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TO:

All OSD Inspectors

HID SI3 Pipelines Inspectors

RISER SAFETY IN UK WATERS – LESSONS FROM MUMBAI HIGH NORTH DISASTER

PURPOSE

This document provides guidance on work to be done by OSD (primarily IMTs) and HID SI (Pipelines) to seek reassurances from UK offshore and pipeline operators that there is a very low risk of an incident in UK waters arising from riser damage similar to that which occurred off Mumbai, India in 2005.

BACKGROUND

1. HSE (Steve Walker and Rae McIntosh) has been assisting the Indian Government in their investigation of the fire at the Mumbai High North (MHN) offshore production complex on 27 July 2005, when 22 workers died. The fire occurred when a multi-purpose support vessel (MSV) hit one of the exposed risers on the outside of the MHN platform, one of the two processing platforms. The MSV had come alongside MHN to transfer an injured person to the platform via personnel basket. The vessel was large, being longer than the platform itself, and at the time was experiencing problems with one of the azimuth thrusters - it was therefore under manual control during the approach. At some stage the helideck of the vessel struck one or more of the risers. A PowerPoint presentation about this disaster will be circulated to all IMT and HID (SI) Pipeline team leaders.

2. The Mumbai High North complex imported well fluids from normally unattended satellite wellhead platforms, exported oil to shore, and supplied gas for gas lift operations on the satellite platforms. The risers of the MHN platform (five 12" export gas lift at 1200psi, and ten 14/16" well fluid import) were situated outside the jacket, adjacent to the boat landing stage at spider

deck level. Riser protection guards were fitted just above sea level, but these were only designed for smaller offshore supply vessels (OSVs), not significantly larger MSVs.

ROOT CAUSES OF THE INCIDENT

3. The Indian Government Independent Inquiry into the disaster has yet to conclude its investigations, but their investigation is particularly looking into two broad areas:

- The adequacy of the risk assessment processes and subsequent controls that were adopted.
- The adequacy of the practices and procedures adopted by the installation in relation to ship/installation collision avoidance.

Further details will become available when the Inquiry report is eventually published.

STANDARDS

4. National and International standards in use within the UK promote the best practice of installing risers inside jacket structures. Codes are not mandatory and legislation focuses on hazard identification and risk assessment to achieve ALARP, thus allowing duty holders to adopt other equally effective approaches that achieve a comparable level of safety, normally demonstrated through a suitable and sufficient risk assessment (typically incorporating appropriate engineering/technical reviews/assessments and reports). Such an approach has provided other additional/alternative protective measures and controls within the UK as follows:

- Installation of fenders;
- Installing risers within caissons, well conductors and J Tubes;
- Not allowing risers to be located inside platform loading zones;
- Risers routed away from hazards such as fire, explosion and impact;
- Vessel loading/offloading/mooring not undertaken at riser locations;
- External risers not located on prevailing weather side of platform;
- Other operational procedural safety controls and permitry;
- Other marine operation and safety controls in the vicinity of offshore installations (see para 5);
- Provision of subsea isolation valves (SSIVs) to limit the consequences of any riser damage.

Hydrocarbon risers on UK offshore installations are generally considered as Safety Critical Elements and are therefore subject to independent verification and assessment

5. UKOOA's "Guidelines for Ship/Installation Collision Avoidance", Issue 1, December 2002 provides guidance on ship/installation collision avoidance and

the potential consequences of collision. It is the accepted standard of good practice within the UKCS.

ACTION PROPOSED

6. The Mumbai High North incident provides a salutary lesson for the offshore industry on the potential of offshore incidents involving riser damage. This is of such significance that HSE considers that the UK offshore industry should take the opportunity to reassess their existing precautions to ensure that the risk of riser damage on their platforms within the UKCS are reduced ALARP.

7. HSE therefore intends to formally ask the industry to undertake such riser safety reviews, and then to follow up to discuss the outcomes of these reviews on a duty holder by duty holder basis. The following action should therefore be taken: -

(a) Band 2s in OSD IMT teams to send a letter, based on the text at Appendix 1, to each of the production installation duty holders for which their team is the focal point. (NOTE: the draft text assumes only one installation – it will need to be amended for duty holders with many). By end of May 2006.

(b) Band 2s in HID SI (Pipeline) team to send a similar letter to each of their Pipeline Operators that are not production installation duty holders, if necessary liasing with the appropriate IMT to prevent duplication of approach to the same operator. By end of May 2006.

(c) IMTs and HID SI (Pipeline) teams to follow up these letters by meeting with duty holders during the period October - December 2006 to discuss the findings (where duty holders have no exposed risers, meetings may not be necessary). These meetings should confirm that the duty holder's own review has covered all the points detailed in the letter. Depending on the nature of the duty holder's own reassessment, further inspection of specific installations or procedures with appropriate topic specialists may be appropriate, and could form part of the normal duty holder inspection plans.

(d) It is not intended to ask for specific reports on this work. COIN will be interrogated to provide information centrally, so inspectors should ensure that a suitable summary of the results of the meetings with duty holders is input. Steve Murray of OSD 4.2 will also be tracking this work.

8. Action will also be taken to raise this issue centrally with UK industry via UKOOA, Pipeline Users Group (PLUG), HILF and the Marine Safety Forum.

FURTHER INFORMATION

Further information on this issue can be obtained from Steve Walker, OSD 4 or Steve Wing HID SI.

APPENDIX 1

LETTER TO OFFSHORE DUTY HOLDERS

RISER PROTECTION

HSE has been assisting the Indian Government in their investigation of the fire at the Mumbai High North offshore production complex on 27 July 2005, when 22 workers died.

The emerging findings of that inquiry emphasise the potentially disastrous consequences of pipeline riser failure, and the need to protect risers from damage from vessel collision. They reinforce the need for:

- Thorough risk assessment of the potential causes and consequences of riser damage, and the development, implementation and maintenance of associated risk management measures:
- The adoption of collision avoidance and protection measures which at least meet current good practice as described in UKOOA “Guidelines for Ship/Installation Collision Avoidance”.
- Management arrangements to ensure that the risk management measures are effective and observed in practice.

In the light of this, I am writing to ask you to review the riser integrity/protection standards and procedures on your production installation, especially if you have risers which are not installed well within the protection of a platform jacket or similar. You should undertake a formal reassessment of the risk and of the adequacy of your existing controls - both hardware and systems - relating to collision avoidance and riser integrity/protection, and identify and implement any improvement necessary. If appropriate, you should involve your pipeline operator. The annex to this letter identifies issues you should particularly cover, as well as giving further background on the Mumbai High North incident.

Later this year, HSE inspectors intend to discuss the results of such reassessments with each offshore duty holder in order to ensure that there is a very low risk of an incident similar to that in Mumbai occurring in UK waters. I will be contacting you in due course to set up such a meeting, but if you require any further information in the meantime please don’t hesitate to contact me.

Yours etc

Enc: Annex

ANNEX

Issues for particular attention during reassessment

1. Key issues for particular reference during the risk review are:

- The controls of vessels approaching the platform:
- The positioning of risers in relation to the platform structure:
- The vulnerability to damage (even risers inside the jacket structure may be at risk):
- The proximity of risers to loading zones:
- The appropriateness of fendering in relation to the design of attending vessels:
- The ability of protective fendering to resist foreseeable impacts:
- The inventory which is likely to be discharged if the riser fails below its ESDV.

Background to incident

2. The Mumbai High North (MHN) complex consisted of four bridge-linked platforms, approx 100 kms offshore. The complex imported well fluids from normally unattended satellite wellhead platforms, exported oil to shore, and supplied gas for gas lift operations on the satellite platforms.

3. The fire occurred when a multi-purpose support vessel (MSV) hit one of the risers on the outside of the MHN platform, one of the two processing platforms. The MSV had come alongside MHN to transfer an injured person to the platform via personnel basket. The vessel was large, being longer than the platform itself, and at the time was experiencing problems with one of the azimuth thrusters - it was therefore under manual control during the approach. At some stage the helideck on the vessel struck one or more of the risers.

4. The risers of the platform (export gas lift and well fluid import) were situated outside the jacket, adjacent to the boat landing stage at spider deck level. Riser protection guards were fitted just above sea level, but these were only designed for smaller offshore supply vessels (OSVs), not significantly larger MSVs.

5. It is thought that at least one of the export gas lift lines was initially severed, and the resulting leak ignited very quickly afterwards. Because of the close proximity of the various risers, and their lack of fire protection, riser failure spread. Although ESDVs were located at either end of the risers, the location of the damage meant that the whole contents of the subsea riser pipework, in some cases 12 km long, would have uncontrollably vented.

6. The resulting fire engulfed MHN and adjoining downwind platforms. After just over two hours the MHN structure completely collapsed into the sea. The speed, extent and intensity of the fire very significantly affected rescue.

7. Further details are awaiting the publication of the Indian Government report.

Implications for UK offshore platforms

8. Pipeline standards and codes are generally in agreement in recommending the fitting or routing of risers inside the jacket structure where practicable, the use of fenders to offer protection for exposed risers, and the location of risers away from loading zones. In addition, UKOOA's "Guidelines for Ship/Installation Collision Avoidance", Issue 1, December 2002 provides guidance on ship/installation collision avoidance and the potential consequences of collision.

9. The pipeline design and protective measures highlighted in paragraph 8 typically reflect best practice adopted in the UK. However, compliance with these recommendations is not mandatory and UK operators can adopt other approaches, so long as they achieve and maintain a comparable level of safety. Suitable demonstration of this should be provided in either the duty holder's offshore installation safety case and/or pipeline operator's Major Accident Prevention Document (MAPD), confirming that all major accident hazards associated with pipeline risers have been identified with suitable and sufficient design and control measures implemented.