Vessel Facilities

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Manager Assessment and Inspection – Vessel Facilities

Offshore Support Vessel Conference - 9 December - Perth
• Defining a facility
  – In General
  – Excluded activities
• Working at or near a hydrocarbon facility
  – A case study
  – Safety Case implications
Defining a facility –
General case
A Vessel or structure is a facility;
While Located at a site in Commonwealth waters,

Relevant State/NT Minister
or
NOPSEMA where powers conferred
And is being used, or prepared for use at that site for the:

• Recovery or, processing or, storage and offloading of petroleum, or
• Accommodation for persons working on another facility, or
• Drilling or servicing a well, or
• Laying pipes for petroleum, or
• Erection, dismantling or decommissioning of a vessel or structure mentioned above.
Defining a facility – Excluded activities
• Vessel supporting a remotely-operated vehicle or diving operation in connection with non-intrusive work;
• Vessels undertaking subsea “earthworks” foundation works prior to structure installation / pipelay;
• Vessels placing / installing / attaching manifolds, jumpers, cathodic protection;
• Dumb barge that is “hipped-up” to a facility
• Key qualifiers:
  – No petroleum or greenhouse gas substance
    • installing and attaching a jumper
  – Prior to hydro-testing
    • removal of weight coating from a pipe
    • rock dumping on a pipe during its construction
    • pipe trenching & burial during facility construction
    • placing a subsea pipe manifold or pipe end manifold during facility construction
  – Welding is not required
    • attaching a cathodic protection anode to a pipe
Working on, or in close proximity to, Hydrocarbon facilities – Case Study
Montara case study

Friday 21st August 2009

Java Constructor (JC) was located 25 metres from Montara WHP and West Atlas Drill Rig with a POB of 174. Operating under a Hot Work Permit from West Atlas.

07:23 Well kicked, oil & gas column blew against underside of cantilever, emergency response procedures activated

07:25 Rig advises uncontrolled hydrocarbon release

07:25 JC Superintendent advises to clear the deck

07:27 JC starts to move away from Rig/WHP

07:40 JC moved 500m from Rig/WHP

07:45 General muster alarm is sounded on JC
08:06 Rig abandoned, life boats launched.
08:50 Life boats recovered to anchor handlers
09:50 Transfer of crew to Vessel, POB becomes 236
12:50 Hydrocarbons surround Vessel

13:14 Superintendent orders evacuation of area.

Vessel cuts anchors S3 and P4 using an oxyacetylene torch (Hot work)

14:38 Vessel towed clear of area
A case study(4)

1 November 2009
5th attempt intersected H1 well
12:10: Fire breaks out on WHP

3 November 2009
hydrocarbon flow stopped,
fire extinguished
• Safety Case did not anticipate operating in the vicinity of an uncontrolled hydrocarbon release.
• Emergency documentation and training were therefore inadequate.
• Muster stations were outside only – should have had inside alternative.
• Poor and irregular briefing of crew.
• Training of supervisors in communications.
• No cold cutting alternative for anchor wires.
• No permanently mounted gas detection equipment.
Outcomes - vessel operator

• Enforcement by NOPSEMA
  – Five improvement Notices
  – Request to revise safety case
  – Further request to revise safety case (2011)

• Action by operator
  – Notices addressed
  – Safety case revised (and accepted by NOPSEMA)
  – Safety case revised to remove working near hydrocarbon facilities (and accepted by NOPSEMA)
Working at or near:

Hydrocarbon facilities
- Safety Case implications
Activities

Facility Description
- Activities and Operating Parameters
- General Description (the layout of the facility)
- Machinery and Equipment

Description of Technical Controls including:
- Safety Measures
- Emergencies

Formal Safety Assessment Description
- HAZID
- Risk Assessment
- Emergencies (EERA, FERA)

Identification of Control Measures

Safety Management System Description
- Scope (Activities)
- Comprehensive and Integrated
- Description of Procedural Controls including:
  - OHS Risk Management
  - Maintenance
  - Communication
  - Safety Measures
  - Emergencies

Performance Standards

Corrective & Preventative action

Monitor, Audit and Review
- Implemented & Functional?
- Implementation and Improvement of the SMS

Operational Management

Corrective & Preventative action

Implemented & Functional?
“The safety case for a facility must contain a description of the facility that gives details of the activities that will, or are likely to, take place at, or in connection with, the facility”
“The safety case for the facility must also contain a detailed description of the formal safety assessment for the facility, being an assessment, or series of assessments, conducted by the operator”
“identifies all hazards having the potential to cause a major accident event”

Potential: capable of being or becoming
Credible: capable of being believed; believable

Macquarie Dictionary on-line
Risk Assessment

Facility Description
- Activities and Operating Parameters
- General Description (the layout of the facility)
- Machinery and Equipment

Description of Technical Controls including:
- Safety Measures
- Emergencies

Formal Safety Assessment Description
- HAZID

Monitor, Audit and Review

Identification of Control Measures

Safety Management System Description
- Scope (Activities)
- Comprehensive and Integrated

Description of Procedural Controls including:
- OHS Risk Management
- Maintenance
- Communication
- Safety Measures
- Emergencies

Performance Standards

Corrective & Preventative action

Implemented & Functional?

Implementation and Improvement of the SMS

Corrective & Preventative action

Implemented & Functional?
“a detailed and systematic assessment of the risk associated with each of those hazards, including the **likelihood** and **consequences** of each **potential** major accident event”
Supporting Studies

Facility Description
- Activities and Operating Parameters
- General Description (the layout of the facility)
- Machinery and Equipment

Description of Technical Controls including:
- Safety Measures
- Emergencies

Formal Safety Assessment Description
- HAZID
- Risk Assessment
- Emergencies (EERA, FERA)

Identification of Control Measures

Safety Management System Description
- Scope (Activities)
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- Description of Procedural Controls including:
  - OHS Risk Management
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  - Safety Measures
  - Emergencies

Performance Standards

Monitor, Audit and Review
- Corrective & Preventative action
- Implementation and Improvement of the SMS
- Implemented & Functional?
Evacuation, Escape and Rescue Analysis

- Identifying the types of emergencies
- Considering:
  - Primary and secondary routes for evacuation and escape
  - Procedures and equipment for evacuation, escape and rescue
  - Life saving equipment
- Identifying control measures to reduce risks to a level that is ALARP
Fire and Explosion Risk Analysis

• Identifying the types of fire and explosions

• Considering:
  – Measures for detection and elimination
  – Automatic and manual detection, control and extinguishment of outbreaks of fire and leaks or escapes of petroleum
  – Means to isolate and store hazardous substances
  – The EERA in relation to fires and explosions

• Identifying control measures to reduce risks to a level that is ALARP
Control Measures

- Facility Description:
  - Activities and Operating Parameters
  - General Description (the layout of the facility)
  - Machinery and Equipment

- Formal Safety Assessment Description:
  - HAZID
  - Risk Assessment
  - Emergencies (EERA, FERA)

- Safety Management System Description:
  - Scope (Activities)
  - Comprehensive and Integrated
  - Description of Procedural Controls including:
    - OHS Risk Management
    - Maintenance
    - Communication
    - Safety Measures
    - Emergencies

- Monitor, Audit and Review:
  - Implemented & Functional?
  - Corrective & Preventative action
  - Implemented & Functional?

- Implementation and Improvement of the SMS

- Identification of Control Measures

- Performance Standards

- Description of Technical Controls including:
  - Safety Measures
  - Emergencies

- Implementation and Improvement of the SMS

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“identifies the technical and other control measures that are necessary to reduce that risk to a level that is as low as reasonably practicable.”
Control Measures (3)

Hazard: Loss of hydrocarbon containment

Prevention Control measures

Mitigation Control measures

Fire / Explosion

Consequence: Multiple fatalities
**Consideration of:**

<table>
<thead>
<tr>
<th>Hardware Controls such as:</th>
<th>Procedural Controls such as:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas detection</td>
<td>SIMOPS plans</td>
</tr>
<tr>
<td>Ignition controls:</td>
<td>Permit to work system</td>
</tr>
<tr>
<td>- Ex rated external equipment</td>
<td>- Interface with hydrocarbon facility</td>
</tr>
<tr>
<td>- Gas ingress minimisation</td>
<td>- PTW system</td>
</tr>
<tr>
<td>- Emergency Shutdown Systems</td>
<td></td>
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<tr>
<td>- Engine over-speed shutdown</td>
<td></td>
</tr>
<tr>
<td>Disconnection from subsea infrastructure (Intrinsically safe line cutters)</td>
<td>Work Location with respect to wind, tide and hydrocarbon facility</td>
</tr>
<tr>
<td>Hydrocarbon facility SD/BD</td>
<td>Drift off vs drive off</td>
</tr>
<tr>
<td></td>
<td>Station Bill assignments</td>
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</tbody>
</table>
Potential Mitigation controls

Consideration of:

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<thead>
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<td>Fire dampers</td>
<td>SIMOPS plans</td>
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<tr>
<td>Internal Muster Stations / TR</td>
<td>Emergency response plans</td>
</tr>
<tr>
<td>Communications systems</td>
<td></td>
</tr>
<tr>
<td>TEMPSC (c/w deluge and air)</td>
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</table>
 Includes:

“the safety case is appropriate to the facility and to the activities conducted at the facility”
• Working at or near a hydrocarbon facility then an **Associated Offshore Place** (AOP)
• Host facility safety case needs to address risks to and from vessel
• **Same consideration of prevention and mitigation controls**
Thank You