>0.23</td>
<td>4,279</td>
<td>2,165</td>
</tr>
<tr>
<td>South America</td>
<td>0.44</td>
<td>0.28</td>
<td>0.70</td>
<td>1.47</td>
<td>2,296</td>
<td>14,386</td>
</tr>
<tr>
<td>All regions</td>
<td>0.28</td>
<td>0.24</td>
<td>0.47</td>
<td>0.98</td>
<td>21,091</td>
<td>62,306</td>
</tr>
</tbody>
</table>

### Exploration – RWDC+LTI frequency for company & contractor by region

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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Africa</td>
<td>0.96</td>
<td>0.44</td>
<td>0.56</td>
<td>1.59</td>
<td>2,084</td>
<td>21,301</td>
</tr>
<tr>
<td>Asia/Australasia</td>
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<td>0.09</td>
<td>1.28</td>
<td>0.90</td>
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<td>14,020</td>
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<td>0.00</td>
<td>3.00</td>
<td>287</td>
<td>745</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.00</td>
<td>0.46</td>
<td>0.74</td>
<td>1.47</td>
<td>2,421</td>
<td>6,774</td>
</tr>
<tr>
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### Drilling – TRIR for company & contractor by region

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### Drilling – RWDC+LTI frequency for company & contractor by region

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### Production – LTIF for company & contractor by region

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### Production – RWDC+LTI frequency for company & contractor by region

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### Construction – TRIR for company & contractor by region

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### Construction – LTIF for company & contractor by region

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### Section 5  Results by company

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© OGP
## Total recordable injury rate by function

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**Overall**: 0.99

**Overalls**: 0.78, 0.60, 0.53, 0.45, 0.43, 0.39, 0.38, 0.33, 0.32, 0.17, 0.00, 0.00

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## Appendix A  Database dimensions

### Total exposure hours

<table>
<thead>
<tr>
<th>Year</th>
<th>Overall</th>
<th>Company</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>656</td>
<td>410</td>
<td>245</td>
</tr>
<tr>
<td>1986</td>
<td>544</td>
<td>306</td>
<td>238</td>
</tr>
<tr>
<td>1987</td>
<td>602</td>
<td>356</td>
<td>247</td>
</tr>
<tr>
<td>1988</td>
<td>616</td>
<td>364</td>
<td>253</td>
</tr>
<tr>
<td>1989</td>
<td>656</td>
<td>331</td>
<td>325</td>
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<tr>
<td>1990</td>
<td>721</td>
<td>332</td>
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<td>1998</td>
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<td>2000</td>
<td>1,634</td>
<td>572</td>
<td>1,062</td>
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<tr>
<td>2001</td>
<td>1,977</td>
<td>633</td>
<td>1,344</td>
</tr>
<tr>
<td>2002</td>
<td>2,121</td>
<td>636</td>
<td>1,484</td>
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<tr>
<td>2003</td>
<td>2,247</td>
<td>664</td>
<td>1,583</td>
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<tr>
<td>2004</td>
<td>2,290</td>
<td>639</td>
<td>1,652     <img src="image" alt="" /></td>
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<td>2005</td>
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<td>2008</td>
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<td>712</td>
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<tr>
<td>2009</td>
<td>3,586</td>
<td>822</td>
<td>2,764</td>
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<tr>
<td>2010</td>
<td>3,411</td>
<td>726</td>
<td>2,685</td>
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</table>

### Exposure hours by region ('000s)

<table>
<thead>
<tr>
<th>Region</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>562,121</td>
<td>542,110</td>
</tr>
<tr>
<td>Asia/Australasia</td>
<td>725,171</td>
<td>697,524</td>
</tr>
<tr>
<td>Europe</td>
<td>308,870</td>
<td>319,178</td>
</tr>
<tr>
<td>FSU</td>
<td>461,827</td>
<td>350,792</td>
</tr>
<tr>
<td>Middle East</td>
<td>676,337</td>
<td>1,018,682</td>
</tr>
<tr>
<td>North America</td>
<td>295,339</td>
<td>320,541</td>
</tr>
<tr>
<td>South America</td>
<td>381,479</td>
<td>337,015</td>
</tr>
<tr>
<td>All regions</td>
<td>3,411,144</td>
<td>3,585,842</td>
</tr>
</tbody>
</table>

### Exposure hours by function ('000s)

<table>
<thead>
<tr>
<th>Function</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>83,397</td>
<td>61,435</td>
</tr>
<tr>
<td>Drilling</td>
<td>518,505</td>
<td>348,515</td>
</tr>
<tr>
<td>Production</td>
<td>965,145</td>
<td>948,771</td>
</tr>
<tr>
<td>Construction</td>
<td>869,540</td>
<td>1,076,322</td>
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<tr>
<td>Unspecified</td>
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<td>1,150,799</td>
</tr>
<tr>
<td>All functions</td>
<td>3,411,144</td>
<td>3,585,842</td>
</tr>
</tbody>
</table>
# Appendix C
## Fatal incident reports by region

### Africa

#### Onshore

**Algeria, Construction, Aug 13 2010**

<table>
<thead>
<tr>
<th>Number of deaths: 1</th>
<th>Incident Category: Caught In, Under or Between</th>
<th>Activity: Construction, Commissioning, Decommissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 34</td>
<td>Employer: Contractor</td>
<td>Occupation: Transportation Operator</td>
</tr>
</tbody>
</table>

**Narrative:**

During excavation activities, the truck driver was parking his truck in the position advised by the excavator operator. When the truck driver wanted to go forward he turned on the key but the engine did not start, so he got out of the cabin to check the engine starter, placing himself with his chest between the wheel and the arc of the truck, and tried to create a short on the positive and negative terminals of the starter with an iron wire. The starter turned on the engine and the truck moved because the first gear was selected and pushed him to the ground: the edge of the wheel ran over the right side of the victim’s body.

**What went wrong:**

- Inadequate safety and technical training – maintenance procedure not followed.

**Corrective actions and recommendations:**

- Perform an exhaustive census of sensitive facilities and equipment used on the project and list the vehicle safety systems
- Prepare and distribute a technical equipment user manual (trucks, cranes, excavators, bulldozers, generators)
- Check that all drivers and operators of machinery and equipment have received this technical manual
- Review the entire system of facilities management and project equipment in order to:
  - Ensure the existence and monitoring of a logbook for each equipment/installation project
  - Ensure the existence and monitoring of a maintenance plan and monitoring for each equipment installation project
  - Ensure effective communication system to ensure support operations curative maintenance optimally
- Undertake a training/awareness for all staff, from management to workers, to ensure better collection and management of risks including the suspension of activities/dangerous situations.

**Causal factors:**

- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication

**Congo – Democratic Republic of the Congo (formerly Zaire), Construction, Jun 4 2010**

<table>
<thead>
<tr>
<th>Number of deaths: 1</th>
<th>Incident Category: Falls from Height</th>
<th>Activity: Construction, Commissioning, Decommissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 36</td>
<td>Employer: Contractor</td>
<td>Occupation: Maintenance, Craftsman</td>
</tr>
</tbody>
</table>

**Narrative:**

During the activity of reinforcement of existing electric pylon on the line between Loudima and Mindouli, the winch operator starts to pull conductor with insulators chain. When insulators chain was close to final destination, the waist of pylon starts to bend and pylon collapse, leading in its fall the 8 workers attached on the pylon.

**What went wrong:**

- Procedure not followed; improper work execution; not in compliance with the operating procedure; insufficient prevention/protection measure; lack of communication; lack of training and competence; lack of supervision

**Corrective actions and recommendations:**

- Identification and removal from the Project of contractor’s personnel both in HQ and on site in charge for work management and execution.

**Causal factors:**

- People (acts): Following Procedures: Violation unintentional (by individual or group)
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
Fatality Incident Reports by Region

Egypt, Drilling, Dec 19 2010
Number of deaths: 1  Incident Category: Struck by  Activity: Lifting, Crane, Rigging, Deck operations
Age: 42  Employer: Contractor  Occupation: Manual Labourer

Narrative:
The fatality occurred during the attempt to off-load some bundles of pipes from a truck. The scope of operation was to off-load a total of five bundles (containing a total number of 82 tubulars, 5.5") from a truck. Sequence of events:

- The truck arrived at the site, the unloading team noticed that the truck was loaded in such a way as not to allow a straightforward placement of slings for lifting by the crane.
- Three pipe bundles on the truck were unevenly laid, and improperly secured without all the necessary pipe belts; additionally two pipe bundles were added on top, with no safety belts to secure them. Two persons including the Victim had to climb onto the truck and stood over the load to place the slings underneath the bundles assisted by a forklift intervention.
- When the forklift made the initial attempt to lift the bundles, some of the pipes of the higher bundle started to fall, rolling towards the Victim.
- The Victim attempted to jump-off the truck, but apparently tripped on some pipes, lost balance, and fell on one pipe which had already reached the ground, violently hitting his face against it. Immediately after that, further pipes rolled off the truck, crushing the victim’s legs, upper back and head.

Corrective actions and recommendations:
- Cover all loading and unloading operations with checklists based on risk assessment
- Deliver an induction for supervisors
- Urgent road map in order to have an HSE MS in place
- Apply HSE disciplinary policy to all contractors
- Prepare an induction and seminars to all workers operating under Contractor to disseminate the need to avoid shortcuts
- Bridge the Medical Requirements for subcontractors and get fitness to work certificates for all workers
- Issue minimum safety requirements for acceptance of load to be handled
- Continue Supervisors Train the Trainer and Leadership sessions
- Appoint Supervisors for unloading operations at yard
- Specialized 3rd party inspection to inspect all contractor lifting gear and equipment
- Specialized 3rd party training on lifting gear/equipment to certify and train contractor workers
- Refresher lifting awareness sessions to be delivered to all riggers and workers who are dealing with the loading/offloading operations
- Enforce lessons learned dissemination and follow up
- Issue the PTW and develop a specific risk assessment and JSA
- Close supervision by HSE to all contractor work
- Review the implementation of HSEQ requirements attached to the contract
- Perform an urgent audit on the implementation of HSE Requirement by all the contractors
- Urgently fill the position of Contract Administrator. The position has been in the organization for one year (October 2009).

Causal factors:
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Overexertion or improper position/posture for task
- People (acts): Following Procedures: Improper lifting or loading
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
IP was fatally injured while he was carrying out painting work of pipes. A pipe was being lifted by a forklift, the pipe rolled off the fork and hit the IP trapping him between two pipes. The pipes weighed approx 10 tonnes each.

What went wrong:
- Ineffective supervision
- Clear roles & responsibilities were not in place
- Appropriate consideration not given to short notice task changes
- PTW process not followed (forklift ops not included in risk assessment)
- Intervention culture not effective on site
- Forklift used to lift pipe considered inappropriate
- Productivity prioritised by key site supervision
- Possible delays to departure of ambulance

Corrective actions and recommendations:
- Effective hazard awareness training
- Task risk assessment process
- Permit To Work policy
- Toolbox talks/STARRT card processes
- Improve Planning process
- Deploy lifting procedures
- Emergency Response arrangements
- Share Learnings

Causal factors:
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Following Procedures: Improper lifting or loading
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Use of Protective Methods: Failure to warn of hazard
- People (acts): Use of Protective Methods: Equipment or materials not secured
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
- Process (conditions): Organisational: Failure to report/learn from events
**Fatal Incident Reports by Region**

### Ethiopia, Exploration, Apr 5 2010

<table>
<thead>
<tr>
<th>Number of deaths: 1</th>
<th>Incident Category: Assault or Violent act</th>
<th>Activity: Seismic/Survey Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 40</td>
<td>Employer: Contractor</td>
<td>Occupation: Process/Equipment Operator</td>
</tr>
</tbody>
</table>

**Narrative:**

Incident occurred at 1445hrs 5th April 2010 during the seismic line crews checking/troubleshooting of line cable. The deceased was the back crew (last crew in line) where he was repairing the seismic cable (outside vehicle) with a driver inside the pick up truck and a military personnel guarding him (outside vehicle). Suddenly, two (2) unknown attackers appeared from the left side and fired shots at the deceased in the neck and he died instantly. The driver and military personnel were injured.

**What went wrong:**
- Ineffective military tactics applied to protect the personnel working on lines (no clearing patrols conducted prior insertion of crew to the lines)
- Inadequate number of armed escort assigned to the personnel working.

**Corrective actions and recommendations:**
- The military needs to review the tactical formation and strategy to ensure that crew are protected without leaving gaps for breaches and infiltration on the flanks
- All work units must have a minimum number of escorts
- To pull out from the seismic operations if the security exposure and other hazards and risk could not be reduced to as low as reasonably practicable.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Protective Systems: Inadequate security provisions or systems
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

### Gabon, Drilling, Sep 23 2010

<table>
<thead>
<tr>
<th>Number of deaths: 1</th>
<th>Incident Category: Caught In, Under or Between</th>
<th>Activity: Drilling, Workover, Well Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 57</td>
<td>Employer: Company</td>
<td>Occupation: Foreman, Supervisor</td>
</tr>
</tbody>
</table>

**Narrative:**

While walking next to a truck, drilling Supervisor was hurt and crushed by a 5.5” tube. When the truck was passing over, the tube was flung forward by the back wheels of the trailer. The truck did not immediately stop and continued pushing it over legs and back of the victim. The tube was temporary positioned on the ground to prepare further underground installation.

**What went wrong:**
- HSE Management System in place and responsibilities were not properly defined and implemented
- Non respect of Work Permit procedures
- Failure of planning and coordination of the ongoing activities; No daily meeting (several unexpected activities at the same time)
- Lack of control, support, resources from the Management
- Insufficient delegation of task
- Failure to identify and evaluate risk

**Corrective actions and recommendations:**
- Permit to work system should be implemented and reinforced in case of simultaneous activities. This allows risk to be identified, evaluated and known by anyone involved before starting any activity.
- Activities should be planned and coordinated. The planning should be communicated during daily meeting.
- Activities should be continually supervised. Supervisor should not get involved in practical tasks so that he can preserve “overview” of the activities ongoing within perimeter of his responsibilities. He should focus on supervising task in order to ensure permanent control of risk.

**Causal factors:**
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Use of Protective Methods: Failure to warn of hazard
- People (acts): Use of Protective Methods: Equipment or materials not secured
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
### Fatal Incident Reports by Region

#### Nigeria, Production, Sep 1 2010

**Number of deaths:** 1  
**Incident Category:** Struck by  
**Activity:** Transport – Land  
**Employer:** Contractor  
**Occupation:** Other  
**Age:** unknown  
**Narrative:**  
Vehicle accident in which a security guard was struck by a bus. The vehicle driver claimed brake failure as the cause. The security guard incurred fatal injuries and died a day later.  
**What went wrong:**  
Unknown  
**Causal factors:**  
- People (acts): Following Procedures: Violation unintentional (by individual or group)  

#### Nigeria, Production, Dec 31 2010

**Number of deaths:** 1  
**Incident Category:** Assault or Violent act  
**Activity:** Transport – Land  
**Employer:** Contractor  
**Occupation:** Engineer, Scientist, Technician  
**Age:** 53  
**Narrative:**  
A minibus transporting seven personnel was ambushed and attacked whilst returning from a worksite. This resulted in fatal injury of one person and the abduction of another person. The remaining personnel were safe with no major injuries. The minibus was being escorted by security forces at the time of the ambush.  
**What went wrong:**  
- Gaps in project responsibility for all journey management  
- Minibus driver lacked effective training skills when in an ambush  
**Corrective actions and recommendations:**  
- Integrate logistics procedure with the Security Dept/’s Procedure  
- Central overview of all journeys in high risk area  
- All drivers to be part of a security led convoy to undergo convoy and evasive driving techniques. Include convoy attack drills in Emergency Response plans.  
**Causal factors:**  
- People (acts): Inattention/Lack of Awareness: Acts of violence

#### Nigeria, Unspecified, Oct 31 2010

**Number of deaths:** 2  
**Incident Category:** Struck by  
**Activity:** Transport – Land  
**Employer:** Contractor  
**Occupation:** Unknown  
**Age:** unknown  
**Age:** unknown  
**Narrative:**  
Two contractors were fatally injured when a contractor bus ran into a group of workers standing in the road. With visibility restricted due to fog, a contractor bus conveying workers to project, ran into a group of workers who had disembarked from other buses which had stopped about 1500 metres from a road block to avoid protestors at the road block.  
**What went wrong:**  
- Project Journey Management Plan not fully effective  
- Pre-trip briefing for this trip appear to be incomplete  
- Pre-trip inspections not consistently performed  
- Neither Journey Manager nor bus driver was aware of requirements for passengers in the event of an accident or breakdown  
- Bus driver was potentially driving inappropriately for the conditions  
**Corrective actions and recommendations:**  
- Review and Communicate Bus driver & passenger guidance for transport of workers to the worksite  
**Causal factors:**  
- No Causal Factors Allocated
**Fat al Incident Reports by Region**

**Offshore**

**Cameroun, Production, Aug 31 2010**

**Number of deaths:** 2  
**Incident Category:** Water related, Drowning  
**Activity:** Transport - Water, incl. Marine activity  
**Employer:** Contractor  
**Occupation:** Maintenance, Craftsman

**Narrative:**
Two contractors fell overboard from a Platform Supply Vessel when unmooring from a field mooring buoy just outside the 500m zone of the platform. One body was recovered from the sea. The second person is still missing.

**What went wrong:**
- Gaps in contractor HSE management and supervision
- Gaps in competence assurance of HSE critical staff
- Gaps in emergency response drills

**Corrective actions and recommendations:**
- Ensure inclusion of remote facilities/sites in management visits to provide contract assurance and promote intervention culture
- Review mobilisation period at beginning of new offshore operations contract to ensure scope and requirements are fully imbedded, also after first mobilisation assessment.

**Causal factors:**
- No causal factors allocated

**Cameroun, Production, Nov 16 2010**

**Number of deaths:** 2  
**Incident Category:** Assault or Violent act  
**Activity:** Production Operations  
**Employer:** Contractor  
**Occupation:** Transportation Operator

**Narrative:**
Major Security/Piracy issue, 5 shot dead: Three soldiers (third parties), 2 contractors (pilot and mechanic).

**What went wrong:**
- Ambush of surveillance boat devoted to securing of Cameroonian waters with E&P activities.

**Corrective actions and recommendations:**
- Improve Security preparedness of Tanker terminal.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Acts of violence

**Congo – Democratic Republic of the Congo (formerly Zaire), Production, Apr 1 2010**

**Number of deaths:** 1  
**Incident Category:** Pressure Release  
**Activity:** Production Operations  
**Employer:** Company  
**Occupation:** Process/Equipment Operator

**Narrative:**
A senior Operator who had just started his morning shift went to check the pig receiver station for the presence of a pig launched into the 13” gas pipeline (13 km, 1050 psi). The pig transit time being highly variable (from few hours to days), it was local practice to repeatedly open the pig trap, the pig signaller being considered unreliable. The fatal incident occurred some 20 minutes later when the pig trap closure shot forward. The ensuing blast resulted in the victim and a VSD skid (3300lbs) being propelled overboard.

**What went wrong:**
- Catastrophic failure of pig trap station.

**Corrective actions and recommendations:**
- Working on pressurised equipment can be considered as routine (no PTW) and may happen to be dangerous
- Deficient equipment integrity
- Poor layout area
- Improper position.

**Causal factors:**
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
### Equatorial Guinea, Production, Jun 28 2010

**Number of deaths:** 1  
**Incident Category:** Other  
**Activity:** Unspecified – other  
**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Unknown  
**Narrative:** Incident subject to pending litigation.  
**Causal factors:** No causal factors allocated

### Nigeria, Drilling, Jul 31 2010

**Number of deaths:** 1  
**Incident Category:** Falls from Height  
**Activity:** Lifting, Crane, Rigging, Deck operations  
**Age:** 28  
**Employer:** Contractor  
**Occupation:** Other  
**Narrative:** During an overload test of a crane on a drilling floating rig the lower part of the overhead structure supporting the boom failed, the crane detached and fell into the sea dislodging the cabin crane. 3 persons who were participating in the test and standing at the cabin fell overboard. 2 were recovered and 1 was declared missing after 3 days of search.  
**Support of the boom broke under excessive lateral forces. Causes are not easily identifiable. Rupture might have been caused by lack of control of load balance or sudden breakage during rotation movement during unsuitable test conditions.**  
**What went wrong:**  
- Lack of management control and supervision.  
- Poor coordination between involved parties.  
- Poor risk assessment.  
- Lack of work preparedness.  
**Corrective actions and recommendations:**  
- Crane overload test should be considered as critical task, risk assessed in consequence and communication ensured to all concerned parties including site HSE Manager.  
- Crane overload test in open sea should not be considered.  
- Technicians calibrating the system and the crane operators should be trained to ensure correct understanding of the safe load indicator and crane monitoring system.  
- Level of supervision should be enough for the risk level and continually maintained during operation (e.g. test Supervisor should not act as crane operator).  
**Causal factors:**  
- People (acts): Following Procedures: Violation intentional (by individual or group)  
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment  
- Process (conditions): Organisational: Inadequate communication  
- Process (conditions): Organisational: Inadequate supervision

### Nigeria, Unspecified, Jan 4 2010

**Number of deaths:** 2  
**Incident Category:** Assault or Violent act  
**Activity:** Construction, Commissioning, Decommissioning  
**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Manual Labourer  
**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Manual Labourer  
**Narrative:** Two contract workers sustained fatal injuries and two others were wounded, from gunshots inflicted by army forces. The deceased were involved in a confrontation with soldiers at an access gate at the end of their shift. The soldiers had responded to a perceived threat to personnel from agitated contract workers departing from the worksite at the end of the day.  
**What went wrong:**  
- Contract workers were agitated due to transit delays, gate security checks, work standby throughout the day, and imminent demobilizations.  
- The arrival of an army vehicle coming in the opposite direction incited some in the crowd who attacked the vehicle.  
**Corrective actions and recommendations:**  
- Communicate and emphasize policy requirements regarding workplace violence and expected conduct of the workforce.  
- Expand Pre-Job Planning risk assessments to consider risks associated with workforce disruptions that could lead to unrest.  
- Assure that government security forces receive appropriate orientation.  
**Causal factors:**  
- People (acts): Following Procedures: Violation intentional (by individual or group)  
- People (acts): Inattention/Lack of Awareness: Acts of violence  
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
# Fatal Incident Reports by Region

## Asia/Australasia

### Onshore

**China, Production, Oct 1 2010**

- **Number of deaths:** 1  
- **Incident Category:** Pressure Release  
- **Activity:** Maintenance, Inspection, Testing  
  - **Employer:** Contractor  
  - **Occupation:** Unknown  
  - **Age:** unknown

**Narrative:**

In a land terminal, a contractor was replacing the rusted screws of a ball valve. When he was replacing the last screws, the pole of the ball valve was ejected out due to internal high pressure. The contractor’s head was struck heavily by the pole. The contractor was killed by the blow. The terminal shut down production for one day before replacing the rusted screws. During the shut down process, employees closed the ball valves. The cool light hydrocarbon with some pressure was stored inside the ball valves. With the temperature of the hydrocarbon rising, the pressure inside the ball valves rose so that when the screws were replaced, the accident happened.

**What went wrong:**
- The staff were not aware of the high pressure inside the ball valves.
- The ball valves have no high pressure relief equipment.

**Corrective actions and recommendations:**
- Before replacing the screws, the ball valves should be in the open position.
- Operation training on all kinds of valves.

**Causal factors:**
- People (acts): Following Procedures: Overexertion or improper position/posture for task
- People (acts): Use of Protective Methods: Equipment or materials not secured
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

**India, Production, Nov 27 2010**

- **Number of deaths:** 1  
- **Incident Category:** Caught In, Under or Between  
  - **Activity:** Unspecified - other  
  - **Employer:** Contractor  
  - **Occupation:** Other  
  - **Age:** 34

**Narrative:**

Security Guard on duty found trapped beneath one side of the swing gate as the gate fell on him. He fell unconscious and was later declared dead at hospital. No external bodily injury observed.

**What went wrong:**
- Incident is being investigated.

**Corrective actions and recommendations:**
- Incident is being investigated.

**Causal factors:**
- No causal factors allocated

**India, Construction, Feb 13 2010**

- **Number of deaths:** 1  
- **Incident Category:** Caught In, Under or Between  
  - **Activity:** Construction, Commissioning, Decommissioning  
  - **Employer:** Contractor  
  - **Occupation:** Manual Labourer  
  - **Age:** 39

**Narrative:**

Contractor workers were engaged in manual unloading of marble slabs and stacking in a near vertical position against a scaffolding frame. A pile of slabs became unbalanced and fell trapping two men beneath. One of them died from internal injuries a few hours later.

**What went wrong:**
- Inadequate HSE supervision by the contractor.
- Lack of job safety analysis and risk identification.

**Corrective actions and recommendations:**
- Site staff to put in practice the contractor HSE Management System.
- Establish Contractor HSE Management audit system.
- Train staff in manual handling and safe practices for storing material.

**Causal factors:**
- People (acts): Following Procedures: Improper lifting or loading
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision
Pakistan, Exploration, Feb 18 2010
Number of deaths: 1
Incident Category: Assault or Violent act
Activity: Seismic/Survey Operations
Age: 34
Employer: Contractor
Occupation: Other

Narrative:
A recording team consisting of 20 technical persons moved to area Gurzandi where they had also been earlier. The Police had been informed earlier who had detailed 10 police men and 15 local security guards. According to reports at 12.30 the survey recording group came under fire initially from nearby mountains. The guards took positions with crew getting into cover. The fire came again and the Police and security guards responded with return fire that continued for over two hours. During the operation bullets fired from the top of a mountain hit a security guard killing him.

What went wrong:
• Conflict with local landlord caused a fire-fight.

Corrective actions and recommendations:
• Better communication with local “lords”.

Causal factors:
• People (acts): Inattention/Lack of Awareness: Acts of violence

Pakistan, Unspecified, Nov 5 2010
Number of deaths: 21
Incident Category: Other
Activity: Transport - Air
Age: 38
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 33
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 35
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 38
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 44
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 32
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 35
Employer: Company
Occupation: Other
Age: 39
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 40
Employer: Company
Occupation: Other
Age: 34
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 34
Employer: Company
Occupation: Engineer, Scientist, Technician
Age: 31
Employer: Company
Occupation: Other
Age: 30
Employer: Company
Occupation: Other
Age: 43
Employer: Contractor
Occupation: Admin, Management, Support Staff
Age: 54
Employer: Contractor
Occupation: Admin, Management, Support Staff
Age: 53
Employer: Contractor
Occupation: Other
Age: 53
Employer: Contractor
Occupation: Other
Age: 42
Employer: Contractor
Occupation: Engineer, Scientist, Technician
Age: 42
Employer: Contractor
Occupation: Other
Age: 49
Employer: Company
Occupation: Other
Age: 39
Employer: Company
Occupation: Other

Narrative:
On November 05, 2010, at around 07:25 hours, a chartered Aircraft crashed immediately after taking off from Karachi’s Jinnah International Airport. The flight was on routine schedule destined for the gas field carrying 15 Company and 6 Contractor Employees. None of the passengers and crew members survived.

Causal factors:
• No causal factors allocated
Fatal incident reports by region

Asia/Australasia

Offshore

Indonesia, Drilling, Mar 3 2010

Number of deaths: 1  
Incident Category: Struck by  
Activity: Lifting, Crane, Rigging, Deck operations

Age: unknown  
Employer: Contractor  
Occupation: Manual Labourer

Narrative:
Injured party (IP) was struck by a non-magnetic drill collar after it was lifted out of a basket. The lifting boom was not properly positioned over the load. The collar swung and struck the IP in the abdomen.

What went wrong:
A non-magnetic drill collar was to be removed from its transport basket and laid out on the adjacent open bay. As the lift progressed out of the basket, one of the roustabouts involved in the lifting operation realized that the boom needed to be repositioned over the load and called for a stop. At this stage the collar was clear of the basket and swung towards the injured party (IP) who was clear of it as it passed by. The collar struck a beam and on its return swing the collar impacted the IP in the lower abdomen area.

Corrective actions and recommendations:
The facts of the incident are as follows: The IP was struck by a drill collar. Prior to the drill collar striking the IP, a boom required repositioning which allowed the drill collar to swing clear of the basket. Personnel should be aware of body position and place themselves in the safest possible position. Consider developing a predetermined escape route during planned lifts.

Causal factors:
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Following Procedures: Improper lifting or loading

Malaysia, Drilling, Sep 4 2010

Number of deaths: 1  
Incident Category: Struck by  
Activity: Transport - Water, incl. Marine activity

Age: 30  
Employer: Contractor  
Occupation: Manual Labourer

Narrative:
The incident occurred during the installation of the remaining 1 km of a new 24” diameter x 52 km long pipeline from a Drilling Platform to another platform using an 8 points anchored Pipe/Derrick Lay Barge DLB 264 in 70 meters of water depth, offshore. On 4th Sept 2010 at 0200 hrs, the Deceased, onboard an Anchor Handling Tugboat (AHT), was in the process of unhooking the slackening Work Wire hook from the anchor buoy(S3) lifting sling to hook to the buoy Pennant Wire Pickup Line/Float Rope. Work Wire suddenly re-tensioned due to the sudden movement of the buoy causing the Work Wire hook & shackle assembly to directly hit the Deceased on the right arm and right forehead.

What went wrong:
- The job was carried out during heavy rain with southerly wind at 25 – 30 knots (i.e. > 18 – 22 knots) and AHT was pitching in 5 – 8 ft wave.
- Using Float Rope instead of Buoy Sling wire to pull buoy on deck and later removal of sling to transfer to float rope to pull anchor up.
- JHA does not cover recovery of buoy by sling wire
- There was no deck supervisor to supervise the operation on deck.

Corrective actions and recommendations:
- Strengthen implementation of Stop Work Policy during bad weather
- To include usage of tugger wire and recovery of buoy in abnormal situation in the Anchor Handling Procedure.
- Enhance the integrity of hazards and controls identification for each step involved in the job.
- Enhance supervision at worksite especially for critical activities.

Causal factors:
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Use of Protective Methods: Equipment or materials not secured
- Process [conditions]: Protective Systems: Inadequate/defective guards or protective barriers
- Process [conditions]: Work Place Hazards: Storms or acts of nature
- Process [conditions]: Organisational: Inadequate training/competence
- Process [conditions]: Organisational: Inadequate hazard identification or risk assessment
- Process [conditions]: Organisational: Inadequate supervision
**Fatal Incident Reports by Region**

**Thailand, Drilling, Oct 11 2010**

**Number of deaths:** 1  
**Incident Category:** Struck by  
**Activity:** Drilling, Workover, Well Services

**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Drilling/Well Servicing Operator

**Narrative:**
An assistant driller suffered fatal injuries when he was struck by a falling cement head and bonnet.

**What went wrong:**
- Supervisor instructions not followed.
- Work (cement bonnet lock down bolts were retracted) was performed before the JSA review completed.
- Cementing head and bonnet not secured to prevent it from falling.
- Written step by step instructions were not in place.
- Trapped pressure was not considered and not released.
- Working in the congested area. Limited access and egress.

**Corrective actions and recommendations:**
- The working procedures and instructions must be strictly followed.
- Clear communication, supervision and control shall be conducted with all parties involved.
- If there is any operational change, procedure and Job safety analysis must be reviewed.
- Cementing equipment must be secured at all times to prevent it from falling.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation
- People (acts): Use of Protective Methods: Equipment or materials not secured
- People (acts): Inattention/Lack of Awareness: Lack of attention/distraction by other concerns/stress
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Work Place Hazards: Congestion, clutter or restricted motion
- Process (conditions): Organisational: Inadequate communication

**Vietnam, Drilling, Nov 2 2010**

**Number of deaths:** 1  
**Incident Category:** Caught In, Under or Between  
**Activity:** Transport - Water, incl. Marine activity

**Age:** 37  
**Employer:** Contractor  
**Occupation:** Manual Labourer

**Narrative:**
While waiting for lift No.7 from a Rig, a team of 3 deck crews (the Deceased and 2 Able Bodied) took refuge in the vicinity of an empty Mixing Tank and Filter Pod Skid on the starboard stern of a supply vessel. A sudden swell of about 4-6 meters hit the vessel stern, causing the empty Mixing Tank (estimated weight 5 MT) to skid towards the Filter Pod; and knocked the deceased who was standing in front of the Mixing Tank, resulting in fatal injury.

**What went wrong:**
- Failure to follow work procedures, including requirement on securing of cargo during heavy weather.
- Unsafe position; deceased was standing in between 2 unsecured cargoes.
- Work is done in bad weather; wind speed 26 - 33 knots southerly wind, 3 to 4 meter swell.

**Corrective actions and recommendations:**
- Strengthen compliance to procedure including more practical procedures to secure loads on the deck which will not creating gaps between cargoes.
- Improve safety/hazards awareness among personnel by ensuring the communication of hazards is done in toolbox meeting prior job execution.
- To set the criteria and implement Stop Work Policy during bad weather.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Work Place Hazards: Storms or acts of nature
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate communication
Vietnam, Drilling, Nov 3 2010

<table>
<thead>
<tr>
<th>Number of deaths:</th>
<th>Number of deaths: 1</th>
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<tbody>
<tr>
<td>Incident Category: Struck by</td>
<td>Incident Category: Struck by</td>
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<tr>
<td>Activity: Lifting, Crane, Rigging, Deck operations</td>
<td>Activity: Lifting, Crane, Rigging, Deck operations</td>
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<td>Age:</td>
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<tr>
<td>Employer:</td>
<td>Employer: Contractor</td>
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<tr>
<td>Occupation:</td>
<td>Occupation: Drilling/Well Servicing Operator</td>
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**Narrative:**
A Service Company Supervisor was fatally injured when a lifting operation on an offshore drilling rig lost control. Originally intended to be present as an observer, the Injured Person (IP) entered the hazard zone when a roustabout handling a tag line queried the rigging arrangement with him. During this brief distraction, the roustabout released tension on the tag line and one leg of the sling caught on an overhead obstruction (a stairwell platform). When the sling became free the load swung towards the IP and his head was caught between the load and a container.

**What went wrong:**
- **Human Factors:**
  - The roustabout did not address the lift supervisor first and the lift was not stopped properly.
  - The IP entered the hazard zone without permission from the lift supervisor.
- **Inadequate planning and organisation of the work:**
  - An adequate and effective Job Safety Analysis (JSA) either written or verbal, was not conducted beforehand; the risks, precautions, lift plan, rigging arrangements, roles and responsibilities and communication were not discussed, consequently.
  - The rigging arrangements weren’t discussed leading to confusion over how the load was rigged and the roustabout’s distraction from the job.
  - There was a lack of awareness of the dangers of the lifting environment.
  - People did not know the arrangements to stop the job. The IP got drawn into the lift, although his role was to observe from a safe place.
- **Failure to follow known procedures:**
  - There was casual compliance with the rig’s processes for the control of work, which if followed more robustly, would have led to greater planning and control over the operation.

**Causal factors:**
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Following Procedures: Improper lifting or loading
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
Europe

Onshore

Romania, Production, Mar 25 2010

Number of deaths: 2
Age: 41
Age: 49
Incident Category: Explosions or Burns
Employer: Company
Employer: Company

Activity: Maintenance, Inspection, Testing
Occupation: Maintenance, Craftsman
Occupation: Maintenance, Craftsman

Narrative:
Maintenance crew from E&P Services, was involved in repairing the oil pipeline (5.5 inch) from Park to Tank Farm. Because of a local explosion followed by fire, two employees (mechanic and welder) got burnt and died on the spot, being in the position hole (1.6 m deep). Another injured person from this incident was the Chief Deputy of EP Sector who was burnt on the face and hands, trying to help his two colleagues. The fire was extinguished by the Military Fire Brigade.

What went wrong:
- Immediate Cause Root: Servicing Equipment in Operation - Error Enforcing Conditions:
  - Over-energetic attention was being paid to the work in hand.
  - Decision to work in unacceptable environment taken for financial/production reasons supervisor tried to do job quickly to get back on line
- Root/Underlying Cause HSE Management System
  - Decision to work in unacceptable environment taken for financial/production reasons
  - Management Commitment: To challenge or stop any activity that conflicts with the HSEQ policies.
- Comments: no one had highlighted the sub standard asset integrity or repair practices in operation

Corrective actions and recommendations:
- The non-recognition and lack of risk control measures
- Failure to follow procedures
- Unused opportunities to intervene
- asking risks, deliberately or unconsciously
- Recommendations: Emphasis should be put on quality of the safety observations/findings, the willingness to intervene and visible participation in operations of the management.

Causal factors:
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Following Procedures: Improper position in the line of fire
- People (acts): Following Procedures: Overexertion or improper position/posture for task
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Use of Protective Methods: Failure to warn of hazard
- People (acts): Use of Protective Methods: Inadequate use of safety systems
- People (acts): Use of Protective Methods: Disabled or removed guards, warning systems or safety devices
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
- Process (conditions): Organisational: Failure to report/learn from events
A maintenance crew from E&P Services composed of 2 mechanics and a welder, with support from a crane operator from Logistic Department, had been replacing a water meter at the Water Station. After they finished the operation, around 14:00 hours, the crane driver prepared to return to Headquarters, to be followed later by the maintenance crew with support from another transportation vehicle. The maintenance crew members asked the crane driver to take them with him. He accepted and took them; the mechanics travelling in the truck cabin and the welder travelling in the crane cabin. During the trip the welder fell from the crane cabin and hit his head on the ground. As a result of the impact the welder passed away.

What went wrong:
- PTW was not registered, signed or correct in any way:
  - Approver could not be found so did not sign
  - Affected Area responsible signed permit,
  - JSA was not checked and was inadequate for job.
  - Performer (crew) did not sign permit. (no-one designated in charge)
  - PTW training did not go down to crew level in this field cluster
- There is little communication about Safety in the base.
- MTN Crew Communication with crews by Section chiefs once they leave base is minimal and LOG drivers without company phone for communication.
- LEA were supposed to be phased out in 2009 but were not as locations were reportedly waiting for more pick ups.

Corrective actions and recommendations:

Lessons learned:
- Non compliance with transportation standard led to fatal incident.
- Managers not actively following up on PTW or JSA increases risk
- Managers not leading actively safety in the operations
- Managers not considering effect of newcomers to teams
- Communications with crews not organized effectively
- Employees not accepting responsibility and accountability for safety.

Recommendations:
- Designate one person in charge of 6 crews and establish communications and control throughout the day (journey mgmt)
- Designate one person responsible in each crew
- Establish program of Safety communications
- Full MS audit
- Disciplinary action for:
  - breaking Standard (employees)
  - failing to implement Standard (Management)
- Immediate retirement of LEA - remove seats as a minimum

Causal factors:
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Following Procedures: Improper position [in the line of fire]
- People (acts): Use of Protective Methods: Failure to warn of hazard
- People (acts): Use of Protective Methods: Inadequate use of safety systems
- People (acts): Use of Protective Methods: Disabled or removed guards, warning systems or safety devices
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process [conditions]: Protective Systems: Inadequate/defective guards or protective barriers
- Process [conditions]: Protective Systems: Inadequate security provisions or systems
- Process [conditions]: Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
- Process [conditions]: Organisational: Inadequate hazard identification or risk assessment
- Process [conditions]: Organisational: Inadequate communication
- Process [conditions]: Organisational: Inadequate supervision
- Process [conditions]: Organisational: Poor leadership/organisational culture
Fatal incident reports by region

FSU

Onshore
Kazakhstan, Construction, Jul 11 2010
Number of deaths: 1
Incident Category: Falls from Height
Activity: Construction, Commissioning, Decommissioning
Age: 51
Employer: Contractor
Occupation: Manual Labourer
Narrative:
A contractor employee, while carrying out roof sheeting activities, fell from a height of 8m onto the internal concrete base of a pump shelter.

What went wrong:
• Permit to Work - Non compliance with deviation procedure.
• Local practices adopted without consultation of technical owner
• Risk Assessment - Unclear work methodology.
• Competency/Personnel – Improper Motivation deemed to be based on organisational optimisation.

Corrective actions and recommendations:
• Review procedure of risk assessment and amend to include prescribed auditing process and quality.
• Existing training on hazards to be reviewed and improved where necessary based on lessons learnt and aligned with Permit to Work, Risk Assessment and Rules.
• The resulting amendments to the procedure of Risk Assessment need to be transferred to the subsidiary training program, which in turn should be forwarded to all Contractors for onward training to their Supervisory personnel.
• Instructions should be issued to all Contractors related to ensuring that Supervisory personnel involved in the development of Risk Assessments can demonstrate a competent understanding of the process. This should be by at least confirming attendance at a specific training session delivered by Contractor personnel.

Causal factors:
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate supervision

Russia, Production, Jan 3 2010
Number of deaths: 1
Incident Category: Struck by
Activity: Production Operations
Age: unknown
Employer: Company
Occupation: Maintenance, Craftsman
Narrative:
An Operator who was removing snow from railways, was fatally injured by the rail tank car of a moving train; the train was withdrawn from the fuel oil loading rack.

What went wrong:
• A shunting master noticed the mechanic, who was on the railway track, too late.
• While cleaning the railway crossing of snow with compressed air the mechanic was on the railway track with his back against moving rail tank cars. There was a lot of noise, which was caused by the compressed air, so the mechanic was not able to hear either dispatcher’s announcement of the train moving, or the noise of the train itself.

Corrective actions and recommendations:
• Implement works related to maintenance of the railway tracks with a team of not less than 2 persons; one of them must act as an observer.
• All operations on rail tracks must be performed in high visibility vests.
• Review the where and how of the incident with the employees of the shops responsible for rail track maintenance; conduct stand down safety meetings.

Causal factors:
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
• Process (conditions): Organisational: Inadequate supervision
### Fatal Incident Reports by Region

#### Russia, Drilling, Jan 29 2010
- **Number of deaths**: 1
- **Incident Category**: Water related, Drowning
- **Activity**: Drilling, Workover, Well Services
- **Age**: 22
- **Employer**: Contractor
- **Occupation**: Drilling/Well Servicing Operator

**Narrative:**
At 00:15 a.m. on January 29th, 2010 at a well field a contractor, born in 1978, an assistant driller, was found dead. At 11:45 p.m. on January 28th, 2010 being on hitch, the injured party came out from the trailer. As he did not return as expected, the crew co-workers began to look for him. His body was found in the wash vessel (Volume=30 cubic meters) which was filled with oil products.

**What went wrong:**
- Fluid level control and sampling through a hatch not fitted with a safety guard rail.
- Rules not complied with that led to the incident.

**Corrective actions and recommendations:**
- Communicate information about incident circumstances and causes and lessons learned to all employees and provide unscheduled briefings.
- Check tanks for the presence and good operating condition of safety guard rails and check protective gratings on floor hatches and openings.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- Process (conditions): Organisational: Poor leadership/organisational culture

#### Russia, Drilling, Feb 21 2010
- **Number of deaths**: 1
- **Incident Category**: Pressure Release
- **Activity**: Drilling, Workover, Well Services
- **Age**: unknown
- **Employer**: Company
- **Occupation**: Drilling/Well Servicing Operator

**Narrative:**
Operations were conducted on the field to remove a temporary line assembled with the use of a pliable rubber reinforced hose equipped with a swagelok at the end. At some point residual pressure tore away the pliable hose and the swagelok from the well casing valve and hit the 4-th grade operator of oil and gas production on the occipital part of his head causing his death.

**What went wrong:**
- Assembling and operation of temporary wellhead piping layout not envisaged by the field facilities setup plan.
- Disassembling a temporary line with residual pressure in it.

**Corrective actions and recommendations:**
- Communicate the accident conditions and causes and lessons learned to all employees and ensure conducting extraordinary safety briefings.
- Do not allow hazardous works without work permits and risk assessment.
- Inspect the equipment used for assembling temporary lines to detect hazardous sections and take actions to replace them.
- Prohibit operation of temporary lines not envisaged by the design and not agreed in the established order.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Poor leadership/organisational culture
Fatal incident reports by region

Russia, Drilling, Sep 17 2010
Number of deaths: 1  
Incident Category: Struck by  
Activity: Seismic/Survey Operations
Age: 37  
Employer: Contractor  
Occupation: Other

Narrative:
At 10:20 am during tree felling performed by the tree-felling crew, a tree-feller assistant suffered a head injury by a falling dead tree. Since being injured the employee was unconscious. The crew members took action to provide him first aid. The paramedic from the party base arrived and conducted revival actions. At 11:50 the paramedic pronounced the man dead. An Incident Investigation Team is established, the investigation is in progress.

What went wrong:
• Falling of a dead tree (a birch) from the forest to the area under clearing, after a fir-tree was cut, in the direction of the forest.

Corrective actions and recommendations:
• Suspend all activities connected with tree-felling during preparation of profiles of less than 3.5 m width for seismic survey works.
• Conduct extra safety indoctrination to all employees of the seismic parties working in the Company facilities.
• Conduct extra safety knowledge assessment for geodetic survey teams employees in terms of tree-cutting work performance.
• Develop a detailed risk assessment for topographic-geodetic survey work performance and coordinate it with TS HSE Department.
• Suspend work performance for 1 hour in the contracting organizations providing services on seismic survey and advise all the employees of the incident investigation report.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
• Process (conditions): Organisational: Poor leadership/organisational culture

Russia, Drilling, Oct 21 2010
Number of deaths: 1  
Incident Category: Exposure Electrical  
Activity: Drilling, Workover, Well Services
Age: 22  
Employer: Contractor  
Occupation: Process/Equipment Operator

Narrative:
At the wellpad of an oil and gas production field, an operator of a subcontracting organisation was drilling out anchors using an auger truck. After drilling out three anchors, the operator drove beyond the wellpad limits in order to drill out the fourth anchor, backing the truck towards the anchor with a raised boom. At 2:10 p.m. while driving to the anchor, the boom of the auger truck came into contact with the phase of 6kV power line. When trying to get out of the auger truck cab, the operator was fatally injured by the electric current.

What went wrong:
• A mobile drilling truck (an auger truck) AZA-3 was moving under VL 6kV with the boom up.
• Ground disturbance was performed in the protected zone of Power Lines without permits signed by the Operator.

Corrective actions and recommendations:
• All types of activities in the protected zone of the power lines shall be performed after the Operator issues a permit.
• A Customer shall control and monitor the ground disturbance activities in the protected zone of power lines.
• The extensions of the masts in mobile drilling units mounted on the trucks shall be equipped with the alarm devices to prevent the contacts with power lines.

Causal factors:
• People (acts): Following Procedures: Violation intentional (by individual or group)
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
**Russia, Drilling, Nov 1 2010**

**Number of deaths:** 1  
**Incident Category:** Caught In, Under or Between  
**Activity:** Unspecified - other  

**Age:** 52  
**Employer:** Contractor  
**Occupation:** Maintenance, Craftsman  

**Narrative:**
A contractor crew consisting of a crane driver and two mechanics prepared to dismount the gear from the SRP surface equipment on the well pad. Six bolts were removed from the gear (brakes were actuated). At 3.30pm the load of the SRP moved downwards causing the gear reverse towards the post and crushed a mechanic who was standing between the gear and post of the SRP. The mechanic suffered fatal injuries. The commission is in place. Investigation is ongoing.

**What went wrong:**
- No fixation of equipment resulting in outbalance of crank gears’ weight and spontaneous moving of a link “crank gear -reducing gearbox”.
- Position of the injured on unfixed equipment motion path.

**Corrective actions and recommendations:**
- Convey the circumstances and causes of the incident to personnel of the Company and Contractor. Conduct stand down safety meetings and an unscheduled safety briefing.
- Make sure that program of work (including detailed plan of work execution, roping schemes, equipment positions, etc.) while repairing pump jacks is developed by specialised organization.
- Determine officials that are guilty of committed violations that resulted in the incident. Hold them administratively liable.

**Causal factors:**
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation
- Process [conditions]: Organisational: Inadequate hazard identification or risk assessment

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**Russia, Drilling, Dec 13 2010**

**Number of deaths:** 1  
**Incident Category:** Struck by  
**Activity:** Drilling, Workover, Well Services  

**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Drilling/Well Servicing Operator  

**Narrative:**
An assistant driller died in hospital of injuries sustained in an incident that occurred during a workover at a well. While casing was being RIH (run in hole), thawing of an ice plug occurred followed by its expulsion from HWDP (heavy weight drill pipe). The ice plug hit the assistant driller on the head.

**Diagnosis:** Heavy TBI. Severe brain contusion. Contusion focus in the right frontal lobe with an intracerebral hematoma. Comminuted fracture of right orbit w/ eyeball damage. Provisional death: cardiopulmonary decompenation.

**What went wrong:**
- Breach of tripping technology.
- Lack of proper control over the weight and volume of liquid displaced.

**Corrective actions and recommendations:**
- Suspend work at all structural units and communicate this info to all employees and drilling contractor companies.
- Check on the effectiveness of heating of pipe sets at setbacks.

**Causal factors:**
- People (acts): Following Procedures: Improper lifting or loading
- Process [conditions]: Organisational: Inadequate supervision

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**Russia, Drilling, Dec 15 2010**

**Number of deaths:** 1  
**Incident Category:** Confined Space  
**Activity:** Construction, Commissioning, Decommissioning  

**Age:** 48  
**Employer:** Contractor  
**Occupation:** Process/Equipment Operator  

**Narrative:**
When the crew was installing the waterline, the ground fell away from 4m trench side slopes which were not fixed. At the time, a flame cutting torch operator was doing gas-flame work in the trench. As a result of the ground falling away, he was covered by the earth. Crew members dug him out and sent him to Hospital. During transportation, the injured died without regaining consciousness.

**What went wrong:**
- The safe steepness of unfixed trench slopes required by the work execution plan for withstanding the load of machines and soil was not ensured.
- The person in charge did not check the inclination of slopes prior to the descend of workers into the trench.

**Corrective actions and recommendations:**
- Ensure safe steepness of unfixed slopes of pits and trenches for withstanding the load of machines and soil.
- Ensure safe and reliable fixation of the walls of pits and trenches.
- Find and choose safe places and protective covers for pits and trenches and installation of stairs for descend of people to the worksite.

**Causal factors:**
- Process [conditions]: Organisational: Inadequate hazard identification or risk assessment
- Process [conditions]: Organisational: Inadequate supervision
Russia, Drilling, Dec 26 2010

Number of deaths: 1  
Incident Category: Struck by  
Activity: Transport - Land

Age: 31  
Employer: Contractor  
Occupation: Transportation Operator

Narrative:
A mobile team of a Private Security Company consisting of a guard and a driver-guard were travelling in a company car. At 19:40, on an intrafield road, the driver-guard lost control of the vehicle and drove into the oncoming lane, where he collided with a truck driven by a contractor employee. As a result of road traffic accident, the guard died at the scene. The driver was delivered to Trauma Center in Nizhnevartovsk. Diagnosis: closed craniocerebral injury, fracture of the right leg, grave condition. The driver of the truck was not injured.

What went wrong:
• The driver chose the wrong driving speed (given the road and weather conditions and dark hours).

Corrective actions and recommendations:
• Familiarize the TS and Contractor’s personnel with the accident.
• Recommend Leaders of contracting organizations not to hire drivers with work experience less than 1 year.
• To carry out extra briefing for all drivers on “Transportation Safety Standard” concerning speed infringement under different weather and road conditions.
• Arrange extra training for drivers in accordance with the Technical Standard on “Transportation Safety” only by recommended providers.

Causal factors:
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment

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Iraq, Construction, Nov 30 2010

Number of deaths: 1  
Incident Category: Assault or Violent act  
Activity: Transport - Land

Age: unknown  
Employer: Contractor  
Occupation: Other

Narrative:
One person died in a security related road incident.

What went wrong:
• General insurgent threat against private security companies, possibly linked to community dissatisfaction with Contractor or its major client.
• Possible gaps in contractor management potentially allowed deviation from anticipated location and transport routes.

Corrective actions and recommendations:
• Senior management review to including Group security assessment.
• Re-audit Contractor’s start-up criteria prior to mobilization, and check start-up deviations across other contractors.
• Strengthen journey management in terms of security intelligence to contractors, and route choices.

Causal factors:
• People (acts): Inattention/Lack of Awareness: Acts of violence
Narrative:
Lowering of 7” casing job was completed. The riser (bell nipple) was being lifted by a rig floor air winch to see that the locator has been set properly on the 9 5/8” casing wellhead in order to ensure the proper landing of casing. The job was supervised by a Toolpusher and 3 rig crew members (Assistant Driller, Derrick man and Floor Man) were standing at cellar area to position the bell nipple and DSA studs with well head. During the lifting of the bell nipple, the flow line (mud return line) which was attached to the bell nipple by the dresser coupling got detached. The flow line fell on the Floor Man hitting his right leg and he fell down on his back. He was transported to Hospital immediately, but he passed away in the evening.

What went wrong:
Poor reaction condition or reaction time. Improper risk assessment. Inadequate assessment of required skills. Inadequate Training knowledge transfer. Improper design/fabrication of bell nipple. No procedure/checklist available to secure flowline. Improper design/fabrication of bell nipple. No procedure/checklist for the installation of dresser sleeve. No physical/visual indicators to show correct positioning post installation. The lifting chain was tied to the bell nipple extension. Bell nipple lifting was considered as a routine job that does not require a JSA. No direct visual contact between winch operator and crew at cellar area. Lack of awareness about potential falling of flowline. Job urgency/rush.

Corrective actions and recommendations:
• To include the securing of the flow line in the pre-spud checklist. To have a daily checklist which includes securing the flowline.
• Review bell nipple design in terms of the position and size of lifting eyes/pad eyes taking into consideration safe lifting of bell nipple. Study the feasibility of using hammer union instead of Dresser sleeve as a connecting device with the flowline.
• Prepare a procedure for proper positioning/installation of Dresser sleeve.
• Use position marks/indicators on the flow line and bell nipple extention to show the correct position of the dresser sleeve.
• Always use the proper lifting mechanism for lifting the bell nipple, such as the designated lifting holes/pad eyes.
• JSA to be conducted for the bell nipple lifting and casing hanger landing checks. To review overall rig operation and identify the tasks that do require JSA.
• Review the procedure of winch operations to include direct visual/audio contact with riggers.
• Conduct training/awareness sessions for rig crew on potential falling objects.
• To ensure contractor safety officers and HSE personnel possess adequate experience on HSE aspects related to Drilling operations.

Causal factors:
• People (acts): Following Procedures: Improper lifting or loading
• People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
• People (acts): Use of Protective Methods: Inadequate use of safety systems
• People (acts): Use of Protective Methods: Equipment or materials not secured
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
• People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
• Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
Fatal incident reports by region

Qatar, Construction, Jan 27 2010

Number of deaths: 1  Incident Category: Caught In, Under or Between  Activity: Construction, Commissioning, Decommissioning

Age: 47  Employer: Contractor  Occupation: Foreman, Supervisor

Narrative:
On Jan 27 around 2320 hours a Civil Supervisor was standing and signaling to the backhoe operator with his back towards the loading area. A few minutes later a tipper came to load mixed materials as the loader was waiting with the materials in the bucket. The tipper reversed and ran-over the Supervisor who was standing with his back to the vehicle as he was busy with giving instructions to the operator. Emergency response was activated and ambulance arrived from near by hospital and the injured was taken to the hospital and was pronounced dead on next day.

What went wrong:
- There was lack of communication between the driver and the banksman.
- There were insufficient banksmen to provide adequate direction for tipper drivers.
- The hazardous areas were not barricaded which allowed frequent contact between target and hazard. At hazardous locations where frequent movements of tippers/vehicles are there, warning instructions, do's and don'ts walkways etc not marked.
- Refresher training was not conducted for banksmen and drivers.
- Method statement, JSA do not express mandatory requirement of banksmen presence during reversing of the tipper.

Corrective actions and recommendations:
- Communication between the driver and the banksman needs to be improved.
- Provide adequate numbers of banksmen to direct tippers and drivers.
- The hazardous area needs to be barricaded, warning instructions, do's and don'ts walkways etc not marked suitably.
- Job specific training and retraining to be conducted for banksmen and drivers.
- Method statement, JSA do not express mandatory requirement of banksmen presence during reversing of the tipper which needs to be revised accordingly.

Causal factors:
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Protective Methods: Failure to warn of hazard
- People (acts): Inattention/Lack of Awareness: Lack of attention/distraught by other concerns/stress
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision

Qatar, Construction, Mar 2 2010

Number of deaths: 1  Incident Category: Struck by  Activity: Construction, Commissioning, Decommissioning

Age: 31  Employer: Contractor  Occupation: Manual Labourer

Narrative:
On 2nd March 2010, contractor crew were engaged in unloading dredged materials. At around 1400 hours, a truck driver maneuvering to offload the truck started reversing without waiting for the banksman's clearance. Banksman moved towards and into the path of the reversing truck(tipper). He was hit by the truck and run-over by the left rear wheel. Another nearby truck driver saw the incident and blew the horn to stop the reversing truck. He got off his truck and ran immediately to the front of the reversing tipper to warn the driver of the accident. The driver did not realise that he had run over the banksman who was now under the wheels.

What went wrong:
- Contractor HSE plan, JSA, Method Statement, and training modules but these are not effectively implemented at site.
- HSE Management Systems are not effectively disseminated down to lower levels of site personnel such as foremen and banksmen.
- In some instances, inexperienced personnel were given short training to perform banksmen tasks which they have not previously been exposed to.
- There was no clear traffic management specific for the work area in which the accident took place.
- Training and communication for the banksmen and drivers is not effective enough to capture all hazards associated with the job.

Corrective actions and recommendations:
- Implementation of HSE safe systems of work such as JSA, Method statement, HSE plan uniformly across the organisation.
- Improve the communications across supervisory and all workers levels.
- Selection, training and validation of banksmen prior to assignment to be reviewed.
- Revise the Method Statement and Risk Assessment to define traffic management control measures relating to truck movements and site personnel positions.
- On site hazard identification and risk assessment for each site activity and check the requirement of banksmen to avoid hazardous situations.

Causal factors:
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Protective Methods: Failure to warn of hazard
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
Fatal incident reports by region

UAE, Production, Aug 1 2010

Number of deaths: 1  
Incident Category: Struck by  
Activity: Transport - Land

Age: 48  
Employer: Contractor  
Occupation: Manual Labourer

Narrative:
While a contractor crew was returning to their camp using a Gatch road, one project vehicle driver tried to overtake another and the driver lost control. The vehicle rolled over four times, resulting in one fatality, five serious and two minor injuries to a crew of eight workers all in the same land cruiser.

What went wrong:
• Behaviour  
• Management/Supervision/Self Leadership

Corrective actions and recommendations:
• Seat belts save lives  
• Identify access tracks for work assignments and always use assigned access tracks.  
• Embed Lessons learned from Road Traffic Accidents (RTA) into company Safe Driving Document Training.

Causal factors:
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment  
• Process (conditions): Work Place Hazards: Inadequate surfaces, floors, walkways or roads  
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment

UAE, Drilling, Jan 18 2010

Number of deaths: 1  
Incident Category: Falls from Height  
Activity: Drilling, Workover, Well Services

Age: 32  
Employer: Contractor  
Occupation: Drilling/Well Servicing Operator

Narrative:
A floorman fell down from ‘monkey board’ to the rig floor. He sustained serious injuries and was evacuated by helicopter to Hospital. He was later pronounced dead.

What went wrong:
• Mental Stress  
• Behavior  
• Skill Level  
• Work Planning  
• Work Rules/Policies/Standards/Procedures  
• Communication  
• Management/Supervision/Self Leadership

Corrective actions and recommendations:
• Update procedures to include situations when operation switches from routine to non-routine.  
• If a Floorman is undergoing on job training as the Derrickman, he should be replaced with an experienced Derrickman to complete the recovery operation.  
• Vertical fall arrester must be attached to FBH before releasing counterbalance and worn at all times while on monkey board and above.  
• Develop task based competency assessment for promotion to Derrickman

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)  
• People (acts): Use of Protective Methods: Personal Protective Equipment not used or used improperly
UAE, Construction, Sep 28 2010

Number of deaths: 1
Incident Category: Falls from Height
Activity: Construction, Commissioning, Decommissioning
Age: unknown
Employer: Contractor
Occupation: Manual Labourer

Narrative:
Scaffolder working at construction yard in Abu Dhabi fell from a temporary scaffold platform located 12m above ground. As the harness that he was wearing was not clipped to an anchor point, he fell 10m receiving serious injuries.

What went wrong:
• Application of Substandard Scaffolding Methods by the Subcontractor;
• Subcontractor’s Lack of Risk Awareness and Application of Control Measures
• Lack of adequate supervision by the Contractor and the Subcontractor;
• Lack of competence of the Subcontractor(assessment and training)
• Lack of consequence and follow up for unsafe behaviours by the Contractor and the Subcontractor.

Corrective actions and recommendations:
• Scaffolding Procedures
• Risk Management
• Training & Competency
• HSSE Accountability

Causal factors:
• People (acts): Following Procedures: Violation intentional (by individual or group)
• People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
• People (acts): Use of Protective Methods: Inadequate use of safety systems
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate communication
• Process (conditions): Organisational: Inadequate supervision
• Process (conditions): Organisational: Poor leadership/organisational culture
• Process (conditions): Organisational: Failure to report/learn from events

Yemen, Production, Oct 24 2010

Number of deaths: 1
Incident Category: Caught In, Under or Between
Activity: Lifting, Crane, Rigging, Deck operations
Age: unknown
Employer: Contractor
Occupation: Manual Labourer

Narrative:
While installing flags on the sandline, a Floorman slipped into the area of the sand-line drum, resulting in head and body trauma which lead to the individual’s death.

What went wrong:
• An isolation valve existed that, when closed, prevented the drum from turning. This valve was not closed and remained open allowing the drum to turn and the resulting personnel injuries. There is no formal lock, tag and try process in use on the service rigs.
• This task had not been recognised as potentially dangerous. There is no formal risk assessment process used on the service rigs. There are no formal task observations available for this task and the inadvertent movement of the clutch was not taken into consideration.
• There are no physical guards to prevent a person from entering the drum area. A mechanical lock-out device/system was not incorporated to prevent accidental engagement of the clutch lever.
• The Floor-hands should not have been standing on the sand-line spool. The method for attaching the flags is to stand on the draw works housing, however interviews indicate that standing on the drum was not uncommon.
• The procedure (informal) requires the closing of the isolation valve. This was not followed, though there were previous STOP cards identifying this hazard.

Corrective actions and recommendations:
Process was unsafe and there were no guards. Guards have been installed on all service rigs, and a procedure change in putting flags in a sand line.

Causal factors:
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
• People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
• Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
• Process (conditions): Organisational: Inadequate supervision
Yemen, Unspecified, Oct 6 2010

Number of deaths: 1  
Incident Category: Assault or Violent act  
Activity: Office, Warehouse, Accommodation, Catering

Age: 57  
Employer: Contractor  
Occupation: Admin, Management, Support Staff

Narrative:
On 6 Oct 2010, at about 08:46 hours one of the armed security guards opened fire using an automatic weapon. As a result one contractor employee was fatally injured and one contractor employee was injured.

What went wrong:
- Security guard opened fire on contractor employee without cause
- Motive for shooting probably related to inspiration of terrorism of Al Quaida
- Contracted personnel processes insufficiently controlled

Corrective actions and recommendations:
- Armed Security personnel to be kept outside company perimeter
- Adequate control of contractor processes

Causal factors:
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Inattention/Lack of Awareness: Acts of violence

Offshore

Qatar, Drilling, Jan 9 2010

Number of deaths: 1  
Incident Category: Struck by  
Activity: Drilling, Workover, Well Services

Age: 47  
Employer: Contractor  
Occupation: Drilling/Well Servicing Operator

Narrative:
On Jan 9th, in the absence of a Derrickman, a Floorman volunteered to go to the monkey board to rack back a 5” drill pipe stand. While pulling three stands out of the hole he unlatched the pipe from the elevator. As the Driller commenced lowering the travelling block, there was a sudden slack of the winch wire causing the drill pipe to move back into the path of the descending Top Drive System (TDS). As the top drive impacted the pipe stand, the drill pipe deflected and moved towards the other side of the monkey board, creating tension on the winch wire. The Floorman was hit by both the pipe and the winch wire. The Asst. Driller went up to the monkey board, found the injured floorman in a crouched position on the drill collar’s finger board and suspended safely by the fall arrest system. The injured person had complained of pain in the abdomen, though the Rig doctor observed that there was no external injury except a red linear mark on the abdomen while monitoring the IP and he subsequently died later on.

What went wrong:
- The deceased Floorman was assigned the job of a derrickman although he had never worked as a derrickman.
- Job Safety Analysis did not address the particular risks associated with this incident.
- Derrickman activities on the monkey board are considered routine operations and hence did not require a permit to work.
  A pre-job safety meeting was conducted, however it was not documented and there was no evidence of it.
- Delay in Medivac operation and there was no medical equipment on the rig to detect internal injury.

Corrective actions and recommendations:
- Line of sight or clear vision to be maintained path of the top drive, prior to ascending/descending.
- Ensure effective two way communication system at all times and update communication procedure.
- Driller to ensure adequate manning at the rig floor at all times. Only authorised and trained personnel should be engaged in the specific jobs and with proper supervision.
- Job Safety Analysis and to ensure that it covers all potential hazards and control measures for monkey board operations.
- Medivac for any struck-by injury to head, chest and abdomen including suspected cases to be made available immediately.

Causal factors:
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Protective Methods: Failure to warn of hazard
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision
Fatal incident reports by region

Qatar, Construction, Aug 12 2010

Number of deaths: 1
Incident Category: Struck by
Activity: Construction, Commissioning, Decommissioning

Age: 44
Employer: Contractor
Occupation: Manual Labourer

Narrative:
On Aug 12th at Navy coast guard berth incident occurred on barge dredger. A crane operator was lowering down the main rope (which was entangled with auxiliary wire rope). He was lowering the main hook and two riggers were standing just below the hook to place the four leg sling on it. However, he continued to lower down the main hook block. As a result the auxiliary hoist rope came under tension and snapped very close to the wedge socket chain assembly joint and fell over the rigger who was bending over the four legs chain sling. He died on the spot due to severe head injury.

What went wrong:
- Auxiliary hoist wire rope and winch were not inspected and certified. This was mentioned on the certificate. Crane operator and riggers were working on the main rope even though it was entangled with auxiliary rope.
- The anti-two-block and safe working load indicator devices were not fitted for auxiliary hoist.
- The maintenance record of present and past for all the lifting gear tools are not being maintained
- It has been reported that the same auxiliary hoist rope snapped almost exactly in similar action on August 10, but not investigated.
- Company’s lifting equipment operational regulation not followed. No proper crew training for identification of the hazards associated with operation, safe work practices etc.

Corrective actions and recommendations:
- Lifting tools and equipment which are not certified shall not be used.
- All crane’s safe working systems e.g SLI, limit switches, anti two blocks etc. must be in fully functional and daily checks by the crane operator prior to undertaking each lifting operation.
- Investigate all nearmiss incidents and implement recommendations
- Ensure proper training is imparted to all in the use of wire ropes for clamshell operation. Adequate pre-planning and risk assessment for the lifting operation must be carried out before undertaking any jobs
- Follow Company regulations for maintaining lifting tools and equipment.

Causal factors:
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Following Procedures: Improper lifting or loading
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

North America

Onshore

Canada, Production, Oct 25 2010

Number of deaths: 1
Incident Category: Other
Activity: Transport - Air

Age: unknown
Employer: Contractor
Occupation: Other

Narrative:
An incident occurred involving an aircraft on approach to the Field airstrip. A total of 10 people were on the aircraft of which 7 were company employees, 1 contractor and 2 air crew. Emergency teams have responded and relevant authorities informed. The company’s incident management team has been mobilized and is assisting in the response and support to employees and families.

What went wrong:
- Under investigation

Corrective actions and recommendations:
- Under investigation

Causal factors:
- No causal factors allocated
## Fatal Incident Reports by Region

### USA, Unspecified, May 26 2010

**Number of deaths:** 1  
**Incident Category:** Pressure Release  
**Activity:** Maintenance, Inspection, Testing  
**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Drilling/Well Servicing Operator

**Narrative:**

A contract employee was pressure washing a vehicle using a blow out preventer test pump. The contract employee attempted to correct a low flow rate from the wash hose by cycling the discharge valve closed and opened with the pump operating. The pressure relief device was on the downstream side of the discharge valve. Upon closing the discharge valve, the piping manifold separated from the valve and struck the contract employee on his hard hat.

**What went wrong:**

- A pressure relief valve was installed incorrectly downstream of the discharge ball valve during manifold repair. The pump did not have an integral pressure relief valve
- The discharge valve was shut while the high pressure positive displacement pump was in operation
- Neither the JSA nor SOP identified the line of fire and stored energy hazards
- The discharge valve catastrophically failed
- The human factor engineering of the valve handles, instrumentation, and pump controls contributed to the employee being in the line-of-fire from the pump discharge.

**Corrective actions and recommendations:**

- Ensure pressure relief valves for positive displacement pumps are located upstream of discharge valves. Use locks and tags to prevent the pressure relief valve from being isolated while the pump is in operation
- Include in the JSA/SOP identification and mitigation of line-of-fire and stored energy hazards while operating positive displacement pumps
- Ensure Quality Assurance/Quality Control program is in place to verify piping repairs/modifications are made in accordance with company and industry standards
- Conduct a human factor engineering review of any new high pressure pumps or when modifications are made to existing high pressure pumps to minimize line-of-fire hazards.

**Causal factors:**

- People (acts): Following Procedures: Improper position in the line of fire
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Use of Protective Methods: Inadequate use of safety systems
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

### USA, Unspecified, Oct 1 2010

**Number of deaths:** 1  
**Incident Category:** Exposure Electrical  
**Activity:** Construction, Commissioning, Decommissioning  
**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Maintenance, Craftsman

**Narrative:**

A contract employee was electrocuted when a new power pole was raised prematurely and contacted an energized overhead electrical line, conducting current through the pole’s ground wire to a worker on the ground. The new power pole was being installed between two existing poles that held the energized overhead lines.

**What went wrong:**

- The JSA was vague and did not identify and document steps to deal with live electrical lines overhead
- Permit approver was not authorized to approve work. No mention of de-energizing overhead lines in the permit
- The contractor site foreman supervising the work did not coordinate task steps; crew member raised the pole before line insulators were installed.

**Corrective actions and recommendations:**

- JSA documentation and conversation should identify and provide mitigating steps for all risks of the work, with specific focus on potential for severe or fatal consequences
- Job permitting process should confirm effective work procedures exist for high-risk work. No check list or written procedures were on-site during the job
- On-site, work should be coordinated to ensure job tasks are executed sequentially to confirm all safety equipment is in place and functioning.

**Causal factors:**

- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
Safety performance indicators – 2010 data

Fatal incident reports by region

Offshore

USA, Drilling, Apr 20 2010
Number of deaths: 11
Incident Category: Explosions or Burns
Activity: Drilling, Workover, Well Services
Occupation: Drilling/Well Servicing Operator

Age: unknown
Employee: Contractor

Narrative:
• Explosion/fire.

What went wrong:
• Under investigation

Corrective actions and recommendations:
• Under investigation

Causal factors:
• No causal factors allocated

USA, Unspecified, Jul 2 2010
Number of deaths: 1
Incident Category: Explosions or Burns
Activity: Diving, Subsea, ROV
Occupation: Other

Age: unknown
Employee: Contractor

Narrative:
Contract saturation divers working from a chartered dive vessel were performing work in preparation for the deck recovery of a platform toppled during a recent hurricane. The injured party (IP) was cutting deck penetrations to facilitate the salvage recovery operation and was working at a depth of 234 feet. During underwater burning operations free oxygen is released and, due to the intense temperatures generated by the torch, hydrogen is also released as water molecules are broken down – forming a flammable environment. In this incident the vent hole in the deck plate was not at the highest point, allowing flammable vapors to accumulate. The IP apparently did not adequately check for flammable vapors before proceeding. When the IP applied the torch to enlarge an existing vent hole an explosion occurred.

What went wrong:
• Neither the IP nor the IP’s dive supervisor followed their employer’s site specific Burning Procedure. (Failure to follow Safe Work Practices and Procedures)
• The Contractor’s pre-written JSA for the job was not thoroughly reviewed against the conditions on the job to insure that it addressed all site-specific hazards. (Failure to fully identify all risks)

Corrective actions and recommendations:
• Always verify that Safe Work Practices and Procedures are followed.
• Verify that JSAs identify all potential hazards at the job site and include mitigation plans for all identified hazards.

Causal factors:
• People [acts]: Inattention/Lack of Awareness: Improper decision making or lack of judgment
• Process [conditions]: Work Place Hazards: Hazardous atmosphere (explosive/toxic/asphyxiant)
• Process [conditions]: Organisational: Inadequate hazard identification or risk assessment
• Process [conditions]: Organisational: Inadequate communication
Fatal incident reports by region

South America

Onshore

Argentina, Drilling, Jan 26 2010
Number of deaths: 2
Activity: Drilling, Workover, Well Services

<table>
<thead>
<tr>
<th>Incident Category: Struck by</th>
<th>Employer: Contractor</th>
<th>Occupation: Drilling/Well Servicing Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: unknown</td>
<td></td>
<td>Occupation: Other</td>
</tr>
<tr>
<td>Age: unknown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Narrative:
- Temporary flowline whiplash.
- A team composed of 5 persons was performing a wireline operation to recover downhole memory gauges in a recently stimulated, cleaned-up and tested well. The recovery operation had not been successful after several trials and stimulation materials were suspected to have settled above gauges lock mandrel. It was therefore decided to “vent” the well in an attempt to flush and free the tool. To achieve this the next day a temporary flare line between Xmas Tree and burn pit was hooked up (around 85 meters distance). During the flaring process a strong blast was heard and the temporary line suddenly started to whip out of control and hit the operators causing two fatalities.

What went wrong:
- Confidential

Corrective actions and recommendations:
- Confidential

Causal factors:
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision

Brazil, Production, May 11 2010
Number of deaths: 1
Activity: Production Operations

<table>
<thead>
<tr>
<th>Incident Category: Pressure Release</th>
<th>Employer: Contractor</th>
<th>Occupation: Process/Equipment Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 48</td>
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</tbody>
</table>

Narrative:
In a Gas Compression Unit, with three reciprocating gas compressors, one compressor was taken out of service for regular maintenance. The Production Operator stopped the compressor engine, opened the bypass between suction and discharge and closed the suction valve. Because he did not close the discharge valve and the check valve installed in the discharge pipe of the compressor has failed, the high pressure (70 kgf/cm²) of the discharge header was communicated to the suction side of the compressor (normal pressure 5 kgf/cm²). When the pressure reached 40 kgf/cm², the first stage suction vessel of the compressor ruptured and one of the pieces hit the Production Operator in the head, causing his death.

What went wrong:
- The Production Operator performed an inadequate set of operations for taking the compressor out of service. There was no written procedure for this and the operators used a procedure from another gas compression unit.
- A check valve failed to stop the flow of gas from the discharge header to the suction side of the compressor.
- The high pressure protection system of the compressor was inadequate to prevent the rupture of the suction vessel.
- There has been a recent change in the compressor, with significant changes in valves and instruments location, introducing significant changes in the operation. This change had not been managed.

Corrective actions and recommendations:
- Operations should be periodically audited in order to verify the existence of written and updated procedures for all critical operations. In case of absence of written and updated procedures immediate provisions shall be taken to resolve this and personnel involved should be trained as quickly as possible.
- Reinforce actions regarding operational discipline and pre-task risk assessment.
- Do not rely upon check valves operation. They are operational equipment, not safety barriers.
- Perform valid risk analysis to be sure that protection systems are adequate to prevent accidents. How preventive are they in case of a fail in one element?
- Reinforce actions for the correct understanding of changes and provisions for management of change for operations, maintenance, installation and design teams.

Causal factors:
- People (acts): Following Procedures: Violation intentional (by individual or group)
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Organisational: Inadequate work standards/procedures
Brazil, Production, Jul 3 2010

Number of deaths: 1  Incident Category: Pressure Release  Activity: Production Operations

Age: 31  Employer: Contractor  Occupation: Process/Equipment Operator

Narrative:
A pig launching station was installed in an existing six inches multiphase pipeline, in order to comply with a new regulatory issue. This was not seen as a change, so no management of change was made. There was no special planning for commissioning and pre-operating the station. The design, although based in a company engineering standard issued more than ten years ago, had a different concept when compared with similar installations at that location. Operations scheduled a series of pig passages in the pipeline to clean it prior to the passage of an intelligent pig. When performing the very first one operation of this series, the operation group perceived that the pig had moved inside the chamber away from the correct place for launching. He could not use the launcher vent valve to do so because a manometer had been installed there (the standard, which specified a vent valve and a pressure indicator at that place, was not fully observed). So, in order to move the pig within the chamber, the Production Operator opened the chamber drain valve, located opposite the vent valve, at the same position of the launcher. The pressure inside the launch chamber pushed the six inch foam pig into the two inch drain pipe and the pig was expelled at the end of the drain pipe. When this happened, there was a sudden gas pressure release at the drain pipe end, which caused the movement of the drain pipe, which was not anchored. The pipe was deformed in an arch form, hitting an Operation Auxiliary at the top of his head. In spite of the fact that the Operation Auxiliary was using a hard hat, the blow caused brain trauma, which leads to his death.

What went wrong:
• There was no management of change for the installation of a new pig launcher chamber at the pipeline. No risk assessment was made to this project.
• The launcher was different from existing launchers at that location.
• Operators have not been trained in procedures of launching and receiving pigs in installations designed based on that engineering standard, which incorporates a different configuration of equalization line.
• There was no special planning for commissioning and pre-operating the station.
• The operation was not fully performed as stated in the existing written operational procedure and the operator did not realize all possible consequences when he changed the operation.
• A technical study after the accident showed that to this particular site and launcher, pressure differential with the drain valves fully open create a jet of gas sufficient to deform the drain line, if it is not firmly anchored.

Corrective actions and recommendations:
• There was no management of change for the installation of a new pig launcher chamber at the pipeline. No risk assessment was made to this project.
• The launcher was different from existing launchers at that location.
• Operators have not been trained in procedures of launching and receiving pigs in installations designed based on that engineering standard, which incorporates a different configuration of equalization line.
• There was no special planning for commissioning and pre-operating the station.
• The operation was not fully performed as stated in the existing written operational procedure and the operator did not realize all possible consequences when he changed the operation.
• A technical study after the accident showed that to this particular site and launcher, pressure differential with the drain valves fully open create a jet of gas sufficient to deform the drain line, if it is not firmly anchored.

Causal factors:
• People (acts): Following Procedures: Violation intentional (by individual or group)
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
# Fatal Incident Reports by Region

## Peru, Drilling, Apr 27 2010

**Number of deaths:** 1  
**Incident Category:** Water related, Drowning  
**Activity:** Transport - Water, incl. Marine activity  
**Age:** 37  
**Employer:** Contractor  
**Occupation:** Transportation Operator

### Narrative:

On April 27th, 2010 a barge struck and sunk a guide boat resulting in a missing person, presumed dead.

### What went wrong:
- Inappropriate guide boat standards;
- Company Coordinator did not evaluate and approve the guide boat as per the river navigation rules prior to departure;
- Motorman crossed in front of on-coming barge;
- Guide boat engine stalls and stopped;
- Prowman could not re-start engine;
- Communications between vessels not appropriate.

### Corrective actions and recommendations:

**Global**
- Establish a process of new country entry HSE readiness assessments prior to new country startup operations.
- Analysis of a global fatigue management guideline.

**Local**
- Establish clear accountabilities for all River operations.
- Upgrade communications systems.
- Conduct a review and risk assessment of all other vessel operations and define minimum vessel and crew competency standards.
- Further revise River Navigation and Contracting Procedures based on risk assessment.
- Improve reporting (incidents, near miss, preventative maintenance, etc).
- Third party expert to review and endorse the restart of these operations.

### Causal factors:
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate communication

## Peru, Unspecified, Sep 28 2010

**Number of deaths:** 1  
**Incident Category:** Struck by  
**Activity:** Seismic/Survey Operations  
**Age:** unknown  
**Employer:** Contractor  
**Occupation:** Manual Labourer

### Narrative:

Chainsaw operator was clearing the perimeter of a Fly Camp under construction. While he was cutting a tree, a dead branch/limb fell on his head.

### What went wrong:
- Procedures not followed.

### Corrective actions and recommendations:

- Follow established procedures
- Work stop, hold points and enforcement of Administrative Controls included in procedures and clearly communicated.
- Inspect the work area to ensure safe job execution.

### Causal factors:
- People (acts): Following Procedures: Improper position (in the line of fire)
- Process (conditions): Work Place Hazards: Congestion, clutter or restricted motion
Appendix D
High potential event reports by region

Africa

Onshore

**Algeria**

**Function:** Production  
**Category:** Struck by  
**Activity:** Transport – Land

**Narrative:**
Contractor driver rolled a heavy goods transport while conducting a rig move. The transport was loaded with a power pack, generator, and container attempted to negotiate a curve in the road at speed not suitable for the load and road conditions resulting in lost control of the transport. The transport load, which was unsecured, shifted and rolled the truck over. The driver received lacerations to his hand requiring sutures.

**What went wrong:**
- The load was not secured to the transport and allowed for the load to shift while negotiating a curve in the road.
- Supervisor in the lead car was speeding and not limiting the speed of the transport.

**Corrective actions and recommendations:**
- This incident highlights the importance of ensuring that all vehicles are roadworthy
- Securing the load and driving to conditions must be enforced to prevent similar incidents.

**Causal factors:**
- People (acts): Following Procedures: Work or motion at improper speed
- People (acts): Use of Protective Methods: Inadequate use of safety systems
- People (acts): Use of Protective Methods: Equipment or materials not secured
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

**Angola**

**Function:** Production  
**Category:** Explosions or Burns  
**Activity:** Production Operations

**Narrative:**
A platform experienced a process shutdown due to a loss of all generators while switching power loads. The platform shut in as designed. During the shutdown, the high pressure compressor package suffered a gas leak which resulted in a fire inside the turbine gas compressor enclosure. There were no injuries and no oil was released.

**What went wrong:**
- Both seal oil pumps were lost due to the power outage. Per design, there is no alternative power source to drive the seal oil pump on the compressor. As a result, all seal oil drained through the compressor seals into the lube oil reservoir.
- The compressor high pressure blowdown valve failed to open as designed. This resulted in the compressor maintaining a high gas pressure in the compressor cases. High pressure in the compressor cases, with no seal oil, resulted in natural gas migrating into the compressor lube oil drain system causing an overpressure of the lube oil tank. The gas migrated out of the lube oil tank fill cap and through two blown out sight glasses as a mist of lube oil and gas, forming an explosive mixture in the turbine enclosure. These gas sources were located directly next to the engine power turbine which operates at a temperature of 800-1000°F (427-538°C)

**Corrective actions and recommendations:**
- Installation of a backup power source to ensure uninterrupted power to seal oil pumps
- Compliance tests and repairs to shutdown and blowdown valves will have detailed test procedures with pass/fail criteria. Records of these tests should be maintained to verify compliance
- Installation of redundant high pressure blowdown valves
- When repairs are required of these critical shutdown and blowdown valves such work should be completed by a third party shop with the capability to perform full function testing according to the manufacturer’s recommendations.

**Causal factors:**
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
High Potential Events by Region

Offshore

Tunisia
Function: Production
Category: Struck by
Activity: Transport – Land

Narrative:
A Contractor pick up truck driver with one passenger (Rig Crane Driver) were on the way to Company operations for regular crew change. At about 700m from the camp the car slid off the road & rolled over several times landing finally on the driver’s side.

What went wrong:
Excessive speed for local road conditions Lack of Desert Driving Training, driver was unfamiliar with the limit of his vehicle.

Corrective actions and recommendations:
Investigation done (Tripodbeta) an action plan was issued and corrective actions implemented

Causal factors:
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
• People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
• Process (conditions): Organisational: Inadequate supervision
• Process (conditions): Organisational: Poor leadership/organisational culture

Asia/Australasia

Onshore

Australia
Function: Production
Category: Caught In, Under or Between
Activity: Maintenance, Inspection, Testing

Narrative:
While using the lathe in the FPSO workshop, a mechanical technician suffered serious injuries to left and right hands, fingers/thumb and left arm when his arms were pulled into the lathe by the sleeve of his overalls. The IP tried to depress the brake with his foot but it did not depress properly because his toe was caught under the edge of the brake preventing its activation. A co-worker came to his aid and activated the emergency stop button.

What went wrong:
• Human Machine Interface – the inability of the IP to depress the brake should be reviewed for potential engineering solution. Labels need improvement. The signage on the lathe is inadequate and is not sufficiently prominent to alert workers as to the requirements when operating the machine
• Management system – Administrative controls need improvement: the Company does not have a formal set of rules for personnel when using equipment in the workshop.
• Design review: The design of the overalls with gusset sleeves potentially contributed to the incident.
• Intentional behaviour – Skills and knowledge: I.P. knew through training and experience that gloves and loose clothing should not be worn. Continued to undertake the work without amending his clothing as this was a quick routine task

Corrective actions and recommendations:
• Established work practices should be followed when using or working on rotating equipment.
• Use of workshop equipment should only be undertaken when the assistance of another person is available within the workshop.

Causal factors:
• People (acts): Following Procedures: Violation intentional (by individual or group)
• Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
• Process (conditions): Protective Systems: Inadequate/defective Personal Protective Equipment
• Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
### High Potential Events by Region

<table>
<thead>
<tr>
<th>Australia</th>
<th>Function: Production</th>
<th>Category: Explosions or Burns</th>
<th>Activity: Unspecified – other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative:</strong></td>
<td>During the routine cool-down of an LNG carrier, the “A” loading arm parted from the manifold at the emergency release coupling resulting in release of LNG and cold burns injuries to a ships crewmember.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>What went wrong:</strong></td>
<td>Management Systems – SPAC Needs Improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MIB ERC locating shear pin identified to be missing. Makers detail several warnings in their operations and maintenance manuals that it is imperative that no LNG transfers are undertaken without this shear pin in position on each device. There were no operational procedures in place to ensure the shear pin was in position.</td>
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<tr>
<td></td>
<td>• Emco Wheaton loading arm swivel No.5 found to be hydraulically locked in operation with “free float” facility compromised on all 4 loading arms. Modified hand hydraulic operating system installed incorrectly on each loading arm swivel unit (No. 5) prior to commissioning. This modification was installed without conduct of due HAZOP process resulting in the hydraulic lock on the loading arm.</td>
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<td></td>
<td>• Maintenance procedures for the LNG berth were incomplete following handover of procedures at the time of the commissioning process.</td>
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<tr>
<td></td>
<td>• Equipment Parts Defective: Mechanical deficiency – ERC coupling hydraulic interlock sequence valve found to be defective. Interlock sequence valve piston unit rear spring housing found to be oil filled allowing the interlock to move out against the clamp unit spring tension release arrangement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>• Update project controls check points to ensure that a go/no go status is implemented for delivery of critical maintenance procedures as part of handover from commissioning to operations.</td>
<td></td>
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<tr>
<td></td>
<td>• Ensure management of change process is utilised for all modifications to equipment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Causal factors:</strong></td>
<td>• Process (conditions): Tools, Equipment, Materials &amp; Products: Inadequate design/specification/management of change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Process (conditions): Tools, Equipment, Materials &amp; Products: Inadequate maintenance/inspection/testing</td>
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<tr>
<td></td>
<td>• Process (conditions): Organisational: Inadequate work standards/procedures</td>
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<tr>
<td></td>
<td>• Process (conditions): Organisational: Inadequate hazard identification or risk assessment</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Process (conditions): Organisational: Inadequate communication</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>China</th>
<th>Function: Construction</th>
<th>Category: Caught In, Under or Between</th>
<th>Activity: Transport – Land</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative:</strong></td>
<td>A truck was delivering interconnecting concrete beams to the retaining wall area. While traveling down the hill to the retaining wall site, the truck’s front wheel sank into a soft spot on the edge of the road. The driver had a couple of workers fill in the soft spot with rocks and then the truck proceeded to drive down the hill. As the truck’s rear wheel went through the soft spot, the wheel sunk due to the weight of the concrete beams, and tipped the back of the truck causing some of the concrete beams to fall. One of the workers who had placed the rocks in the soft spot was struck by and pinned between the beams and the soft hillside. The beams were lifted off the worker and he was taken to the hospital. Injured person suffered multiple fractures.</td>
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</tr>
<tr>
<td><strong>What went wrong:</strong></td>
<td>• Supervision oversight of project less than adequate</td>
<td></td>
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<tr>
<td></td>
<td>• Road base was not designed for the weight loads that were being transported on it</td>
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<td></td>
<td>• JSA did not adequately cover the task at hand</td>
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<tr>
<td></td>
<td>• Understanding of risk needs improvement</td>
<td></td>
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</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>• Provide follow up JSA training to HES Reps and PICs in proper JSA preparation and routine field review expectations</td>
<td></td>
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<tr>
<td></td>
<td>• Contractor to provide installation plans (compaction, grade, levelness, etc) for future temporary roads.</td>
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<tr>
<td></td>
<td>• Contractor develop a plan/schedule to provide follow up JSA training for front line supervisory personnel and education of all site personal in the use of JSAs and integration into Tool Box meetings</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Develop and implement a site vehicle/driver program including a driver card or trip card and vehicle specific inspection requirements administered by contractors and spot checked by company representatives.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Causal factors:</strong></td>
<td>• Process (conditions): Tools, Equipment, Materials &amp; Products: Inadequate design/specification/management of change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Process (conditions): Work Place Hazards: Inadequate surfaces, floors, walkways or roads</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Process (conditions): Organisational: Inadequate training/competence</td>
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<tr>
<td></td>
<td>• Process (conditions): Organisational: Inadequate work standards/procedures</td>
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<tr>
<td></td>
<td>• Process (conditions): Organisational: Inadequate communication</td>
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</tbody>
</table>
# High Potential Events by Region

## India

**Function:** Drilling  
**Category:** Struck by  
**Activity:** Drilling, Workover, Well Services

**Narrative:**
During circulating the driller was picking the topdrive up when the brake released causing the topdrive to drop, uncontrolled, for approximately 8 metres until the pipe handler came to rest on the rotary table. The travelling block was hanging loose over the side of the topdrive when everything came to rest.

**What went wrong:**
- Inadequate Job Planning and Risk assessment  
- Non availability of Safe Work Practices

**Corrective actions and recommendations:**
- System to be developed for adequate Job Planning, Risk Assessment and Tool box talks  
- All the existing TRAs to be reviewed, new TRAs to be developed as required, and to be authorised.  
- System to be established for periodic and pre-use checks of Portable Equipment

**Causal factors:**
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

## India

**Function:** Construction  
**Category:** Explosions or Burns  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
A contractor crew member was assigned to carry out welding work on a Flow Arm from the header to the cellar pit. As gas leaked from Annulus B- second isolation 2.1/16” Diameter downstream flange, it became ignited, due to contact with the spatters resulting from welding. The fire was immediately extinguished. Nobody received any injury as other personnel working in the cellar pit evacuated the area immediately.

**What went wrong:**
- Poor housekeeping.  
- Improper supervision.  
- Improper gas monitoring.

**Corrective actions and recommendations:**
- Ensure all project construction works under an Operations PTW.  
- Prior to works starting there must be a check made of the cleanliness of the work area.  
- Additionally the cellar pit area must be thoroughly checked to ensure that no gas is present.  
- There must be a dedicated supervisor present continuously during the period of the works.

**Causal factors:**
- Process (conditions): Organisational: Inadequate supervision

## India

**Function:** Construction  
**Category:** Exposure Electrical  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
A contractor electrician opened the lighting power DB in the morning to carry out the balance electrical job. Upon opening the power inlet side of the panel he identified that part of the panel was live. He immediately closed the cover and communicated the problem to his Engineer.

**What went wrong:**
- Lack of control – Failure to follow permit to work system.  
- Lack of supervision.

**Corrective actions and recommendations:**
- Implementation of PTW system on all project electrical works.  
- Implementation of Lock-Out and Tag-Out (LOTO).  
- Commissioning of access control system for all substations.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)  
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation  
- People (acts): Inattention/Lack of Awareness: Fatigue  
- Process (conditions): Organisational: Inadequate work standards/procedures  
- Process (conditions): Organisational: Inadequate supervision
<table>
<thead>
<tr>
<th>India</th>
<th>Function: Construction</th>
<th>Category: Exposure Electrical</th>
<th>Activity: Construction, Commissioning, Decommissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High potential events by region</strong></td>
<td></td>
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<td></td>
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</tbody>
</table>

**India**

**Function:** Construction  
**Category:** Exposure Electrical  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
An excavator was moving from the ROU to the access road to reach a maintenance check point. Due to a lack of visibility/supervision its boom touched a 440V live overhead powerline lying across the ROU, resulting in an electric spark but no injury or damage.

**What went wrong:**
- Working in dim light
- Non-availability of adequate equipment (short bunting pole)
- Operating equipment without authority and supervision

**Corrective actions and recommendations:**
- Dedicated supervisor should be available at site during any activity.
- Flag man should be available with the excavator while crossing OHPLs.
- Bunting pole should be provided to required height after proper survey.

**Causal factors:**
- Process [conditions]: Organisational: Inadequate supervision

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<table>
<thead>
<tr>
<th>India</th>
<th>Function: Construction</th>
<th>Category: Struck by</th>
<th>Activity: Transport – Land</th>
</tr>
</thead>
</table>

**Narrative:**
Approx 4-5km from the pipeyard the truck encountered a road vehicle overtaking dangerously which in turn caused the truck driver to take evasive action and brake severely. At this point the truck was on the verge of crossing a river bridge. The consequence of the emergency action by the truck driver caused the truck to “jack-knife”, forcing the tractor unit through the bridge parapet coming to a halt with the tractor unit suspended from the trailer unit which remained partially on the highway. There were no injuries requiring treatment to the truck driver or assistant.

**What went wrong:**
- Inadequate maintenance of the vehicle.
- Lack of supervision.

**Corrective actions and recommendations:**
- Ensure proper checking and inspection of all the vehicles.
- Defensive drivers training to the drivers.

**Causal factors:**
- Process [conditions]: Organisational: Inadequate work standards/procedures
- Process [conditions]: Organisational: Inadequate supervision

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<table>
<thead>
<tr>
<th>India</th>
<th>Function: Construction</th>
<th>Category: Water related, Drowning</th>
<th>Activity: Construction, Commissioning, Decommissioning</th>
</tr>
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</table>

**Narrative:**
While loading a rack of gas bottles on to a boat, the boat landing pontoon capsized and two contractor workers jumped into the water. They were retrieved safely.

**What went wrong:**
- Inadequate planning and procedures.
- No risk assessment conducted.

**Corrective actions and recommendations:**
- Management of Change procedure to be incorporated.
- A procedure to be made for transfer of equipment and personnel through the finger jetty.
- Risk assessment to be conducted.

**Causal factors:**
- People [acts]: Following procedures: Improper lifting or loading
- Process [conditions]: Organisational: Inadequate work standards/procedures
- Process [conditions]: Organisational: Inadequate hazard identification or risk assessment
High Potential Events by Region

India

Function: Unspecified
Category: Struck by
Activity: Transport – Land

Narrative:
While taking a left turn, the trailer met with an accident. The road conditions were muddy and slushy because of recent rains and the trailer skidded and overturned.

What went wrong:
- No Defensive Driving training provided to the drivers.
- Poor implementation of Road safety procedures.
- Inexperienced driver.
- Unsafe driving by the trailer driver.

Corrective actions and recommendations:
- Road risk assessment to be carried out.
- Journey Management Plan to be followed.

Causal factors:
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

India

Function: Unspecified
Category: Struck by
Activity: Transport – Land

Narrative:
A Crude oil tanker toppled over on the left hand side of the road. The driver lost control in an attempt to avoid a buffalo which came rushing on to the road.
The driver and the co-driver escaped unhurt. Leakage reported from hatch cover.
The vehicle was a non VTS vehicle.

What went wrong:
- Poor journey management planning.
- Driver fatigue.
- Lack of frequent road safety checks on tankers.

Corrective actions and recommendations:
- Ensure proper rest between 0100 AM to 0500 AM for drivers.
- Stringent checks on tanker fitness before loading.
- Ensure adequate control measures are in place.
- Install road sign at accident prone areas, between high risk prone areas.

Causal factors:
- People (acts): Inattention/Lack of Awareness: Fatigue
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision

India

Function: Unspecified
Category: Struck by
Activity: Transport – Land

Narrative:
A trailer was carrying the Rig engine (generator pack). About 1km before the destination the driver was negotiating a curve and the vehicle rolled over.

What went wrong:
- Inadequate leadership/Supervision.
- No HSE/ road safety induction given to the driver or helper.
- No monitoring and confirmation of driver experience and competence.

Corrective actions and recommendations:
- Robust contractor management process.
- A standard operating procedure (SOP) for rig move by road with all HSE checks and audits.

Causal factors:
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
**High Potential Events by Region**

<table>
<thead>
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<th>Activity: Transport – Land</th>
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<tbody>
<tr>
<td>India</td>
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**Narrative:**
Contractor Water tanker toppled on the right hand side on the storm water channel. The tanker was transferring water from the back wash pit to the Evaporation Pit. In an attempt to avoid a speed breaker on the road, the tanker driver tried to manoeuvre from the extreme right side of the road hardly six inches away from the storm water channel. Since the tanker was loaded, the loose soil and channel wall gave way, the tanker toppled over on its right hand side on to the storm water channel.

The driver escaped unhurt. The water tank of the tanker developed a leak on the right side due to the impact and the drain channel wall developed cracks at the incident spot.

**What went wrong:**
- Lack of control.
- Lack of supervision.
- Lack of communication.

**Corrective actions and recommendations:**
- Obtain task specific Work Permit including JSA for all non routine jobs before executing any job.
- Adequate close supervision to be deployed.
- Ensure that the systems and procedures are communicated down the level to the contractor.
- Periodic follow-up to verify the implementation of such procedures.

**Causal factors:**
- Process [conditions]: Organisational: Inadequate communication
- Process [conditions]: Organisational: Inadequate supervision

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**Narrative:**
Driving towards the rig site in the hours of darkness, the vehicle swerved to avoid a buffalo and the driver lost control of the vehicle as the vehicle left the road and rolled over several times.

**What went wrong:**
- Over speeding of the vehicle in the dark on poor road condition.
- Lack of routine inspection and no vehicle tracking system (VTS) installed.
- No street light and total darkness.

**Corrective actions and recommendations:**
- All call out vehicles engaged for more than one week shall have VTS.
- Training programme on Road Safety and Defensive Driving to be conducted.
- Road Transport Safety Officer should be appointed for imparting training.
- Driver must be instructed to follow Road Transport Safety Policy.
- Monitoring of a vehicle is to be done.

**Causal factors:**
- People [acts]: Following Procedures: Violation unintentional (by individual or group)
- Process [conditions]: Work Place Hazards: Inadequate surfaces, floors, walkways or roads
- Process [conditions]: Organisational: Inadequate training/competence

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**Narrative:**
A loaded Crude Oil Tanker on its way to deliver the crude oil, rolled over on its right side from a bridge. The front right tyre had burst. The driver lost control of the vehicle and hit the right side wall of the bridge and rolled over almost 10-12 feet down the bridge. The driver sustained injuries to his hands and legs. The co-driver escaped unhurt. Approximately 8-10 kl of Oil leaked from the rear bottom side of the tank.

**What went wrong:**
- Lack of Capability (physical, mental etc) – Mental fatigue due to lack of proper rest and rejuvenation.
- Inadequate system/controls to ensure distribution of driving hours between two drivers on tankers and adequate rest periods.
- Inadequate identification of hazard due to effects of too many trips without regular and meaningful rest or break.

**Corrective actions and recommendations:**
- Both the drivers on the tanker shall be equally experienced and competent.
- Weekly off to be provided to the drivers.
- Suitable System should be implemented to ensure driver rest periods are complied and that no driver without mandatory “Defensive Driving” Training is allowed to drive/co-drive the tankers.

**Causal factors:**
- No causal factors allocated
## High Potential Events by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Function: Production</th>
<th>Category: Falls from Height</th>
<th>Activity: Maintenance, Inspection, Testing</th>
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<tbody>
<tr>
<td>Pakistan</td>
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<tr>
<td><strong>Narrative:</strong></td>
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<td></td>
<td>On May 2, 2010, at around 1915 hours, at the well site, a moveable work platform overturned when a Company well head operator was descending from it as a result he sustained two minor abrasions on his left shin and one laceration on heel.</td>
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<td><strong>What went wrong:</strong></td>
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<tr>
<td></td>
<td>• Inadequate Tools, Equipment &amp; Material</td>
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<td></td>
<td>• Inadequate Engineering</td>
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<tr>
<td></td>
<td>• Incidents and Accidents (Inadequate tracking of related hazard reported before the incident took place)</td>
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<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
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<tr>
<td></td>
<td>• Discontinue use of movable work platform where fixed/permanent platform can be used</td>
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<tr>
<td></td>
<td>• Conduct survey of Platform and Ladders at Well Site to verify compliance with relevant standards</td>
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<tr>
<td></td>
<td>• HSE inspections should include inspection of suitable working surfaces</td>
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<td><strong>Causal factors:</strong></td>
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<tr>
<td></td>
<td>• People [acts]: Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products</td>
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<tr>
<td></td>
<td>• Process [conditions]: Tools, Equipment, Materials &amp; Products: Inadequate/defective tools/equipment/materials/products</td>
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<tr>
<td><strong>Narrative:</strong></td>
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<td></td>
<td>On March 17, 2010 around 1330 hours, a recording cable pick-up vehicle flipped over on its side at a road bend on black top road. The driver suffered minor abrasions to his left cheek, arm and leg.</td>
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<tr>
<td><strong>What went wrong:</strong></td>
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<tr>
<td></td>
<td>• Driving too fast for the road condition</td>
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<td></td>
<td>• Failure to follow procedure</td>
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<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
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<tr>
<td></td>
<td>• Contractor audit with special emphasis on Transportation safety needs to be conducted</td>
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<td></td>
<td>• Contractor should arrange certification training session for their drivers</td>
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<td><strong>Causal factors:</strong></td>
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<tr>
<td></td>
<td>• People [acts]: Following Procedures: Work or motion at improper speed</td>
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<td></td>
<td>• People [acts]: Inattention/Lack of Awareness: Improper decision making or lack of judgment</td>
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<td>• People [acts]: Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress</td>
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<td>• Process [conditions]: Organisational: Inadequate work standards/procedures</td>
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<tr>
<td><strong>Narrative:</strong></td>
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<td>On August 15, 2010, at around 1345 hours, a contractor ambulance rolled over on the access road about 3 km before the well site. Two people were travelling in the vehicle and one of them sustained abrasions and sprain injuries to his right hand and he was referred for assessment to a hospital. After primary care he was discharged and resumed his duty. Investigation team formed and investigation underway.</td>
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<tr>
<td><strong>What went wrong:</strong></td>
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<tr>
<td></td>
<td>• Inadequate leadership/supervision</td>
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<td></td>
<td>• Inadequate work standards</td>
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<td></td>
<td>• Inadequate guards or barriers</td>
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<td></td>
<td>• Poor control of subcontractor</td>
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<td></td>
<td>• Improper motivation</td>
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<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
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<tr>
<td></td>
<td>• Contractor supervision responsibilities boundaries for field &amp; projects should be defined</td>
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<td></td>
<td>• Periodic survey of roads should be planned</td>
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<td></td>
<td>• Contractor audit to be conducted with special emphasis on transportation</td>
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<td></td>
<td>• Meeting with Contractor Management for the use of vehicles/equipment</td>
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<td></td>
<td>• Contractor should arrange certification training session for their drivers by Company recommended Training company. Company to arrange “Train the Trainer” course for their Project HSE advisors and coordinators so that they are authorized to certify contractor drivers</td>
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<td></td>
<td>• Driver qualification criteria to be developed for the projects</td>
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<td></td>
<td>• Training session on Incident Reporting &amp; Medical Emergency/Evacuation to be conducted for contractors line Management</td>
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<tr>
<td><strong>Causal factors:</strong></td>
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<td>• Process [conditions]: Organisational: Inadequate supervision</td>
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<tr>
<td></td>
<td>• Process [conditions]: Organisational: Poor leadership/organisational culture</td>
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</table>
**High Potential Events by Region**

**Papua New Guinea**  
**Function:** Production  
**Category:** Pressure Release  
**Activity:** Production Operations

**Narrative:**  
Deviation from Barrier Policy when investigating Back pressure Valve (BPV).

**What went wrong:**  
- Unclear of OSL well work procedures.  
- BPV procedure & JHA not accurate/insufficient.  
- Uncertainty over well barriers.

**Corrective actions and recommendations:**  
- Well Services specific induction is required to ensure all new personnel are fully aware of requirements (General HSE induction is insufficient).  
- Tighter direct supervision and control is required over new personnel and existing personnel in less familiar areas until competence levels are confirmed.

**Causal factors:**  
- People (acts): Following Procedures: Violation unintentional (by individual or group)  
- Process (conditions): Organisational: Inadequate training/competence  
- Process (conditions): Organisational: Inadequate work standards/procedures  
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

**Papua New Guinea**  
**Function:** Construction  
**Category:** Water related, Drowning  
**Activity:** Transport — Water, incl. Marine activity

**Narrative:**  
A 4x2 metre flat bottomed punt used by the Oil Spill Response Team sank while deploying 3 new buoys along the export line in the river where the shipping lane meets the export line.

**What went wrong:**  
- Inadequate procedures/procedures not followed.  
- Supervisors were inexperienced. There was a failure to ensure suitable procedures were in place and followed.

**Corrective actions and recommendations:**  
- Always follow the Company Risk Assessment Processes and implement actions identified from these.  
- Supervisors must be vigilant in identification of risks, stopping the job and addressing issues before recommencing work.  
- Correct selection of equipment must be carried out for tasks. If correct equipment isn’t available then task should not commence.  
- Boating activities is a high risk task which has specific hazards associated. These must always be considered and acted on and subject matter experts consulted.

**Causal factors:**  
- People (acts): Following Procedures: Violation unintentional (by individual or group)  
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products  
- People (acts): Use of Protective Methods: Failure to warn of hazard  
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment  
- Process (conditions): Organisational: Inadequate work standards/procedures  
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment  
- Process (conditions): Organisational: Inadequate communication  
- Process (conditions): Organisational: Inadequate supervision
High Potential Events by Region

Papau New Guinea
Function: Unspecified
Category: Falls from Height
Activity: Maintenance, Inspection, Testing

Narrative:
Three helicopter mechanics were observed working in and around the front and rear props of a Chinook Helicopter with inadequate fall protection measures in place. This was 8-9 metres off the ground. No incident or accident occurred at the time of observation.

What went wrong:
Non-conformance with HS-OSP-PR-003 ‘Procedure for safe work at height’.

Corrective actions and recommendations:
• Crews assigned to the helicopter that is based in the hangar will conduct all maintenance utilizing the work platforms. The pre-flight, 6 hour levels check (if required) and the post flight levels check will be performed as usual without the aid of the work platforms.
• Aircraft working from remote locations, or from helipads not equipped with work platforms, will return to the hangar if possible for all heavy maintenance (that which requires a crane).
• Crews working at remote locations or from helipads not equipped with work platforms will be allowed to perform the required inspections and light maintenance utilizing the platforms which are built into the helicopter.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate communication
• Process (conditions): Organisational: Inadequate supervision

Papau New Guinea
Function: Unspecified
Category: Other
Activity: Transport – Air

Narrative:
Main sliding door of helicopter slid open when helicopter lifted off Heli-pad. The Pilot immediately re-landed and the door was re-shut and locked.

What went wrong:
Procedure not followed. Loadmaster was not present at control helipads to assist passengers, handle baggage and open and close doors.

Corrective actions and recommendations:
• Ensure OSL Aviation Loadmasters are fully briefed on requirements and are present for all landings at Ridge
• Prior Planning of tasks to be re-iterated when receiving visitors, to ensure all requirements are in place. For landings at Ridge.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
• Process (conditions): Organisational: Poor leadership/organisational culture
**Narrative:**
A truck and trailer fell into the river when the ramp restraining chains failed as it was reversing off the ferry.

**What went wrong:**
- Equipment failure – Ramp extension was damaged by truck exiting the ferry. This was not identified until the ferry moved off. Ramp extension dragging in water affects the ability to control the vessel while making its way across.
- Identification of changed conditions – Failure to identify significance of changed conditions. Correct decision was made to return to south bank with damaged ramp extension. No communication or notification between ferry driver and Area Supt. Risk Assessment, SWP and Step Back 5 x 5 were not carried out.
- Access & Egress – Steep approach ramps and no anchor point for ferry.

**Corrective actions and recommendations:**
- When there is a change of conditions personnel in charge of work must act appropriately and within their level of authority. Appropriate action needs to be implemented such as notification to relevant personnel and one up supervisor.
- Implement regular PM/Inspection of extension Ramps.
- Review Ferry Operating Manual and incorporate instructions for changed conditions, loading and unloading and weight distribution of ferry.
- Reinforce use of correct lines of notification and communication to Area Supt when there are changed conditions to ferry operation.
- For any changed conditions to operations Risk Assessment, Standard Working Procedures, Job Hazard Analysis, and Step Back 5 X 5 as appropriate are to be used by the personnel.
- Review steepness/angle of access ramps and if practical reduce steepness.
- Review anchor points for ferry so that it could be secured when loading or unloading.

**Causal factors:**
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Use of Protective Methods: Equipment or materials not secured
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Work Place Hazards: Inadequate surfaces, floors, walkways or roads
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
**High Potential Events by Region**

**Offshore**

**Australia**

- **Function**: Production
- **Category**: Struck by
- **Activity**: Lifting, Crane, Rigging, Deck operations

**Narrative:**
On August 20th 2010 the aft and forward deck cranes of an FPSO were derated in capacity by 30% and required replacement of main hoist and luff wire ropes. During the risk assessment process it was noted by the work team the rope was terminated at the main hoist drum using a ‘Chinese finger’ or ‘sock’. This has not been seen before as a termination method by members of the work team; a sock usually being used to haul a new rope onto a crane. Typical terminations used clamps or sockets and in these instances ‘industry practice’ is to also retain 3 wraps on the main hoist drum when fitting the come-along. These 3 wraps included the length of the termination sock. It was considered by the work team the sock would be capable of holding the weight of the rope being replaced and to attach the come-along when 3 wraps were left on the drum.

On Sept 17 during the scheduled winch drum wire rope change on the aft crane, an incident occurred when the last 80m of the rope that was being replaced, unspooled off the winch drum and fell approx 30m onto the deck. Two crane technicians working on the deck were able to move out of the way, there were no injuries to people and no damage to plant or equipment.

**What went wrong:**
- Preventive Maintenance: Maintenance schedules of the cranes resulted in the cranes being de-rated by 30%. This resulted in urgent work to replace the ropes before November 2010 shutdown.
- Procedures Wrong: The method of installation for the sock was not recorded. Clarification was sought from the manufacturer after the incident, resulting in the same sock installation as existed prior to the incident - particularly an untensioned sock
- Procedures were not consistent and didn’t reflect the steps to be taken in the task of replacing wire rope.
- Risk Assessment Process not adequate:
  - The work team did not review with appropriate technical authority when deviation from standard procedures.
  - Risk Assessments and HIRA are generic and did not detail specific precautions agreed to by the work team.

**Corrective actions and recommendations:**
The findings of this event have implications for other Facilities/Projects which use sock terminations to fix wire rope to drums. Actions deemed to be of high benefit will be recommended for implementation on facilities:
- Ensure method of installation for crane wire rope terminations are accurately recorded.
- Ensure procedures are consistent and reflect the appropriate steps to be taken in the task of replacing wire ropes including for the controlled release of stored energy at height.

**Causal factors:**
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
**Australia**

**Function:** Drilling  
**Category:** Struck by  
**Activity:** Drilling, Workover, Well Services

**Narrative:**
At 06:52, Tuesday 17th August the travelling block of the Top Drive on the main drilling side collided with the V-Door Machine (VDM). The VDM was then carried along with the Top Drive some distance up the derrick before falling back toward the Drill Floor. As the VDM fell, it was hindered by several factors, most notably the restraining cables (which parted under shock loading), the friction of the wheels against the tracks and a collision with the Upper Guide Arm (UGA).

None of the three people working in the immediate area were injured during the incident although debris was propelled into the area in which they were located.

**What went wrong:**

The circumstances of the incident were not anticipated from the outset by the organisations involved.
- Design of the multi-machine control mode is not fail safe in all modes of operation.
- The commissioning and handover process failed to identify the factors that enabled the collision embedded in the control logic of the equipment concerned.
- The post installation handover process concluded without the program issues of tool failure and the subsequent action of the VDM contained in the program being identified as a concern. Evidence of a post installation testing regime in accordance with procedures could not be found.
- The Operators were not clear on the action to take following a confusing alarm message being generated as a result of a complex system issue. This resulted in no action being taken to prevent collision.
- Although not a direct factor in this case, even if a conflict had been recognised by the ACS, the signal to stop would have been ignored by the software controlling the draw-works.

**Corrective actions and recommendations:**
- It would appear that the programs controlling the VDM and the ACS contain logic that would promote the collision under certain circumstances, or at least in some cases, not prevent collision.
- Despite the post installation testing and handover process, these issues remained unresolved until the circumstances present on 17th August caused the collision under the control of the programmable control system. It should be noted that the system operated as programmed, there were no control system logic faults involved in the collision.
- Actions required to be performed by operators were not understood due to complex system issues and the necessary corrective actions were not performed to avert the collision. The logic of the control system passed through the post installation testing and handover process undetected although many interviewees stated they found this hard to believe.
- The investigation team concluded that similar logic issues may be present in other control systems on the rig and a recommendation has been made to correct this matter.

**Causal factors:**
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices

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**Bangladesh**

**Function:** Production  
**Category:** Pressure Release  
**Activity:** Production Operations

**Narrative:**
Pressure testing up to 5000psi was carried out without a permit to work (PTW) in place. The area for the pressure test was not barricaded.

**What went wrong:**
- Barriers were removed due to poor communication.
- Lack of competence.
- Lack of supervision during shift change.
- Permit to work was incorrect for task being performed.
- Pressure gauge on pump discharge defective.

**Corrective actions and recommendations:**
- A ‘safety’ moment to be conducted at each shift handover by a crew member.
- Only competent personnel to carry out task in future.
- All permits to work relating to well intervention to be countersigned by WSS.
- Revised pressure testing JHA to mitigate the lack of over pressure protection device on the pump and lubricator.
- During shift handover the work will be suspended and made safe. After handover the incoming shift will apply PTW and reassess the situation before starting work.
- When work in progress and it is not possible to stop during shift handover, the incoming crew together with the team leader should go out to site and takeover at site.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Use of Protective Methods: Disabled or removed guards, warning systems or safety devices
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
**High Potential Events by Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>Function</th>
<th>Category</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Unspecified</td>
<td>Explosions or Burns</td>
<td>Construction, Commissioning, Decommissioning</td>
</tr>
</tbody>
</table>

**Narrative:**
“Ocean petroleum 161” platform was towed away from offshore location. At the beginning of towing, the main power generator room was burning. The fire lasted four hours. The direct economy loss is 480 million RMB. The burning process is when a worker pumped diesel to diesel daily tank, the diesel was ejected from manhole because tank was full, and the diesel was ejected to hot surface of generator. This caused burning.

**What went wrong:**
- The overfall outlet of diesel daily tank was flanged in construction. When tank was full, the diesel can’t overall.
- The rubber on manhole was shed off, and floated on surface of diesel. With diesel level going up, the rubber blocked breathing outlet of diesel daily tank.
- The worker pumped too much diesel to diesel daily tank.
- The hot surface of generator was not insulated.

**Corrective actions and recommendations:**
- The generator’s hot surface must be effectively insulated.
- Improve construction quality.
- Regularly check all kinds of flexible connection to prevent lude oil, cool water and diesel leak.
- Strengthen the training of employee.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- People (acts): Inattention/Lack of Awareness: Fatigue
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision

<table>
<thead>
<tr>
<th>Indonesia</th>
<th>Function</th>
<th>Category</th>
<th>Activity</th>
</tr>
</thead>
</table>

**Narrative:**
A technician was fixing soundproofing foam inside a vent chimney (confined space) using glue while welding work was performed nearby. Glue vapors were ignited by spark and fire set in the confined space. The technician evacuated via the vent chimney while crew workers were extinguishing the fire. He suffered burns (1st to 3rd degree) on his head, hands and legs.

**What went wrong:**
- Lack of risk assessment of work to be performed and compatibility with simultaneous works.
- Lack of work organisation, coordination and supervision.
- Lack of safety awareness.

**Corrective actions and recommendations:**
- Work management system should be implemented to ensure risk assessment and implementation of precautions (permit to work, simultaneous jobs, pre-job meeting, work planning and coordination)
- Worker should be adequately qualified and trained to perform the job.
- Management responsibilities should be clearly identified.
- Management of hazardous materials on site should be implemented (storage, distribution, and use).

**Causal factors:**
- People (acts): Use of Protective Methods: Failure to warn of hazard
- People (acts): Use of Protective Methods: Personal Protective Equipment not used or used improperly
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Work Place Hazards: Hazardous atmosphere (explosive/toxic/asphyxiating)
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
**High Potential Events by Region**

<table>
<thead>
<tr>
<th>Indonesia</th>
<th>Function: Production</th>
<th>Category: Explosions or Burns</th>
<th>Activity: Maintenance, Inspection, Testing</th>
</tr>
</thead>
</table>

**Narrative:**
At 13:00 hrs a senior production crew were working to refill Emulsatron RL 6321, a flammable chemical into a daily tank from drum by opening the valve of connection hose with a small stream and using elevation method. The location of the daily tank was close to one of the open drain line access points on the main deck. At the same time Welders start working to joint a 4” open drain line underneath the main deck. A pop sound was heard at 15:00 hrs, all concerned tried to find the source the sound and found a small fire in the chemical tank area. The small fire were safely extinguished at 15:02 hrs, by production and safety team using a portable CO₂ extinguisher (1ea). The fire could have spread due to chemical drums in surrounding area.

**What went wrong:**

**Unsafe Act**
- Following procedure (Violation by Group)
  - Toolbox meeting wasn’t participated by all concerned
- All POB did not coordinate each other on starting/switching/moving job

**Use of Protective Methods (Disable guards-warning system-safety devices)**
- Safety did not flush the drainline continuously during hotwork

**Inattention/Lack of Awareness (Improper in decision making or lack of judgement)**
- Production did not closely monitor the chemical refilling causing chemical overflow without notice

**Unsafe Condition**
- Tools, Equipment Vehicle (Inadequate equipment)
  - Some parts of chemical drum line were leaking
- Behaviour (Inadequate identification of critical safety behaviour)
  - All crews were not aware that a toolbox meeting must be conducted to discuss the job detail of each group and its relation to others
- Communication (Inadequate communication between workgroups)
  - Among groups did not communicate/coordinate every point of job, movement and time execution.
- Management/Supervision/Employee Leadership (Inadequate identification of job hazards)
  - Production did not closely monitor the chemical refilling causing chemical overflow without notice
  - Safety did not flush the drainline continuously during hotwork
- Tools & Equipment (Inadequate assessment of needs and risk)
  - There were few open space to air from chemical skid

**Corrective actions and recommendations:**
- Flushing the drain line to clean up spill of chemical inside the line
- Isolate the leaking part of chemical tank
- Closely monitor implementation of section safety meeting, toolbox meeting and job coordination among groups
- Meeting to conduct toolbox meeting (purpose & methods)
- Meeting on hazardous chemical handling
- Repair and replace the chemical skid

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
### Indonesia

**Function:** Drilling  
**Category:** Pressure Release  
**Activity:** Drilling, Workover, Well Services

**Narrative:**
After drilling of the 16" shallow gas phase, the 13 3/8" casing got stuck 300m off the bottom; consequently, the drilling program was altered when the decision was taken to cement in place the 13 3/8" casing and followed by well head contingency procedure including cold cutting. As a consequence a 23m stick-up of 13 3/8" casing, full of mud, was standing above the wellhead which had to be cut following the successful cementing of the casing. It is supposed that thermal expansion due to heat (cement setting-up and formation temperature) caused over-pressure inside the casing. As a consequence it prematurely parted before being fully cut. The mud was projected, injuring the eyes of one of the technicians standing close by. The Weatherford Casing Over-Drive System (used to run casing) is equipped with valves which were left closed during the 19 hours prior to the cutting. These prevented mud inside casing from venting as expected. It was the first time that cold cutting was performed with the Casing Over-drive System connected to the string.

**What went wrong:**
- Failure to recognize a situation at risk at all levels:  
  - from the creation of drilling program to cold-cutting execution,  
  - lack of understanding of “new system” (overdrive), poor development of contingency procedure, multiple contractors concentrating on their area.  
- Safety management gaps prevented “warnings” (failure of bridging document, work permit system).  
- False sense of security due to “routine” operation.

**Corrective actions and recommendations:**
- General safety alert (to Company and Contractor) should be issued regarding the risk of trapped pressure during similar operations.  
- Job Safety Analysis for all operations using casing drive systems should include risk of potential trapped pressure.  
- Any cold cutting operation performed should be executed and controlled under the Host Rig’s Permit to Work System and accompanied by specific Job Safety Analysis or hazard analysis to control the risks.  
- Well Construction Management should re-enforce site HSE Manager and support teams alertness in case of any changes, deviation from original drilling program.  
- The cold cutting procedure should specify:  
  - “offset” or eccentric cut to create a preliminary leak to empty the casing,  
  - required additional PPE (e.g. face shield/goggles).

**Causal factors:**
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products  
- People (acts): Use of Protective Methods: Failure to warn of hazard  
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress  
- Process (conditions): Work Place Hazards: Congestion, clutter or restricted motion  
- Process (conditions): Organisational: Inadequate work standards/procedures  
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

### Malaysia

**Function:** Production  
**Category:** Explosions or Burns  
**Activity:** Maintenance, Inspection, Testing

**Narrative:**
Explosion and fire at offshore platform during depressurization in preparation of planned shutdown. Six (6) personnel injured from the incident.

**What went wrong:**
- Failure of flange joint connections due to two phase flow vibration and poor conditions of piping support, resulting in release of hydrocarbon during depressurization of process system

**Corrective actions and recommendations:**
- Understanding and practice of Management of Change (MOC) need to be reinforced to avoid putting people life and assets at risks.  
- Maintenance schedule has to be adhered to.  
- Rigorous site specific procedures shall be reviewed and strictly adhered to.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)  
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices  
- Process (conditions): Organisational: Inadequate training/competence  
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
<table>
<thead>
<tr>
<th>Region</th>
<th>Function: Production</th>
<th>Category: Exposure Electrical</th>
<th>Activity: Maintenance, Inspection, Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Potential Events by Region</strong></td>
<td>Mechanic found a module lighting fixture lying on the cooler deck while he was checking the cooler fan motor. The light fixture had dropped from a lighting junction box above the cooler deck grating. No personnel were working or walking in the area. The broken 480V wire at the top was still live and was immediately isolated.</td>
<td></td>
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<tr>
<td><strong>What went wrong:</strong></td>
<td>The lighting fixture bushing as broken; the bushing was corroded; the fixture hanger was too rigid with no bracing support at the hanger; and the lighting fixture had no safety wire installed.</td>
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</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>Install safety wire at all lighting fixtures and clarify inspection and PM requirements for lighting fixtures.</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>Function: Production</th>
<th>Category: Struck by</th>
<th>Activity: Maintenance, Inspection, Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Malaysia</strong></td>
<td>Mechanics were working on a fire water pump when suddenly an overhead isolation valve wheel chain assembly fell down and hit the adjacent pump discharger area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>What went wrong:</strong></td>
<td>Wheel chain assembly clamps were broken; wheel chain assembly was badly corroded and had been in service for more than 10 years and exposed to adverse environment.</td>
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</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>Inspect and verify all similar wheel chain assemblies are not corroded. Develop inspection plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Causal factors:</strong></td>
<td>Process (conditions): Tools, Equipment, Materials &amp; Products: Inadequate maintenance/inspection/testing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>Function: Production</th>
<th>Category: Explosions or Burns</th>
<th>Activity: Maintenance, Inspection, Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thailand</strong></td>
<td>A worker suffered a broken nose 2nd degree burn to his face and minor burns to his arm/neck when caught in a flash fire. Work in progress was to remove spent adsorbent from process vessel on offshore platform.</td>
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</tr>
<tr>
<td><strong>What went wrong:</strong></td>
<td>Inadequate N2 purged A vacuum pump discharge hose was re-routed and inserted into the vessel to avoid nuisance dust and high LEL detection in open area. The vacuum and discharge hoses were antistatic type but not earthed to the vacuum pump or platform grounded. The suction hose had a metal hoop at its tip.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>Review methods of freeing the vessel, ensure adequate % LEL control on top by continuous monitoring. Whenever jobs are changed evaluate the implications fully. (Management of Change) Ensure stringent earthing of equipment to the platform structure where static discharge may build up.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**High Potential Events by Region**

**Europe**

**Onshore**

**Denmark**  
**Function:** Construction  
**Category:** Struck by  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
During rigging for spooling, a roller window (153 kg) fell down 5 metres when it was being adjusted into position by fork lift. There was no personal injury or damage to product. 2 operators were involved in the incident, a fork lift driver and an operator assisting the driver. The operator was standing by the staircase at a safe distance, when the incident occurred. The roller window fell to the right as a result of being over weight.

**Preliminary Key Findings:**
- When the operators inspected the roller window after the incident they discovered it was not secured, as it should have been, with safety bolts and pins.
- Visual inspection of the locking mechanism for the window was performed before adjusting the window, but operator did not see the missing safety bolts and pins.
- Prior to the incident the operator had been operating the winch to adjust the height of the roller window.
- There is an established check list for spooling, normally the check list is filled out after set up of the spooling lane and not during rigging.
- The window was already in place when the operator started to do the final adjustment of the window.
- TBT in place.
- Maintenance routines in place, all windows are registered in Dash and are controlled periodically in batches.

**What went wrong:**
Investigation points to the following key conclusions:
- Lack of task risk assessment of routine operations can cause lack of risk awareness
- Un-standardised locking system for roller windows can cause confusion and misunderstanding among the operators operating the roller windows.
- Unclear responsibilities and missing routines with regards to storage, inspection and maintenance of the roller windows.
- Lack of respect and/or understanding of the importance of safety devices like bolts and pins.

**Triggering cause:**
- Missing safety points and pins.

**Primary cause:**
- Operators failed to identify the missing safety bolts and pins. Secondary cause:
- Third party had removed the safety bolts and pins.

**Tertiary cause:**
- Lack of risk assessment of the task
- Lack of work instruction
- Weakness in inspection and monitoring system for roller windows that are prepared for production

**Causal factors:**
- People (acts): Following Procedures: Improper lifting or loading
- Process (conditions): Organisational: Inadequate work standards/procedures
High Potential Events by Region

Romania

Function: Drilling
Category: Pressure Release
Activity: Drilling, Workover, Well Services

Narrative:
A workover crew was carrying out an intervention to the gas well in order to replace the tubing string. In order to perform the pressure test of the christmas tree, the pumping line between the pump truck and christmas tree check valve had to be tested at 150 bar. When the pressure reached 120 bar, the plug of the check valve 2 1/19 *210 was ejected, hit the pressure release pipe, the superior flange of the pressure release pipe, passed over the safety shield and hit the helmet of the foreman which was at approx. 10m away.

What went wrong:
- This incident clearly demonstrates the potential of any pressure test to produce damage or injury when safety precautions are not followed up.

Corrective actions and recommendations:
As such, before pressurising any equipment, consider the following:
- The current state of the equipment to be pressure tested;
- The equipment used to perform the test: use a hand pump instead of a pump truck!
- Ensure personnel are properly protected and at a proper distance.

Causal factors:
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
- Process (conditions): Organisational: Failure to report/learn from events

Offshore

Denmark

Function: Drilling
Category: Struck by
Activity: Drilling, Workover, Well Services

Narrative:
When attempting to remove wear bushing the tugger got caught in the DDM resulting in a sudden release of energy. When the tugger came free it snapped the wear bushing out of the rotary table. No one was injured during the event.
The drill crew was removing the wear bushing for the retrieval of the wellhead wear bushing. The removal of the rotary wear bushing has one man on the tugger and one man holding hooks in the bushing. When the tugger came free from the DDM it sent the retrieving hooks and wear bushing flying above 3 meters in the air. The wear bushing then landed on the other half of the wear bushing placed on the deck and then skidded approximately 2 meters away from the rotary table.
At the time of the event there were multiple people on the drill floor. Weight of object: 149.5kg; Distance dropped: approx 3m; 4400 Joule

What went wrong:
- Procedure (PR): Requirement for instruction/procedure not identified.
- Incompatible Goal (IG): Maintenance of optimal working conditions was insufficient
- Design (DE): Consider if design philosophy inappropriate. Insufficient design provisions for the limited space. Insufficient controls in the design change process. Insufficient Design-User communication during design or modifications. Consider risk of design holding bushing (swinging vs. dropped load)
- Communication (CO): Procedures about the communication structure was inefficient and insufficient feedback on effectiveness of “One-Pagers”
- Organisation (OR): The analysis of reporting does not focus on systematic errors.

Causal factors:
- People (acts): Following Procedures: Overexertion or improper position/posture for task
### High Potential Events by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Function</th>
<th>Category: Struck by</th>
<th>Activity: Seismic/Survey Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenland</td>
<td>Exploration</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Narrative:</strong></td>
<td>During corer deployment, the hanging frame of a sheave failed and parted resulting in the line that was running through the sheave falling out and coming into contact with a worker below. The worker sustained a minor injury to his right arm that resulted in swelling and bruising.</td>
<td></td>
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</tr>
</tbody>
</table>
| **What went wrong:** | • Equipment failure under excessive load.  
• Failure to secure sheave with secondary retention.  
• Inadequate equipment selection.  
• Failure in risk management and particular hazard analysis.  
• Inadequate planning – personnel should have not been in hazard zone. |
| **Corrective actions and recommendations:** | • Discontinue use of sheave and reinstate older type sheave used successfully in previous ops.  
• Communicate hazard to other vessels.  
• Install secondary fall protection if possible.  
• Risk assessment improvements  
• Develop and record routine inspection programme for lifting equipment. |
| **Causal factors:** | People (acts): Following Procedures: Improper position (in the line of fire)  
Process (conditions): Organisational: Inadequate hazard identification or risk assessment |

<table>
<thead>
<tr>
<th>Greenland</th>
<th>Function: Drilling</th>
<th>Category: Caught In, Under or Between</th>
<th>Activity: Transport – Water, incl. Marine activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative:</strong></td>
<td>Vessel was in the process of mooring alongside the quay. The Captain reporting seeing a person who jumped onboard deck before the gangway was secure and access granted to board the vessel.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **What went wrong:** | • Company Base Supply were not involved.  
• Changing hazards due to rope entanglement.  
• Delay in deploying gangway.  
• Vessel crew busy – did not observe person boarding vessel.  
• Vessel’s side gate readily accessible from side quay. |
| **Corrective actions and recommendations:** | • Company to be involved in, and present during, mooring and departure operations.  
• Additional loadmasters required to cover work at various locations.  
• Undertake review of materials and logistics operations in Greenland and develop interface document.  
• Toolbox talks to take place before any cargo operation in port. |
| **Causal factors:** | People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress  
Process (conditions): Organisational: Inadequate supervision |
### High Potential Events by Region

<table>
<thead>
<tr>
<th>Greenland</th>
<th>Function: Drilling</th>
<th>Category: Explosions or Burns</th>
<th>Activity: Transport – Air</th>
</tr>
</thead>
</table>

**Narrative:**
A helicopter sustained a ruptured starboard sponson fuel tank whilst refuelling via a pressure feed system on the Helideck. This resulted in Jet A1 fuel draining onto the helideck (1099 litres was pumped into the port sponson). The automatic engine shutdown was initiated. Emergency action taken by the helideck crew and pilots to prevent an escalation of the incident.

**What went wrong:**
- The incident was caused by two technical failings and aggravated by the pilot failing to detect the symptoms and prevent damage.
- Software/Procedures/Equipment Deficiencies
- Work Direction/Preparation
- Lack of awareness/Communication
- Human Performance/Self Perceived Pressure

**Corrective actions and recommendations:**
- All operators use gravity refuelling whenever possible.
- When gravity refuelling is not possible or practical, follow strict guidance provided which includes minimising pressure fuelling with rotor turning, in high wind conditions, when loading/unloading passengers or equipment; monitoring fuel quantity indication in the cockpit and ceasing fuelling.
- operations immediately if fuel indication stops increasing, continuous communication between personnel in cockpit and fuelling personnel, conducting both primary and secondary high level pre-checks before every fuelling operation to verify operation, in accordance with
- Maintenance Manual SA S92A-AMM-000, etc.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
- Process (conditions): Organisational: Inadequate communication

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<table>
<thead>
<tr>
<th>Greenland</th>
<th>Function: Drilling</th>
<th>Category: Exposure Noise, Chemical, Biological, Vibration</th>
<th>Activity: Drilling, Workover, Well Services</th>
</tr>
</thead>
</table>

**Narrative:**
STOP Card raised onboard rig to highlight lack of care taken when slops samples were being taken. An analysis of the slops revealed a H$_2$S level in excess of 400ppm. H$_2$S in concentrations in the range of 320-530ppm can lead to pulmonary oedema with the possibility of death.

**What went wrong:**
- Lack of overall slops management procedure.
- Inadequate risk assessment.
- Non-compliance with procedures.
- Inadequate slop tank hardware.

**Corrective actions and recommendations:**
- Ensure the design of all slop tanks is suitable for holding slops from all the drains it could be exposed to.
- Reclassify the slop tanks accordingly.
- Produce an overall slops management procedure.
- Install agitators in all slop tanks to reduce the production and retention of H$_2$S ensuring the H$_2$S vent line is capable of carrying gases from all 3 slop tanks.
- Install a permanently piped circulation system and dosing system on all slop tanks.
- Reduce the required sample size by x 0.1 to 500ml.
- Double valve all sample ports.
- Ensure through procedure and supervision that sampling personnel are wearing BA sets.
- Install H$_2$S alarms in appropriate locations around the slop tanks.
- Review the practice of selecting risk assessments and procedures from a database and trying to match them to similar tasks; as opposed to producing bespoke risk assessments and procedures for tasks that carry significant risks.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

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### Greenland: Drilling, Category: Pressure Release

**Activity:** Drilling, Workover, Well Services

**Narrative:**
While mixing the cement slurry for the 30" Conductor cementation, an overpressurisation event occurred as a result of pumping against a closed valve. Pressure realised was 19,000 psi. This was an overpressure of 17,000 psi above and beyond what was required.

**What went wrong:**
- Failure to check, monitor and observe.
- Inadequate planning, leadership and supervision.
- Inadequate communications.
- Physical or psychological stress.
- Lack of knowledge/skill.
- Inadequate engineering manufacturing.
- Inadequate standards/procedures and work instructions.

**Corrective actions and recommendations:**
- Documented induction process and checklists, including local and UK specific national standards and legislation. Induction process must be documented for all newcomers to the geographic location.
- HSE and Service Quality Competency Matrix to define job specific minimum requirements for any newcomer to the geographic location. Competency assessment process must be documented for all newcomers to the geographic location.
- Pre-project meeting with drilling company and operating company to agree on requirements of equipment and personnel to ensure we full compliance with local operating regulations.
- PRA's to include FS assigned to project to ensure operational competencies are fully understood.
- Review current practices and tools for rig familiarization, sharing of rig specific information and handover processes. If required, introduce more advanced tools, such as 'TeamSpace' to facilitate these processes better.
- Develop UK Fatigue Management Plan (FMP). Introduce FMP to employees and clients.
- Evaluate the feasibility of an engineered solution for high pressure valve operations to avoid pumping against closed valves in the future. Evaluate the feasibility of linking downhole valve and recirculation valve (back into displacement tank) in a way that one valve will open when the other valve is closed. Evaluate the feasibility of using a camera to show position of downhole and recirculation valves inside the remote control cabin. Suggest these changes to IPC.
- Modify Well Services QHSE Standard to include re-setting of overpressure shutdowns to zero after each operation. Update pre-job check list to ensure this is being done. Inform and train all relevant staff in this new procedure.
- Modify existing Pre-Job checklist to verify the set pressure of the OPSD.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Fatigue
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
### High Potential Events by Region

<table>
<thead>
<tr>
<th>Greenland</th>
<th>Function: Drilling</th>
<th>Category: Struck by</th>
<th>Activity: Drilling, Workover, Well Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative:</strong></td>
<td>During bottom hole assembly (BHA) handling operations the near perpendicular BHA dropped from the elevators as a result of the Lifting Nubbin slipping through the 6 5/8” Elevator. The BHA dropped Aft striking a Cherry-Picker-Arm before falling approximately 7 metres further onto the auxiliary cathead control panel, striking a Speaker Post before eventually falling onto the Drillfloor. As a result of the impact to the Cherry Picker Arm a 1.7kg hydraulic-block fell from the Cherry-Picker-Arm to the Drillfloor.</td>
<td><strong>What went wrong:</strong></td>
<td>- Misunderstanding of the varying equipment colour codes. - Confusing policy/procedures/systems covering colour coding of equipment. - Lack of experience and training.</td>
</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>- Better forward planning of tasks (specifically looking for any tubular changes that require changes to elevators or elevator inserts). - Counter-checks that lifting/hoisting equipment is correctly deployed for these changes. - Ensure personnel on task have necessary experience and training. - Improve policy and procedures to remove confusion. - Establish a suitable forum and explore the possibility of garnering support for an industry-wide solution/approach to this issue.</td>
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<table>
<thead>
<tr>
<th>Greenland</th>
<th>Function: Drilling</th>
<th>Category: Struck by</th>
<th>Activity: Lifting, Crane, Rigging, Deck operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrative:</strong></td>
<td>During deployment of ice management equipment including a buoy system a member of the crew was struck by a fender buoy breaking his ankle and dragging him across the deck.</td>
<td><strong>What went wrong:</strong></td>
<td>- Marker flag buoy sinking and the assembly having to be modified with an additional buoyancy aid. - Rope supplied with assembly possibly too small a gauge. - Inexperienced member of personnel involved. - First time vessel had used the net assembly on an iceberg.</td>
</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>- Review risk assessment database and ensure all activities associated with ice management are covered. - Review tool box talk (TBT) process and initiate plan that TBTs are held prior to any hazardous activity. - Senior members to undergo risk assessment training. - Training in caught between/hazard awareness. - Full audit to be completed if not already done so.</td>
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<tbody>
<tr>
<td><strong>Narrative:</strong></td>
<td>Supply vessel collided with the Drillship while working alongside discharging cargo, resulting in visual, but minor damage to the Starboard Aft corner of the vessel.</td>
<td><strong>What went wrong:</strong></td>
<td>- Lack of knowledge, experience &amp; formal training of the vessel KPOS dynamic positioning (DP) System. - The vessel recruitment process failed to recognise that although the captain being hired was experienced, he lacked specific knowledge, training and competence in the KPOS/DP system installed on the vessel. - A lack of understanding by vessel company to invest in proper training for personnel operating highly technical equipment, such as the KPOS DP installed on the vessel; the Captain was a highly experienced mariner and DP specialist but not in the type of hardware &amp; software specific to the vessel.</td>
</tr>
<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
<td>- All personnel who control and operate DP Systems during vessel movement must be trained and competent to operate specific DP Management Systems for the vessel they are assigned to. - Further improved weather planning. - Well control awareness and planning throughout the drilling phase should highlight the hazards of vessel activity when the MODU has communication with a live well.</td>
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</tr>
<tr>
<td><strong>Causal factors:</strong></td>
<td>- Process (conditions): Organisational: Inadequate training/competence</td>
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</tbody>
</table>
### High Potential Events by Region

<table>
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<tr>
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<th>Function</th>
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<th>Activity</th>
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</table>

**Narrative:**
During the vessel crew change that was taking place in the bay by fast rescue craft (FRC), two separate observations were made of crew members onboard the FRC standing up and not wearing life-vests whilst the FRC was in motion. The vessel bridge was immediately informed on both occasions and told to make sure FRC transfers were being performed with all passengers and crew wearing life-vests and sitting down while the FRC is in motion.

**What went wrong:**
- Life vests not worn.
- Inadequate checks, supervision.

**Corrective actions and recommendations:**
- Improved safety checks, procedures, reminders re PPE.

**Causal factors:**
- People (acts): Use of Protective Methods: Personal Protective Equipment not used or used improperly
- Process (conditions): Protective Systems: Inadequate/defective Personal Protective Equipment
- Process (conditions): Organisational: Inadequate work standards/procedures

<table>
<thead>
<tr>
<th>Netherlands</th>
<th>Exploration</th>
<th>Explosions or Burns</th>
<th>Drilling, Workover, Well Services</th>
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</thead>
</table>

**Narrative:**
A 10 meter long perforating gun, still in the riser, went off while it was partially below and partially on the rig floor. Nobody was injured during this incident and material damage is relatively small.

A perforating gun is a tool used to punch holes through the well casing in order to allow gas from the reservoir to flow to the surface. A perforating gun does not contain bullets but high pressure explosives. The energy released after firing the guns leads to puncturing holes in the casing.

**What went wrong:**
The gun did not explode when it should.

**Corrective actions and recommendations:**
Thanks to safety rules nobody was near the area when the gun exploded. An incident investigation team was formed immediately to investigate this incident and find the root causes, both from a technical as well as an organizational point of view. If personnel had been in the vicinity of the explosion it could have caused multiple fatalities.

**Causal factors:**
Upon completion of works on profile in Verkhnechosk oil and gas condensate field the shooting crew of LLC TNG-Lenskoye SP-17 was in the process of handover, and the driller (born in 1960) was climbing into a multi-purpose light-armored towing vehicle, his left leg was still outside when a drilling rig mounted on caterpillar tractor TT-4 driving behind him in reverse gear hit the multi-purpose light-armored towing vehicle cabin door with a drilling rod protruding from behind to 40 cm beyond dimensions of the drilling rig on the right side. The door closed and as a result the left leg of Snegirev M.V. was squeezed between the door and the body of the multi-purpose light-armored towing vehicle. The casualty was rendered first aid in location. At 00:03 he was transported to Kirensk town central regional hospital by medical aviation. The diagnosis: open fracture of both bones of the left shank with displacement.

What went wrong:

Immediate causes:
- Violation of procedures by individual employees:
  - Drilling rig operator did not make sure that implementation of the manoeuvre was safe.
  - Operator of multi-purpose light-armored towing vehicle did not control boarding of passengers.
- Non-observance of procedures in order to speed up implementation of works:
  - Employees wanted to leave the profile as soon as possible in order to speed up shift handover process.

System causes:
- Improper planning of works:
  - Not all safety precautions were taken during boarding of passengers.
- Lack of safety plan during implementation of works:
  - Procedure and scheme for boarding and debarkation of passengers on profiles was not developed.
- Implementation of safety plan did not meet requirements due to deficiencies:
  - Safety issues were not fully reviewed during risk assessment for “Operations for transportation of loads and personnel”.
- Lack of horizontal link between employees:
  - The incident took place because there was no proper communication among the crew members.

Causal factors:
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
High Potential Events by Region

Russia

Function: Drilling
Category: Explosions or Burns
Activity: Drilling, Workover, Well Services

Narrative:
During implementation of hot jobs associated with dismantling of a pipeline (Ø=426x8mm) at a decommissioned Central Processing Facility within a central gathering facility by a crew of 4 persons, a pop of gas with following ignition took place. At 14:15 the ignition was extinguished by resources of the fire unit. As a result of the ignition burns on various parts of the body were received by an electric and gas welder of grade 5. The casualty was rendered first pre-doctor aid, after which by an ambulance the casualty was transported to resuscitation department of the city hospital. The diagnosis: thermal flame burns of the head, back, buttocks, back surface of hips of level 1-3 up to 50% of the body surface. Compensated burn shock of level 1-2.

What went wrong:
Immediate causes of the incident
• Violation of regulations on implementation of gas hazard operations.
  – The list of gas hazard operations does not contain pipeline steaming.
• Violation of regulations on implementation of hot jobs.
  – Actions on removal of oil-containing fluid from the pipeline are not developed and not implemented.
  – Hot jobs and gas hazard operations are combined.
  – Requirements of Golden Rules of safe work implementation in the company are not met. Continuous control over air medium in the hazardous zone is not provided, ingress of flammable and explosive substances into air medium is not excluded. Samples of gas and air mixture were taken in places not demonstrating actual concentration of hydracarbons in the pipeline (in the cutting working zone).
• Improper decision-making or errors in judgement.
  – The Head and shop supervisor were sure that the pipeline was prepared for implementation of hot jobs. Technical solution could not provide for the pipeline drainage. Instrumental confirmation of the pipeline preparedness for repair operations was not achieved.
  – Alternative option of replacement of the pipeline defected section (implementation of works with a pipe-cutter with following plugging of unsealed pipeline ends) was not considered.
• Incorrect sitition during work implementation.
  – Welder was in the hazardous zone of potential release standing on a ladder.
• Incorrectly prepared equipment.
  – The pipeline was not prepared for implementation of hot jobs.
• Tight or restriced space.
  – the injured man was in tight conditions, which hindered timely evacuation.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• People (acts): Following Procedures: Improper position (in the line of fire)
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
• Process (conditions): Work Place Hazards: Congestion, clutter or restricted motion
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
High Potential Events by Region

Russia
Function: Drilling
Category: Exposure Electrical
Activity: Drilling, Workover, Well Services

Narrative:
On the well pad a crew of mechanics was repairing and cleaning an auger. An electrical mechanic periodically switched on and off the auger power supply from the mud tank control panel. The switching resulted in a short circuit between phases of the breaker and an electric arc, which caused thermal burns of hands of the electrical mechanic. The casualty was rendered first aid, after which he was transported by an ambulance to hospital. The diagnosis: thermal burn of hands of level I-II. Currently he is given out-patient treatment.

What went wrong:
Immediate causes of the incident:
- Improper use of equipment, tools, materials (routine scheme of control over electric engine of mechanism for transportation of cuttings was changed).
- Personal protective equipment was not used (electrical mechanic did not use dielectric gloves). – Protection system safety devices were switched off or dismantled (electrical mechanic was switching AP50-3MT on with removed lid and arc-suppressing chamber).
- Improper decision-making or errors in judgement (electrician and mechanic made a decision to remove a malfunction by means of applying not permitted techniques and actions).

System causes of the incident:
- Intentional violation of industrial and electrical safety requirements by an employee (knowing about the violation and potential hazard the electrical mechanic violated requirements of regulations on occupational safety, industrial and electric safety during operation of electric units). Lack of appropriate attention to hazards/incidents (electrical mechanic did not perform required isolation from electric power source and did not put warning tags on control devices prior to commencement of repair operations on the mechanism for transportation of drilling cuttings).
- Leadership not meeting requirements (lack of control over implementation of repair operations on the side of the toolpusher).
- Lack of appropriate attention to hazards/incidents (electrical mechanic did not perform required isolation from electric power source and did not put warning tags on control devices prior to commencement of repair operations on the mechanism for transportation of drilling cuttings).

Causal factors:
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation
- People (acts): Use of Protective Methods: Personal Protective Equipment not used or used improperly
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

Safety performance indicators – 2010 data

Russia
Function: Drilling
Category: Exposure Electrical
Activity: Unspecified – other

Narrative:
At 12:20 disconnection of lines from an oil switch at a substation resulted in a short circuit which caused an electrical injury to an electrical mechanic. The casualty was transported by an ambulance to the central regional hospital. The preliminary diagnosis: electrical point burns of fingers on the right hand. His condition is satisfactory.

What went wrong:
Immediate causes of the incident:
- Improper use of equipment, tools, materials (routine scheme of control over electric engine of mechanism for transportation of cuttings was changed).
- Personal protective equipment was not used (electrical mechanic did not use dielectric gloves).
- Protection system safety devices were switched off or dismantled (electrical mechanic was switching AP50-3MT on with removed lid and arc-suppressing chamber).
- Improper decision-making or errors in judgement (electrician and mechanic made a decision to remove a malfunction by means of applying not permitted techniques and actions).

System causes of the incident:
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- Lack of appropriate attention to hazards/incidents (electrical mechanic did not perform required isolation from electric power source and did not put warning tags on control devices prior to commencement of repair operations on the mechanism for transportation of drilling cuttings).

Causal factors:
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation
- People (acts): Use of Protective Methods: Personal Protective Equipment not used or used improperly
**HIGH POTENTIAL EVENTS BY REGION**

- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Poor leadership/organisational culture

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<tbody>
<tr>
<td>Russia</td>
<td>Drilling</td>
<td>Other</td>
<td>Seismic/Survey Operations</td>
</tr>
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</table>

**Narrative:**
A contractor crew was performing drilling operations on a profile using a small-size auger-type drilling rig. At 10:30 the rotating shaft of the power transfer caught and reeled a sleeve of safety clothes of drilling rig grade 5 operator (born in 1967). As a result of the incident the crew member suffered an injury to his left arm. The casualty was rendered first aid on location and transported to hospital. The diagnosis: open fracture of both bones of the left forearm in the middle third.

**What went wrong:**

**Immediate causes:**
- Technical maintenance/repair of the equipment during its operation.
- The operator tried to remove a malfunction without shutdown of drilling rig driver.
- Mechanical hazards.
- The cause of the incident is rotating shaft of drilling rig power transfer.
- Incorrect decision-making or erroneous judgement.
- Operator of the drilling rig incorrectly perceived the situation and decided that he can remove a malfunction without shutdown of the drilling rig.

**System causes:**
- Lack of appropriate attention to hazards.
- While risk assessment during implementation of drilling operations was conducted and hazards were identified, the drilling rig operator decided that power transfer shaft is not a hazard which can cause an injury.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

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<tbody>
<tr>
<td>Russia</td>
<td>Drilling</td>
<td>Struck by</td>
<td>Construction, Commissioning, Decommissioning</td>
</tr>
</tbody>
</table>

**Narrative:**
A crew of the contractor company was performing loading and unloading operations at the field well pad using a crane mounted on a truck. At 09:35 the revolving portion of the crane injured a rigger. At 14:00 the casualty was transported to the clinical hospital by sanitary aviation aircraft. The diagnosis: comminuted fractures of upper and lower jaws. Brain concussion. Traumatic shock. Stable grave condition.

**What went wrong:**

**Immediate causes:**
- Violation of regulations on implementation of lifting operations.
  - The rigger in the zone of counterweights behind the crane operator cabin was in the “dead zone” of the crane operator visibility, and also a soft sling was in the place having unsafe space for implementation of works by the employee at the moment of movement of the crane revolving part.
- Improper decision-making or erroneous judgement.
  - The rigger mistakenly decided that the crane operator would not make movement with the revolving part in his direction and he would have enough time to take out the textile sling from the spare wheel disk.
- Mechanically, routinely performed work without appropriate attention.
  - The rigger having prolonged continuous work experience did not pay proper attention to existing hazards and relied on available working experience.

**System causes:**
- Planning deficiencies
  - Prior to commencement of loading and unloading operations the person responsible for safe implementation of works did not appropriately and correctly plan actions of all participants of work implementation at all stages, he did not prepare inventory required for work implementation.
- Inadequate identification of workplace hazards and/or risk levels.
  - The rigger did not correctly assess the hazard, he did not take into account that high level of injury probability is created during rotation of the crane revolving part.
- Lack of horizontal link, lack of coordination among crews, shifts, employees.
  - There is no horizontal link in the crew between members of the crew of riggers and the crane operator.
- Lack of vertical link, lack of coordination inside the organization.
  - There is no sufficient vertical link and coordination in the crew between the person responsible for implementation of works and subordinate employees.
- The method of confirmation that the information was accepted and the task implemented is not applied.
  - The method of confirmation that the information on received task is understood is not applied.

**Causal factors:**
- People (acts): Following Procedures: Overexertion or improper position/posture for task
- People (acts): Following Procedures: Improper lifting or loading
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
**High Potential Events by Region**

<table>
<thead>
<tr>
<th>Russia</th>
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<th>Category: Struck by</th>
<th>Activity: Drilling, Workover, Well Services</th>
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<tbody>
<tr>
<td><strong>Narrative:</strong></td>
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<tr>
<td>At 20:30 an assistant driller from an external drilling contractor (born in 1982) during implementation of operations associated with cleaning of dirt on a dismantled panel of drilling rig shelter panel received injuries as a result of the panel falling from an unstable position. The diagnosis: fracture of 6, 7, 8 ribs on the right along middle underarm line. Bruises of soft tissues of the right shoulder joint. Rupture of spleen capsule. He was hospitalized in Irkutsk clinical hospital on 25.07.2010. Currently the casualty is in resuscitation department. His condition is stable.</td>
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**What went wrong:**

- Improper decision-making or erroneous judgement: the casualty and the fork-lift operator decided to facilitate and speed up the process of cleaning panels of dirt, but did not assess potential risks, made an incorrect decision when they installed a shelter panel in potentially hazardous position.

**System causes:**

- Inadequate identification of workplace hazards and/or their risk level (6-4): presented chart of Process Safety Analysis for implementation of works “Washing of dismantled windshield panels” was developed formally (opinion of the commission). Nobody sighed the chart, recommendation “Do not install panel on its end” was included in the line related to the stage of works “Prepare washing gun for operation”.
- Lack, insufficiency of motivation to work safely the casualty was sure that speed of work implementation was of higher importance than safety considerations.
- Lack of policies/regulations/procedures/instructions (5-1): the drilling rig has no occupational safety instruction on type of activities “Cleaning of dismantled windshield panels of contamination”.

**Causal factors:**

- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

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<td><strong>Narrative:</strong></td>
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<tr>
<td>A Contractor Company crew was performing workover of the well pad. At 16:30 when pulling out of the hole with NV-32 pump, making up of an adjusting semi-rod on the polished rod resulted in spontaneous movement of fully unloaded rod string downwards. This resulted in squeezing of the right hand of a senior operator between the sucker-rod tongs and the guide nipple. The casualty was rendered first pre-doctor aid, an ambulance was called in, the casualty was transported to the city hospital. The diagnosis: open fracture and displacement of the base of the main phalanx on the right hand finger 1, subcapital fracture of the main phalanx on the right hand finger 1, open fracture of nail phalanx on the right hand finger 1, avulsive wounds on the back surface of the right hand.</td>
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**What went wrong:**

- Improper decision-making or erroneous judgement: the casualty and the fork-lift operator decided to facilitate and speed up the process of cleaning panels of dirt, but did not assess potential risks, made an incorrect decision when they installed a shelter panel in potentially hazardous position.

**System causes:**

- Leadership does not meet requirements.
- Lack of control over implementation of works on the side of responsible persons (senior well servicing toolpusher responsible for implementation of works on a day off, in compliance with duty schedule), which was demonstrated by improper organization of preparation works for pulling out sucker-rods.
- Lack of appropriate attention to hazards.
- During implementation of final preparation works risk assessment did not include potential falling of rod string.
- Lack of safety briefings.
- Violation of requirements of well servicing toolpusher job description, Item 4 – the toolpusher shall “assure timely implementation of all types of training and safety briefings for crew workers, and also testing of their knowledge of occupational safety regulations and instructions”.

**Causal factors:**

- People (acts): Following Procedures: Overexertion or improper position/posture for task
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Poor leadership/organisational culture
## High Potential Events by Region

### Russia

**Function:** Drilling  
**Category:** Struck by  
**Activity:** Seismic/Survey Operations

**Narrative:**
During implementation of works associated with cross-cutting of fallen wood a cross-cutter of a seismic exploration (born in 1971) was injured by a falling tree. The casualty was transported to an injury care center in Turtas settlement. The preliminary diagnosis: open fracture of shin-bone in the bottom third of the right shank.

**What went wrong:**
- **Immediate causes:**
  - Violation of regulations for wood-cutting operations;
  - The feller made the tree fall in the direction of the forest, but not in the profile opening;
  - Lack of attention to sustainability and environment;
  - Neither feller nor cross-cutter checked complete landing of the cut tree and its free (not squeezed between other trees in hazardous state) position on the land.
- **System causes:**
  - Leadership not meeting requirements;
  - Insufficient knowledge of safe work conditions at workplaces indicates weak leadership of the seismic exploration unit management in HSE area, which is demonstrated by insufficient skills to conduct risk assessment at workplaces and timely inform employees, and also insufficient training of crew members in skills to conduct risk assessment;
  - Inadequate identification of workplace hazards and/or their risk levels;
  - Model process chart of wood-cutting operations does not contain a requirement for detailed risk assessment prior to commencement of topogeodesic works. Workplace risk assessment is not conducted/ or conducted insufficiently, feller/cross-cutter could not adequately assess originated risk in the process of work implementation.
- **Control/audits/inspections not meeting requirements:**
  - Insufficient control over proper implementation of work on the side of engineering staff (incompliance with wood-felling technology, incomplete composition of the crew).

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision

### Russia

**Function:** Drilling  
**Category:** Struck by  
**Activity:** Seismic/Survey Operations

**Narrative:**
During implementation of wood-cutting operations by a contractor company a cut tree fell on the cabin of a multi-purpose light-armored towing vehicle as a result of which an operator received an injury of the left forearm and the head. The casualty was rendered first aid, after which he was transported to an injury care station in Turtas settlement. The diagnosis: closed fracture of the left forearm, craniocerebral injury.

**What went wrong:**
- **Critical factors:**
  - The all-terrain vehicle driver entered the hazardous area
- **Immediate causes:**
  - Violation of procedures by a group/employee
  - Violation of procedures by the leader
- **System causes:**
  - Incorrect motivation settings
  - Lack of due attention to hazards
  - Inadequate operational control
  - In the course of exploration line preparation the tree felling operations process chart was developed but not followed.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision
### Kuwait

**Function:** Drilling  
**Category:** Pressure Release  
**Activity:** Drilling, Workover, Well Services

**Narrative:**
On 7th April 2010, in a Drilling rig, at around 03:45hrs, the rig crew was testing the BOP Blind Shear ram. After testing to 15,000 PSI, the night pusher bled the pressure back to the testing unit to zero and asked the floor man to close the manual valve next to the check valve. The IP was asked to disconnect the quick latch coupling of the test hose from the hammer union hook up to the lower kill line. While doing so, he slipped and the hose detached from the quick latch connection. As a result the fluid came out through the broken quick latch fitting of the hammer union like a jet and hit the right hand arm above the elbow. It appears that the pressure was not bled fully and there was trapped pressure behind the fitting. First Aid was administered to the IP, and he was taken to the hospital for further treatment.

**What went wrong:**
- Personal factors: Misperception of Risk (Risk of possible trapped pressure could not be identified); Improper motivation/inattention; Inadequate Standards setting; Lack of training
- Job Factors: Inadequate supervision/planning; Unclear or inadequate work procedures/instructions (No written procedure for BOP testing is in place)

**Corrective actions and recommendations:**
- Contractor needs to establish a procedure for BOP pressure testing and for all other similar routine and non-routine critical activities. Attach a schematic in addition to the procedure.
- JSA should be prepared in line with the established procedure and discussed with all the crew.
- Always ensure minimum personnel in the area during test and bleeding operations as this is a high potential routine job.
- During high potential routine jobs, operations should be carried out in such a manner ensuring only one job is performed at a time. There should not be any simultaneous operation.
- Bleed off the HP fluid should be always through the choke manifold.
- There should be a secondary bleed off point in addition to the test panel/unit bleed off point. Additional gauges could be added, if approved by the manufacturer, but could become plugged and hence become unreliable.
- In-charge operation must ensure for no pressure in the BOP system and explain the crew about the safe and firm placement before detaching the fittings.
- It is highly essential to increase the HSE inspections by the Company management with focus on unsafe practices/actions. HSE Supervision is mandatory during critical operations especially while working in the night.

**Causal factors:**
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication

### Qatar

**Function:** Production  
**Category:** Exposure Noise, Chemical, Biological, Vibration  
**Activity:** Maintenance, Inspection, Testing

**Narrative:**
A scaffolder was erecting scaffold near an open flange of a line that was under nitrogen purge. The purge gas had displaced the oxygen in the immediate vicinity of the flange causing the scaffolder to become dizzy.

**What went wrong:**
- Inadequate leadership/supervision – safety officers witnessed the improper sign-off of the gas test for the space around the open flange, but failed to intervene.
- Lack of knowledge – people were not aware of the hazards of nitrogen.
- Inadequate work standards – failure to conduct a gas test, inadequate job safety analysis.
- Inadequate communications – no warning barriers or signs.
- Improper motivation.

**Corrective actions and recommendations:**
- Improved training and hazard awareness of the dangers of nitrogen.

**Causal factors:**
- People (acts): Following Procedures: Violation intentional (by individual or group)
- People (acts): Use of Protective Methods: Failure to warn of hazard
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Work Place Hazards: Hazardous atmosphere [explosive/toxic/asphyxiant]
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
## High Potential Events by Region

<table>
<thead>
<tr>
<th>Country</th>
<th>Function: Production</th>
<th>Category: Pressure Release</th>
<th>Activity: Maintenance, Inspection, Testing</th>
</tr>
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<tbody>
<tr>
<td><strong>Qatar</strong></td>
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**Narrative:**
During a major shutdown, contractors opened the manway door of a reaction vessel. The contractors had been advised that the pressure inside the reactor had been reduced to a safe level. The door, which opened outwards, proved difficult to open. After struggling for a few minutes the door suddenly opened releasing a significant quantity of purge gas. The force of the escaping gas was sufficient to propel one man over the handrail of the access platform he was standing on. Fortunately he managed to grab the handrail which saved him from a fall of about 5 metres. The escaping gas blew off his safety helmet, emptied the contents of his coverall pockets and blew off his safety boots.

**What went wrong:**
- Lack of knowledge – when the door was “cracked” open the supervisor could feel a slight draught from the escaping purge gas.
- He was assured that this was to be expected since the vessel had a slight positive pressure to maintain the purge. The operator observed the reactor pressure was 0.2 barg and thought this low enough to allow the manway door to be opened.
- Inadequate work standards – the Job Safety Analysis required zero residual pressure in the vessel before opening it. This requirement was not complied with. The tool box talk did not cover all aspects and hazards of this particular job but relied on the workers’ experience of the system. A job Risk Assessment should have been conducted when the door could not be opened.

**Corrective actions and recommendations:**
- Training on the dangers of trapped pressure to be provided to relevant personnel.
- Safe working practices to be reviewed to ensure that trapped pressure is adequately addressed.
- Convey lessons learned from this incident to relevant parties.

**Causal factors:**
- People (acts): Following Procedures: Violation intentional (by individual or group)
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision

<table>
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<tr>
<th>Country</th>
<th>Function: Production</th>
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<th>Activity: Production Operations</th>
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<tr>
<td><strong>Qatar</strong></td>
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**Narrative:**
Due to the sudden closure of an 82 inch butterfly valve, the pressure upstream of the valve increased from 5 barg to 8.5 barg. The system incorporates a “spill back” line to protect the system from overpressure. When the spill back line was opened it subjected a 24 inch Fibre Reinforced Thermosetting Plastic (FRP) elbow to a pressure such that the bond between the FRP elbow and the carbon steel line failed. The elbow was ejected some distance.

**What went wrong:**
- Inadequate QA/QC on workmanship – the FRP piping component was bonded together using standard adhesive. Improper application of the adhesive or poor quality control/quality check can cause such a failure prior to its design life. The root cause analysis team could not verify this hypothesis, however accorded high confidence level to it since all other possible causes of failure were eliminated.

**Corrective actions and recommendations:**
- The incident highlighted how critical the QA/QC of this type of joint is. Similar work should be carried out by a specialist vendor.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- Process (conditions): Organisational: Inadequate work standards/procedures

<table>
<thead>
<tr>
<th>Country</th>
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<th>Category: Struck by</th>
<th>Activity: Maintenance, Inspection, Testing</th>
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<tbody>
<tr>
<td><strong>Qatar</strong></td>
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**Narrative:**
A hydraulic jack, weighing 7 kgs, was being used to align a 46 inch flange. The jack was resting on cribbing. As the jack was being extended it slipped from its position and dropped approximately 24 metres coming to rest on a structure about 4 metres above ground level. The area below the work site was not barricaded.

**What went wrong:**
- Work direction – the method statement and job safety analysis did not include the use of a jack.
- Human machine interface – the tools and cribbing were not suitable for the task.
- Work direction – the work package failed to address how the flange would be aligned.
- Preparation – the area below the work site (drop zone) was not barricaded.

**Corrective actions and recommendations:**
- Correct tool for flange alignment identified.
- Requirements for cribbing/packing identified.

**Causal factors:**
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- People (acts): Use of Protective Methods: Failure to warn of hazard
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate supervision
High Potential Events by Region

UAE

Function: Production
Category: Explosions or Burns
Activity: Production Operations

Narrative:
Disintegration of a Nitrogen Receiver vessel due to a Brittle Fracture.

What went wrong:
The vessel was allowed to come into contact with liquid nitrogen. An unrecorded Plant Change (modification to the functionality of a Control Valve by an instrument air bypass) meant that the control valve designed to shut off liquid nitrogen could not close. Additionally, since process boilers were shut down, no steam was being generated to vapourise the liquid nitrogen. Thus liquid nitrogen could pass into equipment not designed to withstand very low temperatures. The root causes were identified as: deficiencies in design of the nitrogen control valve, unapproved changes, limitation in the Shutdown Plan, alarm overload, organisation of manpower.

Corrective actions and recommendations:
• All modifications, no matter how minor, must be captured in the Management of Change Process and the Plant Change Process to be modified to capture changes to operational design including the need to consult vendors
• Alarm Management review to be completed
• Shutdown planning failed to recognise the need for steam after the boilers had been shut down
• Staff to be trained and competence demonstrated for the operation of vendor units and risk management of cryogenic liquids
• Review shut down organisation, patrolling requirements and handovers.
• Excursions outside the Operating Envelope to be reported and investigated

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
• Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
• Process (conditions): Organisational: Inadequate supervision
• Process (conditions): Organisational: Failure to report/learn from events

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UAE

Function: Production
Category: Explosions or Burns
Activity: Production Operations

Narrative:
Overpressure of a regeneration fuel gas fired furnace resulting in 1 LWC and damage to the furnace.

What went wrong:
During normal operations, a furnace was found to have suffered flame failure. During the relighting process, overpressure was experienced in the furnace chamber. It was discovered that the fuel gas valves had not been closed after the failure and prior to reigniting, which allowed a build-up of unburnt gas in the furnace, and there was also a miscommunication between the control room and the operator.

Corrective actions and recommendations:
• The furnace did not have flame out detection and relied on Operator training and competence. The training and competence assurance system for Operators is inadequate and requires review.
• Procedures did not clearly state that the gas cock valves must be closed prior to a relight, and the procedures should include the situations for multiple burner failure.
• The furnace had been suffering flame stability problems which had not been resolved at the time of the incident.
• The requirement for automatic flame detection should be reviewed.
• The correct use of PPE should be re-inforced as the Operator did not have his overall sleeves buttoned and was not wearing a face visor.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• People (acts): Use of Protective Methods: Personal Protective Equipment not used or used improperly
• People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
• Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
• Process (conditions): Organisational: Inadequate communication
• Process (conditions): Organisational: Inadequate supervision
• Process (conditions): Organisational: Failure to report/learn from events
High Potential Events by Region

UAE  Function: Production  Category: Other  Activity: Construction, Commissioning, Decommissioning

**Narrative:**

Bb-230 is an oil producer which was handed over to Operations after work over, waiting for installation of surface facilities and flow line tie-in to RDS-3. After hand-over, Bb-230 was equipped with a new X-Mass Tree which did not have any identification/mark-up signs. Bb-154 (Water injector) was killed and secured for work over and the work over was completed and well handed over to Operations. It is approximately 6 km away from Bb-230 and contractor surveyors jointly prepared a well head survey sketch and wrongly identified Bb-230 (Oil Producer) as Bb-154 (Water Injector). The survey was endorsed by Operations. The contractor started the job on the wrong site location using approved PTW. He completed the whole job of excavation, installation of concrete supports, welding & fabrication of the surface loop and finally was ready to loop tie-in to well head and flow line. Construction activities continued for 18 days without recognizing that the work execution was in the wrong location. Later, the contractor requested another PTW for starting tie-in activities and operations foreman went to the site (Bb-230) and realized that the contractor is working on a wrongly identified well.

**What went wrong:**

- Inadequate implementation of PSP.
- Inadequate work Planning.
- Inadequate audit/monitoring/inspect.
- Inadequate leadership.
- Inadequate design, standard, or criteria.

**Corrective actions and recommendations:**

- Update well handover certificate to include requirements for fixing metallic tags with well identification on charismas trees.
- Assign competent and experienced staff as Issuing Authority under PTW system.

**Causal factors:**

- People (acts): Following Procedures: Violation unintentional (by individual or group)

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UAE  Function: Production  Category: Pressure Release  Activity: Construction, Commissioning, Decommissioning

**Narrative:**

While a contractor was carrying out mechanical excavation, 5 fiber optic communication cables were cut. Due to the cut, all communication between the Central Degassing Station (CDS) and five Remote Degassing Stations (RDS) was lost and all RDSs were shutdown resulting in loss of production volume approximately 30,000 bbls. Two production trains were also shut down at CDS. Due to the shut down at RDS No. 5, high pressure developed in a flowline from Bb-300 causing flowline rupture, resulting in estimated spillage of 37 bbls of crude oil into the ground and release of gases into the air. Bb-304 flowline also developed a pinhole leak. The Remote Degassing Stations started back and wells no. Bb-300 & 304 were closed and flowlines were isolated for repair.

**What went wrong:**

- Management/Supervision/Employee Leadership
- Engineering/Design
- Communication
- Work Planning

**Corrective actions and recommendations:**

- Always comply with procedural protocol between partner companies and contractors in handing over of locations.
- Survey and update maps of buried/underground cables
- Develop a mechanism to assess completeness and accuracy of information provided to interface partners and contractors.

**Causal factors:**

- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Use of Protective Methods: Equipment or materials not secured
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
**UAE**  
**Function:** Drilling  
**Category:** Pressure Release  
**Activity:** Drilling, Workover, Well Services

**Narrative:**  
During a planned workover, a Well Control Incident occurred. The well became unbalanced with reservoir pressure during the initial stages of the workover. The completion string was sheared in order to secure the well and control the gas flow from the borehole. The containment of the well was lost after experiencing unexpected gas and pressure at the surface during initial operations and the subsequent kill operations, which were compromised due to multiple equipment failures. The well was continuously lubricated to maintain pressure and bleed off gases.  
No personnel injuries or damage to assets had resulted. The incident resulted in delayed operations for 18 days. There was release of gas (well control flaring).

**What went wrong:**  
- Inadequate work planning  
- Inadequate policies and procedures  
- Inadequate identification of risks  
- Inadequate assessment of required skills/competency  
- Inadequate leadership  
- Inadequate management of change

**Corrective actions and recommendations:**  
- Ensure that the well is killed prior to moving over.  
- BOP and choke manifold must be set-up for the HARD SHUT IN.  
- Wells with pressure imbalance in tubing and annulus must be pressure equalized.  
- Relatively less experienced DS must be supported by senior drilling team members.

**Causal factors:**  
- People (acts): Following Procedures: Violation unintentional (by individual or group)

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**UAE**  
**Function:** Drilling  
**Category:** Pressure Release  
**Activity:** Drilling, Workover, Well Services

**Narrative:**  
While pressure testing the choke manifold (at 3000 psi), one welded hammer union connection failed resulting in the hammer union (weighting approximately 3 Kg) being “shot” into the air (60 feet) at high velocity. The hammer union landed back in the choke manifold area.

**What went wrong:**  
- Management/Supervision/Employee Leadership

**Corrective actions and recommendations:**  
- Prepare a detailed pressure testing program for non routine operations  
- Apply management of change process to all Rig equipment/process modifications

**Causal factors:**  
- People (acts): Use of Protective Methods: Failure to warn of hazard  
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices  

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**UAE**  
**Function:** Drilling  
**Category:** Struck by  
**Activity:** Drilling, Workover, Well Services

**Narrative:**  
While drilling and making up stands offline, the gear of pipe handler motor, weighing 15 kg, broke and fell down from a height of 104 feet. The acting derrickman, who was working on the monkey board, noticed the gear as it was falling and collided with monkey board. He shouted to alert the crew working down on the rig floor. The crew moved away to a safer area and the motor gear fell down on the setback area and rolled towards driller’s cabin. No injury to personnel or any other damage was reported.

**What went wrong:**  
- Inadequate assessment of needs & risks  
- Inadequate audit/inspection/monitoring  
- Incorrect adjustment/repair & maintenance

**Corrective actions and recommendations:**  
- Install collector box underneath the movable gears.  
- Add Pipe handler motor, gear and its accessories to the “Drops” checklist.

**Causal factors:**  
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers  
### High Potential Events by Region

#### UAE

**Function:** Unspecified  
**Category:** Caught In, Under or Between  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
Three newly rented front loaders were given a task to repair the road. All drivers were instructed on the road conditions & safety precautions. Loaders were accompanied to the site by the site foreman. While repairing the road the loader’s right wheel struck a stone on the road and toppled over. There were no injuries to the loader operator and only small scratches occured to the loader’s cabin.

**What went wrong:**
- The driver’s lack of skills in driving a vehicle in off-road conditions resulted in the incorrect assessment of the situation.

**Corrective actions and recommendations:**
- The contractor to organize presentations of the incident to operators & drivers.
- Driver and operator training to be rolled out to all contractors.

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Work Place Hazards: Inadequate surfaces, floors, walkways or roads
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture

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**Narrative:**
While transporting 2 pipes a contractor trailer was being towed by a bulldozer with a steel rope. At a distance of 100 m from the bottom of the hill, the tow rope of the tandem-axle semitrailer suddenly broke away because of a sudden jerk of the trailer by the bulldozer. Thus two pipes and the semitrailer rolled back down to the bottom of the hill. There was damage to the pipes and the semitrailer body only. The SWL of the rope was 18t, the total weight of the pipes 15t. The total weight of the tandem-axle semitrailer body was 1.5t. But the rope’s clips did not withstand the weight of the load and the rope slipped out of the clips. The clips were not tightened properly before the work. That was not checked by either the driver or mechanics before the trip.

**What went wrong:**
- Failure of the tow rope anchors.

**Corrective actions and recommendations:**
- All drivers and HE operators to be informed on the Driving Policy.
- Vehicle drivers and operators to do the pre-use check of the vehicle or HE.
- Spread mangers and mechanics to organize a task risk assessment on transportation activates on a weekly basis.
- Mechanics to provide pre-job instructions to the vehicle drivers and HE operators on the work conditions at sites.

**Causal factors:**
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
**High Potential Events by Region**

**UAE**  
**Function:** Unspecified  
**Category:** Exposure Noise, Chemical, Biological, Vibration  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
On 28 Oct, a CWP was issued by Network Operations allowing nitrogen purging from TFP BVS6 to TFP BVS7. ICC #5001 was issued isolating BVS7 HOV706. The isolation was necessary to separate the nitrogen purging activity from the on-going line air drying activity from TFP-BVS7 to TFP-BVS8. This information was made known through site check prior to the CWP issuance. On 29 Oct, the contractor started the 35 kms nitrogen purging activity venting at BVS7 HOV705 (2” vent). The contractor Commissioning Manager realizing that the purging will take a minimum of 3 days and with the nitrogen being used depleting (40,000 M3) coupled with it a probable air mixing scenario sought clearance from the PMT Commissioning Manager to open BVS7 HOV711 (2” vent) and the BVS7 12” vent. The latter agreed to the request. BVS HOV711 and the BVS7 12” vent was part of the air drying line that was isolated. On 1600H of 30 Oct, Network Operations, through a conversion inquiry with contractor Commissioning Manager, found out that the Isolation (Lock-Out) of BVS7 HOV706 was removed without their knowledge.

**What went wrong:**
Network Operations, through a conversion inquiry with contractor Commissioning Manager, found out that the Isolation (Lock-Out) of BVS7 HOV706 was removed without their knowledge.

**Corrective actions and recommendations:**
- Proper schedule to be produced, agreed and adhered to.
- Cross-reference all activities to ensure SIMOP do not pose a risk.
- Ensure the attendance of key members.
- Site decisions to be communicated to all parties involved in the activity.
- Ensure all purging and venting calculations to be produced, reviewed and approved.
- LOTO training to be produced and implemented.
- PMT in conjunction with UOP to produce the responsibility matrix for the remainder of activities for CD3-CD4.

**Causal factors:**
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture

**UAE**  
**Function:** Unspecified  
**Category:** Struck by  
**Activity:** Transport – Land

**Narrative:**
At the exit from the ROW to the asphalt road the trailer was moving along existing 500 mm gas pipeline and 1400 mm water pipeline. As the supervisor was engaged in welding activities (pipeline tie-in), he could not convoy the trailer during performance of a right turn and the driver failed to choose a correct radius and the trailer’s right side wheel fell to below the road level. Under the impact of its own weight (estimated 33 tones) the backhoe slid off the trailer and fell onto the ground. The 4 chains used to secure the backhoe from 4 sides on the trailer were torn. The trailer itself did not turn over.

**What went wrong:**
- The driver’s lack of skills in driving a vehicle in the off-road conditions resulted in incorrect assessment of the situation.

**Corrective actions and recommendations:**
- To conduct off-road driving awareness sessions for the drivers of large vehicles.
- To assess drivers qualifications before they are allowed to start work.
- To conduct TBT with drivers and discuss hazards associated with driving: on the gas p/l narrow roads, turns, overhead power lines, open trench sections, in fog, during sand storms etc) before each trip.

**Causal factors:**
- Process (conditions): Work Place Hazards: Inadequate surfaces, floors, walkways or roads
- Process (conditions): Organisational: Inadequate training/competence
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture
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<tr>
<th>Country</th>
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<th>Category</th>
<th>Activity</th>
<th>Narrative</th>
<th>What went wrong</th>
<th>Causal factors</th>
</tr>
</thead>
</table>
| Yemen   | Production | Pressure Release | Production Operations | 5 gas detectors activated at jetty due to inadvertent release of trapped LNG inventory between MOV and HV for loading arms B & D, vapourised to atmosphere. Approximately 1m³ of LNG released. | Gas release to atmosphere. | People (acts): Following Procedures: Violation intentional (by individual or group)  
Process (conditions): Work Place Hazards: Hazardous atmosphere (explosive/toxic/asphyxiating) |
| Yemen   | Production | Pressure Release | Production Operations | A minor LNG leak reported at the battery limit of Train 2 from the 40” RDL valve’s upstream and downstream flanges. Less than 0.1 kg/sec release rate for less than 2 minutes. | Gas release to atmosphere. | Process (conditions): Work Place Hazards: Hazardous atmosphere (explosive/toxic/asphyxiating) |
| Yemen   | Construction | Exposure Electrical | Construction, Commissioning, Decommissioning | An excavator started work to remove electrical cables which were still live (400V). | Inadequate checking of site, inadequate isolations. | People (acts): Following Procedures: Violation intentional (by individual or group)  
People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation  
Process (conditions): Organisational: Inadequate training/competence  
Process (conditions): Organisational: Inadequate work standards/procedures  
Process (conditions): Organisational: Inadequate hazard identification or risk assessment |
| Yemen   | Construction | Struck by | Transport – Land | A 10 tonne crane counterweight fell from the trailer onto the road. No injuries but minor damage to the road. | Badly secured load | People (acts): Following Procedures: Violation intentional (by individual or group)  
People (acts): Following Procedures: Improper lifting or loading  
Process (conditions): Organisational: Inadequate work standards/procedures  
Process (conditions): Organisational: Failure to report/learn from events |
| Yemen   | Construction | Struck by | Transport – Land | A car travelling along the main road from Marib to Safr attempted to overtake another car when it lost control and veered off the road to the left side. It swerved back to the right and rolled over onto sandy ground. | Vehicle rollover. | People (acts): Following Procedures: Work or motion at improper speed |
## Yemen

<table>
<thead>
<tr>
<th>Function: Construction</th>
<th>Category: Struck by</th>
<th>Activity: Transport – Land</th>
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<tbody>
<tr>
<td><strong>Narrative:</strong></td>
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<tr>
<td>A contractor’s truck was parked on a slope. When the driver released first gear to start the vehicle, the truck started to run down the slope and it rolled over a tent in which 2 military personnel (third parties) were sleeping. One soldier received minor leg injuries.</td>
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<tr>
<td><strong>Causal factors:</strong></td>
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<tr>
<td><strong>Narrative:</strong></td>
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<tr>
<td>A small skiff rammed a patrol boat. The skiff slowly sank and the two intruders were rescued and sent to the Navy Camp.</td>
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<tr>
<td><strong>What went wrong:</strong></td>
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<tr>
<td>Aggressive act by third parties.</td>
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<tr>
<td><strong>Causal factors:</strong></td>
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<tr>
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<tr>
<td><strong>Narrative:</strong></td>
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<tr>
<td>A military pick-up and a contractor pick up were circulating in opposite directions on the pipeline right-of-way when they collided head on at KP13.</td>
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<tr>
<td><strong>What went wrong:</strong></td>
<td></td>
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</tr>
<tr>
<td>Vehicle collision.</td>
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<tr>
<td><strong>Causal factors:</strong></td>
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<tr>
<td>People (acts): Following Procedures: Violation intentional (by individual or group)</td>
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<tr>
<td>People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress</td>
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</tbody>
</table>

## Offshore

<table>
<thead>
<tr>
<th>Function: Production</th>
<th>Category: Struck by</th>
<th>Activity: Lifting, Crane, Rigging, Deck operations</th>
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</thead>
<tbody>
<tr>
<td><strong>Narrative:</strong></td>
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<tr>
<td>The platform crane was being lowered when the auxiliary hook struck the jib head block causing the auxiliary hook line to break. The block fell 20 metres to the deck. The crane was being operated with a known fault in a safety device – the block to block limit switch. An independent survey of lifting equipment conducted two weeks prior to the incident noted the fault but did not consider it warranted taking the crane out of service.</td>
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<tr>
<td><strong>What went wrong:</strong></td>
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<tr>
<td>Inadequate leadership/supervision – the platform management allowed the continued use of the crane despite knowing that the safety device was faulty.</td>
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<tr>
<td>Inadequate leadership/supervision – company crane operators were aware that the crane was not “level luffing” and a standing instruction had been issued prohibiting crane operators other than company employees to operate the crane. This instruction had not been followed.</td>
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<tr>
<td>Inadequate communications – the report from the independent surveyor should have been discussed with platform management being the surveyor left the platform.</td>
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<tr>
<td><strong>Corrective actions and recommendations:</strong></td>
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<tr>
<td>Do not operate equipment with faulty safety devices.</td>
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<tr>
<td>Ensure operators are familiar with the equipment they operate.</td>
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<tr>
<td>Communications – the wording of the final report of the lifting equipment survey, which was issued post incident, was changed from “crane not colour coded” to “crane not certified”. This significant change was not communicated to the platform management until after the incident.</td>
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<tr>
<td><strong>Causal factors:</strong></td>
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<td>People (acts): Following Procedures: Violation intentional (by individual or group)</td>
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<tr>
<td>People (acts): Use of Protective Methods: Failure to warn of hazard</td>
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<tr>
<td>People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment</td>
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<tr>
<td>Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices</td>
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<tr>
<td>Process (conditions): Organisational: Inadequate hazard identification or risk assessment</td>
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<tr>
<td>Process (conditions): Organisational: Inadequate communication</td>
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<tr>
<td>Process (conditions): Organisational: Inadequate supervision</td>
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</table>
High Potential Events by Region

Qatar
Function: Construction
Category: Falls from Height
Activity: Construction, Commissioning, Decommissioning

Narrative:
Contractor workers were involved in cathodic protection work on a steel re-bar cage structure at the Quay wall. About 50 workers were working at this area. Some workers were on top of the cage structure, some were standing on planks supported on the cage wall at an intermediate height, while some were at the base of the cage on the Quay wall. At the same time a few steel-fixers were at the same location carrying out adjustment work to the steel cage and removing temporary supports. Unexpectedly, the re-bar cage slid and collapsed on the workers causing injury to 18 workers. A crane was used to lift some of the collapsed cage structure off the workers. A nearby Medical emergency team was called. An ambulance arrived and the injured personnel were moved to Hospital for further treatment.

What went wrong:
• There was lack of proper co-ordination of the multiple activities such as steelworking, Cathodic protection (CP) and scaffolding going on at the same time on the cage at the time of the incident.
• Some material was removed from the cage which weakened the cage structure.
• The excessive load on the cage as a result of the number of people working on it as well as the distribution of the load contributed to the collapse of the cage structure.
• Adequate shuttering for the rebar cage was not provided.
• Though the steel working crew claimed to have completed their part of the job on the cage and handed over to the Cathodic protection crew, there is no formal hand-over and take over procedure.
• There was no working platform for use by the CP crew in carrying out the Cathodic protection job on the cage even though there were more than ten people working on the top of the cage.

Corrective actions and recommendations:
• Contractor holds controls and co-ordinates the multiple activities going on at the site. Rebar cages are not designed for a load of so many people. Contractor to ensure that toolbox talk is more focussed on the hazards associated with the job.
• Contractor to ensure adequate shuttering and scaffolding to be used during construction phase to support workers load who work on the steel cage to prevent from collapsing.
• Contractor to establish a formal hand-over and take over procedure amongst the different disciplines and shift changes and implement immediately.
• Ensure that the Method Statement always specifies the activities to be carried out in detail and JSA associated with the various activities are properly addressed and adequate number of supervisors and their availability.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)
• People (acts): Following Procedures: Improper position (in the line of fire)
• People (acts): Use of Protective Methods: Inadequate use of safety systems
• People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
• Process (conditions): Organisational: Inadequate training/competence
• Process (conditions): Organisational: Inadequate work standards/procedures
• Process (conditions): Organisational: Inadequate hazard identification or risk assessment
• Process (conditions): Organisational: Inadequate supervision

UAE
Function: Production
Category: Explosions or Burns
Activity: Production Operations

Narrative:
While collecting an oil sample the oil in the metal bucket caught fire. The operator suffered a minor burn to his right index finger. The fire was attributed to static electricity and was extinguished immediately using a DCP portable fire extinguisher. There was no asset, plant, or equipment damage.

What went wrong:
• Build up of static electricity due to metal bucket not being earthed.

Corrective actions and recommendations:
• Review of sampling procedures and equipment with training on the subject.

Causal factors:
• People (acts): Following Procedures: Violation unintentional (by individual or group)

UAE
Function: Production
Category: Other
Activity: Production Operations

Narrative:
• Tripping of a platform due to dropping of communication with DCS, while loading the new DCS software.

What went wrong:
• Due to an erroneous data entry as a result of lack of concentration.

Corrective actions and recommendations:
• Slowing down data entry, enabling cross checking of data entered and confirmation before data upload.

Causal factors:
• People (acts): Inattention/Lack of Awareness: Lack of attention/distracted by other concerns/stress
## High Potential Events by Region

### UAE

**Function:** Production  
**Category:** Pressure Release  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
During installation of Halon 1301 cylinder, repetitive movement during alignment caused the securing pin to be dislodged, resulting in accidental Halon release. The three workers who were inside the room during Halon release were able to avoid personal injury by immediate evacuation and closing of the room doors.

**What went wrong:**
- Lack of stepwise procedure is main attribute to this incident.
- The Actuator should be installed last after connecting discharge pipe work.
- Cylinder should be mechanically secured inside the cage to avoid movement banging/injury during installation.
- Human error in wrong sequence of work.
- Execution time was late afternoon where fatigue of the personnel may attribute to the error.

**Corrective actions and recommendations:**
- Prepare stepwise procedure for reinstatement of Halon cylinders.
- Mechanical help, competent riggers to be provided during heavy lifts.
- Safety flash to be issued on company web
- Prompt and timely reporting to relevant site authorities
- Lessons to be shared with other assets/Group Companies/sister companies

**Causal factors:**
- People (acts): Use of Tools, Equipment, Materials and Products: Improper use/position of tools/equipment/materials/products
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices

### UAE

**Function:** Production  
**Category:** Struck by  
**Activity:** Transport – Water, incl. Marine activity

**Narrative:**
A supply vessel lost control and drifted into a bridge connecting two platforms. While maneuvering close to the boat landing of one of the platforms, the control system blocked in slow-backward motion position. Engine control was switched to manual from the engine room and the vessel drifted into and then along the bridge which separates the 2 platforms. The vessel stopped drifting before colliding with platform. Bridge is damaged (structure, pipes, wires).

**What went wrong:**
- Failure of the control system: failure of the CPU control card (short cut).
- No complete alternative control of engine available in the engine room (design).
- No recovery plan of control system to respond in such situation.

**Corrective actions and recommendations:**
- Failure modes of the control card of the CPU should be systematically investigated by a third party, independent of the vendor and make design recommendations to avoid single point failure.
- The CPU and signal performance between bridge control and CPU should be tested regularly.
- Small bags of silica gel should be put inside the casing of the CPU Unit in order to limit humidity.
- Full independent emergency control for both engines should be provided within the engine room.
- Emergency recovery plan should be prepared and implemented in case of loss of system control on the vessel bridge (permanent attendance in the engine room with communication to the bridge, activation of an emergency manual control system to pull the vessel out).

**Causal factors:**
- People (acts): Inattention/Lack of Awareness: Improper decision making or lack of judgment
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Inadequate communication
High Potential Events by Region

**UAE**

**Function:** Drilling  
**Category:** Falls from Height  
**Activity:** Lifting, Crane, Rigging, Deck operations

**Narrative:**
During the skidding-in of the rig cantilever, a floorman was standing at the end of the rig main deck, guiding a cement hose with a rope. The cement hose was lifted up using an air winch in order for it to pass clear of the main deck hand rail (one hand rail was removed to facilitate easy passing of the cement hose). The cement hose was entangled with a bracket at the skidding beam, compressing it, and then suddenly it became free – causing spring movement which pushed the floorman overboard. The floorman, who was wearing a work vest, was recovered safely and checked by rig medic and found in good health.

**What went wrong:**
- Improper position for the task. IP was standing in unsafe position.
- Unprotected work at height. Safety barriers were removed.
- Inadequate work planning. Changing the work condition without reassessment
- Inadequate working procedure, the current skidding in check list does not include working at height if the handrails are removed.

**Corrective actions and recommendations:**
- Skidding-in checklist and JSA should be reviewed and updated to include working at height procedure and disconnecting the hose during skidding operation
- Highlight at safety meeting that the removal of handrail can mean that working at height procedure must be followed.
- Review lifejacket applications and availability
- Amend the man-overboard procedure to Medivac the IP whatever his situation is. All offshore rigs to issue a procedure for recovery of a man overboard
- To modify the current design during major maintenance to avoid removal of handrails during skidding in and out operations. To change the current handrail design to be a foldable one.
- Review all overboard lines and elbows in all rigs and to reallocate them to avoid obstructions and over reaching
- All rigs must be equipped with search light

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
- Process (conditions): Work Place Hazards: Congestion, clutter or restricted motion
- Process (conditions): Organisational: Inadequate supervision
- Process (conditions): Organisational: Poor leadership/organisational culture

**UAE**

**Function:** Construction  
**Category:** Struck by  
**Activity:** Lifting, Crane, Rigging, Deck operations

**Narrative:**
During lifting of a Gas Processing Facilities Bridge from the cargo barge, the crane lifted the bridge before the sea fastenings were fully cut, causing the bridge to swing uncontrollably. The bridge hit the welding tunnel and flare boom of the barge, causing minor structural damage to both. The five men who were on the bridge during the free swing were unhurt.

**What went wrong:**
- Lack of documented roles of key Project Management Team personnel on board the barge.
- Key personnel involved in the lifting failed to identify potential hazards. Crane operator was not included in lifting plan meeting
- Overload indicator was not monitored. Safe Working Load was ignored.
- Crane overload signals are only flashing lights, which could be overlooked.
- Modifications to the sea fastening were not as per approved plans or procedure.

**Corrective actions and recommendations:**
- Company PMT to develop and document clear roles for all key personnel and ensure proper implementation via auditing and site visits
- Additional audible alarm to be installed outside the crane operator’s cabin to let others know of any potential overload condition
- Crane overload monitoring facility to be installed at the barge control tower
- Any deviation from original designs to be advised to PMT for review/ approval
- Barge emergency procedure and Company projects contingency plan to be reviewed to address failed crane load scenario
- PMT to ensure consistency of measurement units
- All projects should establish proper Management of Change procedures

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
- Process (conditions): Organisational: Poor leadership/organisational culture
## High Potential Events by Region

### North America

#### Onshore

**USA**  
**Function:** Production  
**Category:** Explosions or Burns  
**Activity:** Construction, Commissioning, Decommissioning

**Narrative:**
During installation of an aboveground water treatment (AWT) vessel while performing permitted hot work a fire started in a drain tank that is connected to the treatment vessel. The fire resulted in an explosion and overpressure of the drain tank. The tank separated from its base and lifted off. There were no injuries. A small grass fire was started which was quickly brought under control.

**What went wrong:**
- The drain tank was configured so that air can displace liquid through the automatic tank gauge (Varec). Oxygen could also be introduced through the drain line from the water draw box and the tank overflow
- There was no standard which requires an isolation valve to be installed at every AWT look box
- Potential for the presence of flammable vapors in open ended lines from the drain tank was not identified prior to the permitted hot work taking place
- Requirements to isolate drain lines by plugging and filling with water had been removed from the managing safe work permitting documentation when the document was last updated.

**Corrective actions and recommendations:**
- Review the design of closed-top drain tanks and make corrective recommendations to reduce the likelihood of the introduction of explosive vapor mixtures into the vapor spaces of these types of tanks
- Conduct a survey of all light oil gauge settings and verify that all look boxes have an isolation valve
- Revise hot work permitting document to include requirement for inspecting and sealing/isolating open drains/vents.

**Causal factors:**
- Process (conditions): Protective Systems: Inadequate/defective warning systems/safety devices
- Process (conditions): Work Place Hazards: Hazardous atmosphere (explosive/toxic/asphyxiant)
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment

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**USA**  
**Function:** Production  
**Category:** Explosions or Burns  
**Activity:** Maintenance, Inspection, Testing

**Narrative:**
Contract maintenance crew had finished replacing steam valves and was returning steam to the system when a pipe failed, resulting in a release of high pressure steam. A contract employee directly in front of the release received serious burns over a large portion of their body.

**What went wrong:**
- A welded steam line failed in an elbow at the steam manifold header
- The steam system inspection program in place at the time did not identify the point of failure as an inspection point
- Work was being conducted while the steam system was being energized
- The injured party (along with others) were in the line of fire.

**Corrective actions and recommendations:**
- The need to operate within system erosion velocities
- Review and update steam system inspection programs to include additional identified areas and points of inspection
- Shutdown steam system prior to insulation removal to minimize personnel exposure, and determine hazards, including external deformation of piping.

**Causal factors:**
- People (acts): Following Procedures: Improper position (in the line of fire)
- People (acts): Use of Tools, Equipment, Materials and Products: Servicing of energized equipment/inadequate energy isolation
- Process (conditions): Organisational: Inadequate work standards/procedures
- Process (conditions): Organisational: Inadequate hazard identification or risk assessment
### High Potential Events by Region

**USA**

**Function:** Drilling  
**Category:** Struck by  
**Activity:** Drilling, Workover, Well Services

**Narrative:**
Upon completion of drilling the surface hole the crew was prepping to run 8 5/8” casing. The driller (injured party) and rig manager had agreed to have the driller go on to the floor and assist the two short service employee floorhands with the first few joints. The rig manager moved over to the console to operate the rig while running the casing. The Rig Manager positioned the elevators over the box end of the first joint of casing, which was over 40 feet in length. The Driller ensured that the elevators were rigged up and he latched the elevators around the first joint and put the latching pin in place. The rig manager, operating the console began to pick up the first joint of casing from the pipe wrangler with the elevators. When the collar/box end of the joint of casing reached approximately 39 feet up the joint the collar/box end slipped through the latched elevators, falling back to the rig floor and slid down the pipe wrangler, coming to rest on the ground at the far end of the wrangler. During this event, the Driller was struck in the head sustaining multiple injuries.

**What went wrong:**
- The elevators were 9 5/8 inch and the casing was 8 5/8 inch
- The elevators and collar/box end of the casing were not measured using calipers to ensure that the elevators being used were the correct size for the casing being picked up
- The contract drilling company uses a color coding system to help visually identify elevator and slip size on their casing running tools. The color code system was not adhered to by the crew doing the work
- The Driller was standing between the derrick leg and the casing that was being picked up, which put him in the line of fire.

**Corrective actions and recommendations:**
- Use calipers to measure the elevators and the collar/box end of the casing to ensure that the elevators are the right size prior to picking up casing
- When using lifting equipment, ensure that all personnel are out of the line of fire.

**Causal factors:**
- People (acts): Following Procedures: Violation unintentional (by individual or group)
- People (acts): Following Procedures: Improper position (in the line of fire)
- Process (conditions): Organisational: Inadequate work standards/procedures
H I G H  P O T E N T I A L  E V E N T S  B Y  R E G I O N

South America

Onshore

Colombia
Function: Drilling
Category: Struck by
Activity: Transport – Land

Narrative:
During Frac Tank transportation by road the truck almost fell in to an Abyss.

What went wrong:
• Inadequate Truck selection (3 axles instead 2), Poor hazard Identification

Corrective actions and recommendations:
• When selecting trucks for carry on Frac Tanks is necessary to use small trucks 4 wheels instead 6 wheels (in spanish Patin)

Causal factors:

Offshore

Brazil
Function: Drilling
Category: Struck by
Activity: Maintenance, Inspection, Testing

Narrative:
While drill crew was swapping over mud hose from standpipe #2 onto standpipe #1 outlet, an approx. 7kg sledge hammer head separated from the handle and dropped approx. 94 feet from derrick landing on the drill floor. A leak was discovered in a standpipe line during Drilling operations, the decision was made to pull out of hole into the shoe to make the well safe. The task involved would be to change the mud hose from standpipe-1 over onto standpipe-2.

Think Plan was completed and a pre-job meeting was conducted for task of working at height changing the mud hose P.T.W. and man riding check list completed.

The area around the Drill Floor was secured and barrier tape erected also PA Announcements were made. At 13.30 the task of change over of mud hose commenced within the Derrick. Using a sledge hammer connection between standpipe gooseneck and mudhose union was knocked free. Following the freeing of the union the hammer head parted from the handle falling to the rig floor. The operation was suspended and person taken down from Derrick.

Following the incident TOFS was indicated and a MOC incorporated to successfully change the hose.

What went wrong:
• Tool used was not the approved designed tethered tool for working at height.

Corrective actions and recommendations:
• Identify and Source correct Tethered Tools for a task of this nature
• Review and update TSTP for Working at Height
• Refresher of Drops Training for all personnel assigned to Rig
• Re-issue and review with all personnel assigned to rig HSE Alert HQS-HSE-AL-103
• Hazard Hunt to identify potentially damaged sledge hammers
• Review with Contractor QHSE approved standards for sledge hammers
• Review with Training department for suitable courses for hazard identification training.

Causal factors:
• Process (conditions): Protective Systems: Inadequate/defective guards or protective barriers
• Process (conditions): Protective Systems: Inadequate security provisions or systems
• Process (conditions): Tools, Equipment, Materials & Products: Inadequate design/specification/management of change
Appendix E
Glossary of terms

Caught in, under or between
Injuries where the injured person(s) is(are) crushed or similarly injured in non-impact cases, eg between machinery moving parts or other objects, caught between rolling tubulars, crushed between a ship and a dock, or similar incidents.

Company employee
Any person employed by and on the payroll of the reporting Company, including corporate and management personnel specifically involved in exploration and production. Persons employed under short-service contracts are included as Company employees provided they are paid directly by the Company.

Construction (as a work function)
All construction and fabrication activities and also disassembly, removal and disposal (decommissioning) at the end of the facility life. Construction of process plant, fabrication yard construction of structures, offshore installation, hook-up and commissioning, and removal of redundant process facilities are all examples to be included.

Contractor
A ‘Contractor’ is defined as an individual or organisation performing work for the reporting company, following verbal or written agreement. ‘Sub-contractor’ is synonymous with ‘Contractor’.

Contractor employee
Any person employed by a Contractor or Contractor’s Sub-Contractor(s) who is directly involved in execution of prescribed work under a contract with the reporting Company.

Drilling (as a work function)
All exploration, appraisal and production drilling and workover as well as their administrative, engineering, construction, materials supply and transportation aspects. It includes site preparation, rigging up and down and restoration of the drilling site upon work completion. Drilling includes ALL exploration, appraisal and production drilling.

Event
An unplanned or uncontrolled outcome of a business operation or activity that has or could have contributed to an injury, illness, physical or environmental damage.

Exploration (as a work function)
Geophysical, seismographic and geological operations, including their administrative and engineering aspects, construction, maintenance, materials supply, and transportation of personnel and equipment; excludes drilling.

Explosion or burn
Incident caused by burns, toxic gases, asphyxiation or other effects of fires and explosions. ‘Explosion’ means a rapid combustion, not an overpressure.

Exposure electrical
Includes incidents that involve electrical shock or electrical burns, etc.

Fall from height
Incident caused by falling off, over or onto something.

Fatal accident rate (FAR)
The number of company/contractor fatalities per 100,000,000 (100 million) hours worked.

Fatal incident rate (FIR)
The number of fatal incidents per 100,000,000 (100 million) hours.
Note: 3rd party fatalities were included until 2005

Fatality
Cases that involve one or more people who died as a result of a work-related incident or occupational illness.

First aid case
Cases that are not sufficiently serious to be reported as medical treatment or more serious cases but nevertheless require minor first aid treatment, eg dressing on a minor cut, removal of a splinter from a finger. First aid cases are not recordable incidents.

High potential event
Any incident or near miss that could have realistically resulted in one or more fatalities.

Hours worked
The actual ‘hours worked’, including overtime hours, are recorded in the case of onshore operations. The hours worked by an individual will generally be about 2,000 per year. For offshore workers, the ‘hours worked’ are calculated on a 12 hour work day. Consequently, average hours worked per year will vary from 1,600 to 2,300 hours per person depending upon the on/off shift ratio. Vacations and leaves are excluded.

Hours worked in year (000’s)
Hours are rounded to the nearest thousand.

Incident
An unplanned or uncontrolled event or chain of events that has resulted in recordable injury or illness, or physical or environmental damage.
**Key Performance Indicators (KPI)**

In this report, these include: number of fatalities, fatal accident and incident rates, lost time injury frequency, restricted work day case + lost time injury frequency and total recordable injury rate.

**Land transport/vehicle incident**

Incidents involving motorised vehicles designed for transporting people and goods over land, e.g. cars, buses, trucks. Pedestrians struck by a vehicle are classified as vehicle incidents. Fatal incidents from a mobile crane would only be vehicle incidents if the crane were being moved between locations.

**Lost time injury (LTI)**

A fatality or lost work day case. The number of LTIs is the sum of fatalities and lost work day cases.

**Lost time injury frequency (LTIF)**

The number of lost time injuries (fatalities + lost work day cases) incidents per 1,000,000 hours worked.

**Lost work day case (LWDC)**

Any work related injury other than a fatal injury which results in a person being unfit for work on any day after the day of occurrence of the occupational injury. “Any day” includes rest days, weekend days, leave days, public holidays or days after ceasing employment.

**LWDC severity**

The average number of lost days per lost work day case.

**Medical cause of death**

This is the cause of death given on the death certificate. Where two types of causes are provided, such as “pulmonary oedema” caused by “inhalation of hot gases from a fire”, both are recorded.

**Medical treatment case (MTC)**

Cases that are not severe enough to be reported as fatalities or lost work day cases or restricted work day cases but are more severe than requiring simple first aid treatment.

**Near miss**

An unplanned or uncontrolled event or chain of events that has not resulted in recordable injury, illness, physical or environmental damage but had the potential to do so in other circumstances.

**Number of days unfit for work**

The sum total of calendar days (consecutive or otherwise) after the days of the occupational injuries on which the employees involved were unfit for work and did not work.

**Number of employees**

Average number of full-time and part-time employees involved in exploration & production, calculated on a full-time basis, during the reporting year.

**Number of fatalities**

The total number of Company’s employees and or Contractor’s employees who died as a result of an incident. ‘Delayed’ deaths that occur after the incident are included if the deaths were a direct result of the incident. For example, if a fire killed one person outright, and a second died three weeks later from lung damage caused by the fire, both are reported.

**Occupational injury**

Any injury such as a cut, fracture, sprain, amputation, etc which results from a work-related activity or from an exposure involving a single incident in the work environment, such as deafness from explosion, one-time chemical exposure, back disorder from a slip/trip, insect or snake bite.

**Offshore work**

All activities and operations that take place at sea, including activities in bays, in major inland seas such as the Caspian Sea, or in other inland seas directly connected to oceans. Incidents including transportation of people and equipment from shore to the offshore location, either by vessel or helicopter, should be recorded as ‘offshore’.

**Onshore work**

All activities and operations that take place within a landmass, including those on swamps, rivers and lakes. Land-to-land aircraft operations are counted as onshore, even though flights are over water.

**Other**

‘Other’ is the category to specify where the injury cannot be logically classed under other headings.

*Note: the work function ‘Other’ was replaced by ‘construction’ for the first time in 2006.*
Production (as a work function)

Petroleum and natural gas production operations, including administrative and engineering aspects, repairs, maintenance and servicing, materials supply and transportation of personnel and equipment. It covers all mainstream production operations including:

- work on production wells under pressure
- oil (including condensates) and gas extraction and separation (primary production)
- heavy oil production where it is inseparable from upstream (i.e. stream assisted gravity drainage) production
- primary oil processing (water separation, stabilisation)
- primary gas processing (dehydration, liquids separation, sweetening, CO₂ removal)
- Floating Storage Units (FSUs) and sub-sea storage units
- gas processing activities with the primary intent of producing gas liquids for sale
  - secondary liquid separation (i.e. Natural Gas Liquids [NGL] extraction using refrigeration processing)
  - Liquefied Natural Gas (LNG) and Gas to Liquids (GTL) operations
- flow-lines between wells and pipelines between facilities associated with field production operations
- oil and gas loading facilities including land or marine vessels (trucks and ships) when connected to an oil or gas production process
- pipeline operations (including booster stations) operated by company E&P business

Production excludes:

- production drilling or workover
- mining processes associated with the extraction of heavy oil tar sands
- heavy oil when separable from upstream operations
- secondary heavy oil processing (upgrader)
- refineries.

Recordable

A type of event, incident, injury, illness, release or other outcome which has been determined to meet or exceed definitions, criteria or thresholds for inclusion and classification in reported data.

Restricted work day case (RWDC)

Any work-related injury other than a fatality or lost work day case which results in a person being unfit for full performance of the regular job on any day after the occupational injury. Work performed might be:

- an assignment to a temporary job;
- part-time work at the regular job;
- working full-time in the regular job but not performing all the usual duties of the job

Where no meaningful restricted work is being performed, the incident is recorded as a lost work day case (LWDC).

Struck by

Incidents where injury results from being hit by moving equipment and machinery, or by flying or falling objects.

Third party

A person with no business relationship with the company or contractor.

Total recordable injury rate (TRIR)

The number of recordable injuries (fatalities + lost work day cases + restricted work day cases + medical treatment cases) per 1,000,000 hours worked.

Unspecified (as a work function)

Unspecified is used for the entry of data associated with office personnel whose work hours and incident data cannot be reasonably assigned to the administrative support of one of the function groupings of exploration, drilling, production or construction. Corporate overhead support function personnel such as finance or human resources staff may be examples where work hours cannot be specifically assigned to a particular function. All other data that are not separated out by function are reported as ‘unspecified’.

Water related

Incidents in which water played a significant role.

Work-related injury

See occupational injury.
## Appendix F

### Contributing companies

The table below shows the size of the database in thousands of hours worked for each contributing company and whether reported data includes information on contractor statistics, breakdown by function, medical treatment cases, restricted work day cases, and days lost following lost work day and restricted work day cases. All company submissions include data on numbers of fatalities and lost work day cases.

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<th>Data by function</th>
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<th>RWDCs</th>
<th>LWDC days</th>
<th>RWDC days</th>
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**Note:**
- A data row is a single entry for a company for one country and location (one of company onshore, company offshore, contractor onshore, contractor offshore), e.g. Acompany, UK, company offshore.
- Yes = reported for all data rows
- Mostly = reported for more than 50% of data rows
- Partly = reported for less than 50% of data rows
- No = not reported at all
## Appendix G
### Countries represented

The tabulation shows the breakdown of reported hours worked in regions and countries. Also shown is the number of companies reporting data in each country. The table does not necessarily show all hours worked in the exploration & production sectors of the oil & gas industry in each country.

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Appendix H

Health Performance Indicators

In 2007, the combined Health Committee of OGP and IPIECA published a guidance document called Health Performance Indicators – a guide for the oil and gas industry. At the time there was no globally applied set of health performance indicators within the industry. OGP had previously captured occupational illness data but this was a lagging indicator of performance, often reflecting health management many years previously. The new publication highlighted the possibility of using a 3 tier Health Management System (HMS) approach to assessing performance:

- Tier 1 – Implementation of a Health Management System
- Tier 2 – Detailed Leading Indicators in support of Tier 1
- Tier 3 – One Lagging Indicator – the reporting of work-related illness

In 2008 the Health Committee agreed to collect data on tier 1, using a very simple traffic-light system to give a visual indication of the extent to which 8 areas of health were managed:

1) health risk assessment and planning;
2) industrial hygiene and control of workplace exposures;
3) medical emergency management;
4) management of ill-health in the workplace;
5) fitness for task assessment and health surveillance;
6) health impact assessment;
7) health reporting and record management; and
8) public health interface and promotion of good health.

Each of the eight elements included a qualitative description covering the key aspects of what needed to be done to adequately manage health in any business. Health Committee members agreed that they were a reasonable representation of what they aspired to do in their own organisations.

One of the strengths of this approach was that it focused only on what needed to be done, not on how to do it or who would do it. This made it more broadly acceptable to different organisational structures, cultures and management styles.

In 2009, the process was enhanced: the extent of global application of these eight elements within individual oil & gas companies was recorded using a simple percentage tool. Both the 2008 and 2009 pilots yielded results in the form of radar charts for each business and a mean for the industry. In order to enable a more detailed gap analysis at corporate, function, site or regional level, a more detailed assessment tool was developed for 2010. This could be used within individual companies for gap analysis and the data could be aggregated for benchmarking between companies. 19 companies took part in the high level HPI assessment between 2008 and 2010 and ten also completed the detailed gap analysis.

The Health Committee considers this health management system approach will serve as a useful mechanism to promote broader understanding of health management concepts among non-health professionals within our industry and may even help companies that have less well developed health management systems.

The 2008–2010 information gathered remains with the Health Committee but there is agreement that from 2011 grouped data from new assessments can be published by OGP.
For further information and publications, please visit our website at

www.ogp.org.uk