

Facility	Indian Oil Corporation's Terminal at Sanganer in Jaipur
Date	29 th October 2009
Consequences	11 workers dead
Description of accident	<p><i>Description of facility</i></p> <p>The Indian Oil Corporation's POL (Petroleum Oil Lubricants) Terminal at Sanganer in Jaipur had been in operation for 12 years prior to the accident. The facility spread over about 120 acres and comprised 9 storage tanks for petroleum products and 2 storage tanks for Motor Spirits. The terminal received products from the Koyali Refinery via the cross country pipeline and also supplied petroleum products to the neighbouring terminals of other oil companies. The IOC crude oil pipeline which runs to 2 other major refineries also passes through the IOC Jaipur terminal which therefore accommodated the critical crude pumping stations to these refineries.</p> <p>The plot of land on which it is located was originally selected as it was far away from residential localities and industrial activities. However, a large industrial area was subsequently developed all around the facility.</p> <p><i>Description of accident</i></p> <p>During the evening shift of 29 Oct 2009, the Terminal was preparing to carry out a routine transfer of Motor Spirit (MS) to the neighbouring Terminal (BPCL). 4 employees were supposed to be on the shift and the operating crew started to prepare the MS tank (tank 401-A) for pumping to BPCL terminal.</p> <p>At about 6.10 pm, while preparing the MS tank for the transfer, a huge leak occurred from the 'Hammer Blind Valve'. The liquid MS rapidly generated vapours which made the operator loose consciousness. The shift officer tried to help the operator but was also affected by the vapours and barely managed to evacuate the area. The 2nd operator, who was in the canteen and was contacted by the shift officer, rushed to the tank but also lost consciousness. The 3rd operator on the shift had earlier left for home and was not available for initiate any rescue or mitigating steps.</p> <p>With none of the operating crew being available any more for initiating any control actions, the leak remained uncontrolled and engulfed almost the entire installation. 75 minutes after the start of the leak, a huge explosion occurred followed by a fireball covering the entire installation. It is estimated that 1000 tons of MS could have escaped from the tank, potentially generating enough vapour to cause an explosion equivalent to 20 tons of TNT.</p> <p>It is possible that the ignition source which triggered the explosion and fire was one of the non flame proof electrical equipment in the Administrative Block, or a vehicle being started in the installation.</p> <p>The fire which followed the explosion spread to all other tanks and burnt for 11 days. The management of IOC took the decision to allow the petroleum products to burn out in order to avoid further possibilities of accident in the interest of public safety.</p>

	<p>All the petroleum products stored in the Terminal at the time of the accident (approx. 60,000 kL) were consumed in the fire and the installation was totally destroyed. Buildings in the immediate neighbourhood were heavily damaged with minor damages and window panes breakages occurring at up to 2 Km from the site.</p> <p>Eleven people lost their lives in the accident – six from IOC and five outsiders, and several others were injured.</p> <p>The immediate causes of the accident were the non-observance of normal safe procedure which involves a sequence of valve operations during line up activity and an engineering design which permitted use of a ‘Hammer Blind Valve’. A large area at the top of these valves can remain completely open every time the valve position has to be changed. It was through this open area that the liquid MS leaked. The root causes were the absence of site specific written operating procedures, absence of remotely operated shutdown valves and lack of understanding of hazards, risks and consequences.</p>
<p>Key Lessons Learnt</p>	<p>The key lessons learnt from the Jaipur accident are as follows:</p> <ul style="list-style-type: none"> • Facilities and installations with inherently high hazards should incorporate redundancy in safety systems and ensure their upkeep at all times • Management should ensure that reliable systems are in place to give timely feedback on the current practices and state of readiness in different facilities • Management must ensure that identified actions are being carried out • A high priority on safety from the senior and top management groups will send the right signals down the line to ensure safety and production • High degree of operational competence should be maintained at all times by building on the combined knowledge and experience of all the professional groups. The lessons learnt from all major incidents should be shared and widely disseminated in the entire Industry preferably through an appropriate website.
<p>Reports & Links</p>	<p>Independent Inquiry Committee Report on Indian Terminal Oil Fire at Jaipur on 29.10.2009. Full document available at http://oisd.nic.in/.</p>