

# AzSPU 2010 HSSE & Operations Integrity Risk Matrix

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|                              |  |  |                                    |                                     |
|------------------------------|--|--|------------------------------------|-------------------------------------|
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| <b>Scope:</b>                | AzSPU  |  | <b>Document<br/>Administrator:</b> | HSE Document<br>Coordinator         |
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| <b>Next Review<br/>Date:</b> | 26 November 2011                             |  |                                    |                                     |

## 2010 AzSPU Risk Matrix (final version, Group risk resubmission work on Nov 26th 2010) – HSE Impact

| AzSPU S&O Risk Register (Combined Re-submission Nov 26th 2010) |   |          |            |                 |         |
|--|---|----------|------------|-----------------|---------|
|  | Title   | Severity | Likelihood | Type            | Notify  |
| 1  | Loss of well containment – well interventions                               | B        | 3          | Health & Safety | Segment |
| 2  | Loss of well control – well testing / flow back                             | B        | 3          | Health & Safety | Segment |
| 3  | HC release fire/explosion in process area due to mechanical failures        | B        | 3          | Health & Safety | Segment |
| 4  | Offshore seismic event - Azeri & DWG platforms                              | B        | 3          | Health & Safety | Segment |
| 5  | Offshore seismic event - Chirag platform                                    | B        | 3          | Health & Safety | Segment |
| 6  | Offshore seismic event - SDA platform                                       | B        | 3          | Health & Safety | Segment |
| 7  | Loss of well integrity  | C        | 5          | Health & Safety | Segment |
| 8  | Process safety incident on Chirag   | C        | 5          | Health & Safety | Segment |
| 9  | Loss of primary containment during well construction                        | C        | 4          | Health & Safety | Segment |
| 10   | Helicopter incident   | C        | 4          | Health & Safety | Segment |
| 11   | Inadequate air based search and rescue capability                           | C        | 4          | Health & Safety | Segment |
| 12   | Oil spill incident response capability                                      | C        | 4          | Environmental   | Segment |
| 13   | SCP failure due to 3rd Party Damage   | C        | 3          | Health & Safety | SPU     |
| 14   | High energy vessel collision  | C        | 3          | Health & Safety | SPU     |
| 15   | Process safety incident resulting from non functioning relief/flare systems | C        | 3          | Health & Safety | SPU     |
| 16   | Process safety incident resulting from inadequate org capability            | C        | 3          | Health & Safety | SPU     |
| 17   | BTC failure due to natural hazards  | C        | 3          | Environmental   | SPU     |
| 18   | Pipeline integrity: natural hazards (WREP)                                  | D        | 6          | Environmental   | Segment |
| 19   | Subsea pipeline rupture due to marine traffic                               | D        | 4          | Environmental   | SPU     |
| 20   | Damage to WREP/BTC export pipelines by third parties                        | E        | 7          | Environmental   | SPU     |
| 21   | Lifting/Dropped object failure  | E        | 6          | Health & Safety | SPU     |
| 22   | Fatal vehicle accident  | E        | 6          | Health & Safety | SPU     |
| 23   | Drowning/man overboard  | E        | 6          | Health & Safety | SPU     |
| 24   | Loss of pipeline integrity due to poor quality of Soviet era pipes (WREP)   | E        | 6          | Environmental   | SPU     |
| 25   | Floating roof failure leading to oil tank fire at Sangachal                 | E        | 5          | Environmental   | SPU     |
| 26   | SDA conductor failure   | E        | 4          | Health & Safety | SPU     |
| 27   | Subsea pipeline leak due to internal corrosion                              | E        | 4          | Environmental   | SPU     |

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|                | Likelihood of Risk Event  |  |  |  |   |  |  |   |
|----------------|---|--|--|--|---|--|--|---|
|                | 1   | 2  | 3  | 4  | 5   | 6  | 7  | 8   |
| Severity Level | A similar event has not yet occurred in our industry and would only be a remote possibility | A similar event has not yet occurred in our industry | Similar event has occurred somewhere in our industry | Similar event has occurred somewhere within the BP Group | Similar event has occurred, or is likely to occur, within the lifetime of 10 similar facilities | Likely to occur once or twice in the facility lifetime | Event likely to occur several times in the facility lifetime | Common occurrence (at least annually) at the facility |
| A              | 8   | 9  | 10   | 11   | 12  | 13   | 14   | 15  |
| B              | 7   | 8  | 1 2 3 4 5 6  | 10   | 11  | 12   | 13   | 14  |
| C              | 6   | 7  | 7 8 9 10 11 12 13 14 15 16 17                        | 9 10 11 12   | 7 10 8  | 11   | 12   | 13  |
| D              | 5   | 6  | 7  | 19 8   | 9   | 18 10  | 11   | 12  |
| E              | 4   | 5  | 6  | 26 7 27  | 25 8  | 21 22 23 24 9  | 20 10  | 11  |
| F              | 3   | 4  | 5  | 6  | 7   | 8  | 9  | 10  |
| G              | 2   | 3  | 4  | 5  | 6   | 7  | 8  | 9   |
| H              | 1   | 2  | 3  | 4  | 5   | 6  | 7  | 8   |
| Frequency      | $10^{-6}$ /yr or lower  | $>10^{-6}$ to $10^{-5}$ /yr                          | $>10^{-5}$ to $10^{-4}$ /yr                          | $>10^{-4}$ to $10^{-3}$ /yr                              | $>10^{-3}$ to $10^{-2}$ /yr   | $>10^{-2}$ to $10^{-1}$ /yr                            | $>10^{-1}$ to 1 /yr  | $>1$ / yr   |
| Probability    | $10^{-6}$ or lower  | $>10^{-6}$ to $10^{-5}$                              | $>10^{-5}$ to $10^{-4}$                              | $>10^{-4}$ to $10^{-3}$                                  | $>10^{-3}$ to $10^{-2}$   | $>.01$ to 0.1  | $>.1$ to 0.25  | $>.25$  |

# **HSE and Business Impacts Descriptions**

| SEVERITY |  | HEALTH AND SAFETY   | ENVIRONMENTAL  |
|----------|--|---|--|
| A        |  | Comparable to the most catastrophic health/ safety incidents ever seen in industry.<br>The potential for 100 or more fatalities (or onset of life threatening health effects) shall always be classified at this level.   | <ul style="list-style-type: none"><li>●Future impact, e.g., unintended release, with widespread damage to any environment and which remains in an "unsatisfactory" state for a period &gt; 5 years.</li><li>●Future impact with extensive damage to a sensitive environment and which remains in an "unsatisfactory" state for a period &gt; 5 years.</li><li>●Future impact with widespread damage to a sensitive environment and which can only be restored to a "satisfactory"/agreed state in a period of more than 1 and up to 5 years.</li></ul>   |
| B        |  | Catastrophic health/ safety incident causing very widespread fatalities within or outside a facility.<br>The potential for 50 or more fatalities (or onset of life threatening health effects) shall always be classified at this level.  | <ul style="list-style-type: none"><li>●Future impact with extensive damage to a non-sensitive env. and which remains in an "unsatisfactory" state for a period &gt; 5 years.</li><li>●Future impact with extensive damage to a sensitive environment and which can only be restored to a "satisfactory"/agreed state in a period of more than 1 and up to 5 years.</li><li>●Future impact with widespread damage to a non-sensitive environment and which can only be restored to a "satisfactory"/agreed state in a period of more than 1 and up to 5 years.</li><li>●Future impact with widespread damage to a sensitive env. which can be restored to an equivalent capability around 1 year.</li></ul> |
| C        |  | Catastrophic health/ safety incident causing widespread fatalities within or outside a facility.<br>The potential for 10 or more fatalities (or onset of life threatening health effects) shall always be classified at this level.   | <ul style="list-style-type: none"><li>●Future impact with extensive damage to a non-sensitive environment and which can only be restored to a "satisfactory"/agreed state in a period of more than 1 and up to 5 years.</li><li>●Future impact with widespread damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of around 1 year.</li><li>●Future impact with extensive damage to a sensitive env. which can be restored to an equivalent capability in a period of around 1 year.</li><li>●Future impact with widespread damage to a sensitive env. which can be restored to an equivalent capability in a period of months.</li></ul>             |
| D        |  | Very major health/ safety incident<br>The potential for 3 or more fatalities (or onset of life threatening health effects) shall always be classified at this level.<br>30 or more injuries or health effects, either permanent or requiring hospital treatment for more than 24 hours. | <ul style="list-style-type: none"><li>●Future impact with extensive damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of around 1 year.</li><li>●Future impact with localized damage to a sensitive environment and which can be restored to an equivalent capability in a period of around 1 year.</li><li>●Future impact with widespread damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of months.</li><li>●Future impact with extensive damage to a sensitive env. and which can be restored to an equivalent capability in a period of months.</li></ul>                                |
| E        |  | Major health/ safety incident<br>1 or 2 fatalities, acute or chronic, actual or alleged.<br>10 or more injuries or health effects, either permanent or requiring hospital treatment for more than 24 hours.   | <ul style="list-style-type: none"><li>●Future impact with localized damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of around 1 year.</li><li>●Future impact with extensive damage to a non-sensitive env which can be restored to an equivalent capability in a period of months.</li><li>●Future impact with localized damage to a sensitive env. which can be restored to an equivalent capability in a period of months.</li><li>●Future impact with extensive damage to a sensitive env. which can be restored to an equivalent capability in a period of days or weeks.</li></ul>  |
| F        |  | High impact health/ safety incident<br>Permanent partial disability(ies)<br>Several non-permanent injuries or health impacts.<br>Days Away From Work Case (DAFWC)   | <ul style="list-style-type: none"><li>●Future impact with localized damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of months.</li><li>●Future impact with immediate area damage to a sensitive env. which can be restored to an equivalent capability in a period of months.</li><li>●Future impact with extensive damage to a non-sensitive env. which can be restored to an equivalent capability in days or weeks.</li><li>●Future impact with localized damage to a sensitive env. which can be restored to an equivalent capability in a period of days or weeks.</li></ul>  |
| G        |  | Medium impact health/ safety incident<br>Single or multiple recordable injury or health effects from common source/event.   | <ul style="list-style-type: none"><li>●Future impact with immediate area damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of months.</li><li>●Future impact with localized damage to a non-sensitive env. which can be restored to an eq. capability in a period of days or weeks.</li><li>●Future impact with immediate area damage to a sensitive environment and which can be restored to an equivalent capability in a period of days or weeks.</li></ul>   |
| H        |  | Low impact health/ safety incident. First aid. Single or multiple over-exposures causing noticeable irritation but no actual health effects   | <ul style="list-style-type: none"><li>●Future impact with immediate area damage to a non-sensitive environment and which can be restored to an equivalent capability in a period of days or weeks.</li></ul>   |

| SEVERITY* | Non-Financial Impact  | Financial Impact<br>(EQUIPMENT DAMAGE,<br>BUSINESS VALUE<br>LOST) |
|-----------|---|---|
|           | Public or investor outrage on a global scale.<br>Threat of global loss of license to operate.   | >\$20 billion   |
| B         | Loss of license to operate a major asset in a major market – US, EU, Russia.<br>Intervention from major Government – US, UK, EU, Russia.<br>Public or investor outrage in major western markets – US, EU.<br>Damage to relationships with key stakeholders of benefit to the Group.   | \$5 billion - \$20 billion  |
| C         | Loss of license to operate other material asset, or severe enforcement action against a major asset in a major market.<br>Intervention from other major Government.<br>Public or investor outrage in other material market where we have presence or aspiration.  | \$1 billion - \$5 billion   |
| D         | Severe enforcement action against a material asset in a non-major market, or against other assets in a major market.<br>Interventions from non-major Governments.<br>Public or investor outrage in a non-major market, or localised or limited “interest-group” outrage in a major market.<br>Prolonged adverse national or international media attention.<br>Widespread adverse social impact.<br>Damage to relationships with key stakeholders of benefit to the Segment. | \$100 m to \$1 billion  |
| E         | Other adverse enforcement action by regulators.<br>Limited “interest-group” outrage in non major market.<br>Short term adverse national or international media coverage.<br>Damage to relationships with key stakeholders of benefit to the SPU.  | \$5m - \$100 m  |
| F         | Regulatory compliance issue which does not lead to regulatory or other higher severity level consequence<br>Prolonged local media coverage.<br>Local adverse social impact.<br>Damage to relationships with key stakeholders of benefit to the Performance Unit (PU).   | \$500k-\$5m   |
| G         | Short term local media coverage.<br>Some disruption to local operations (e.g., loss of single road access less than 24 hours).  | \$50k - \$500k  |
| H         | Isolated and short term complaints from neighbours (e.g., complaints about specific noise episode).   | <\$50k  |