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| <b>Incident Title</b>   |  | <b>Support Vessel Collision With Platform</b>   |  |
| <b>Incident Type</b>  |  | Explosion and Fire  |  |
| <b>Date</b>   |  | 27 <sup>th</sup> July 2005  |  |
| <b>Country</b>  |  | India   |  |
| <b>Location</b>   |  | Mumbai High North oilfield (Arabian Sea)  |  |
| <b>Fatalities</b>   |  | <b>Injuries</b>   |  |
| 22  |  | ?   |  |
|   |  | <b>Cost</b>   |  |
|   |  | \$518 m (2018) – Ref. 3   |  |
| <b>Incident Description</b>   |  | <p>A multi-purpose support vessel (MSV) was carrying out a medical evacuation of an injured crewmember to the Mumbai High North production platform (helicopters had been grounded due to monsoon conditions). The platform Offshore Installation Manager (OIM) agreed the injured person could be transferred in a basket via a cargo loading crane. The MSV had problems with its computer-assisted dynamic positioning system so it was brought in stern-first under manual control. During this operation, the MSV experienced a strong heave and its helideck struck one or more of the export gas-lift risers, causing a high-pressure release. An explosion and intense fire followed. The fire escalated rapidly, and the platform was abandoned. Within 2 hours, the production platform had collapsed into the sea. Adjacent platforms were severely damaged by heat radiation; the MSV also caught fire. After fires on the MSV had been extinguished, it was towed offsite and abandoned. Six divers in saturation chambers on the MSV were left behind but were rescued 36 hrs later. The MSV sank soon afterwards.</p>  |  |
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| <b>Incident Analysis</b>  |  | <p><b>Basic cause</b> was collision of the MSV with the production platform, resulting in rupture of one or more export gas risers.</p> <p><b>Critical factors</b> included: 1) Risers and platform cargo loading zones were located on prevailing weather side of platform, 2) Risers were located outside the jacket, 3) Riser collision protection guards were only designed for smaller offshore supply vessels (not large MSVs), 4) Risers had no fire protection, 5) Alternative medical evacuation methods were not available (helicopters grounded, leeward cargo loading crane unavailable for basket transfer, etc.), 6) MSV's dynamic positioning system malfunctioned.</p> <p><b>Root causes</b> included: 1) Inadequate design (riser location on prevailing weather side of platform and close to cargo off/loading crane), 2) Failure to apply inherently safer design (ISD) principles (locate risers within jacket or J tube/caisson-type protective sleeves), 3) Inadequate procedures (ship/platform collision risk management), 4) Impaired judgement (MSV captain and platform OIM were under extreme pressure to undertake medical evacuation as all other options were exhausted).</p> |  |
| <b>Lessons Learned</b>  |  | <p>1) India set up regulatory body to provide oversight of offshore oil and gas production, 2) Risers are safety-critical elements (due to high inventory) and should be subjected to independent risk assessment, 3) Risers may require subsea isolation valves (SSIVs) to limit the consequences any riser damage below topsides emergency shutdown valves (ESDVs), 4) Riser fire protection should include fire-resistant insulation and deluge systems, 5) Risers should be protected against collision, 6) Risers should be located away from platform cargo loading zones, 7) Minimum separation between production and accommodation platforms should be determined by fire and explosion modelling, 8) Hyperbaric evacuation points should be provided for divers.</p>  |  |
| <b>More Information</b>   |  | <p>1) "Mumbai High North Platform Disaster", J. Daley (2013),<br/>                 2) "Guidelines for Ship/Installation Collision Avoidance", United Kingdom Offshore Operators Association (2010),<br/>                 3) "The 100 Largest Losses 1978 - 2017", Marsh Property Risk Consulting Practice, 25th Edition (2018).</p>   |  |
| <b>Industry Sector</b>  |  | <b>Process Type</b>   |  |
| Oil & Gas   |  | Offshore Production Platform  |  |
| <b>Equipment Category</b>   |  | <b>Equipment Class</b>  |  |
| Mechanical  |  | Pipe  |  |
|   |  | <b>Incident Type</b>  |  |
|   |  | Explosion & Fire  |  |
|   |  | <b>Equipment Type</b>   |  |
|   |  | Gas-lift Riser  |  |