Esteemed Readers,

The major contributor in our efforts to have "zero" incidents are the skills of the people, how they absorb technology and perform. Technology is progressively being inducted / upgraded to meet the emerging need of environment, product quality improvement, energy conservation and value addition.

In the field of further enhancing our knowledge partnerships, OISD conducted workshops on POL Terminal Operations "Maintenance and Reliability of Equipment—a Tool for Enhancing Safety" and "2nd Workshop for auditors on Mounded Storage Vessels and its Cathodic Protection System". I believe that participants, of these workshops, must have immensely benefitted out of such interaction.

52nd Steering Committee meeting was held on 6th Jan, 2017 with representatives from Oil & Gas industry (Principal Panellists) at OISD, Noida. The major areas of concern discussed during the meeting were implementation status of long pending critical ESA/ SSA recommendations, frequent shifting of expected date of completion (EDC), safety issues related to common Railway Siding and Gap Analysis w.r.t. new / revised / amended OISD Standards, Guidelines / Recommended Practices. OISD expects the industry to give due importance to the above issues since these are directly related to safety.

Various OISD Safety Standards, Guidelines and Recommended Practices are under revision. The same have been detailed in the newsletter. We expect enthusiastic contribution from the industry.

I look forward to active participation by the Industry in OISD’s mission to assist the country’s oil and gas industry in achieving the highest standards of safety.

V. Janardhana Rao
Major OISD activities Jan - June '17

External Safety Audits (ESA)

- **IOCL**
  - Panipat-Bhatinda Product pipeline was carried out during 5th - 7th Jan, 2017.
  - POL Depot at Aonla, UP was carried out during 10th - 12th Jan 2017.
  - LPG Bottling Plant at Shahjahanpur, UP was carried out during 16th - 18th Jan 2017.
  - POL Depot at Mohanapura, Rajasthan was carried out during 19th - 21st Jan 2017.
  - Koyal-Viramgam-Sidhpur section of KSPL Product pipeline was carried out during 30th Jan - 1st Feb, 2017.
  - LPG Bottling Plant at Belgaum, Karnataka was carried out during 30th Jan - 2nd Feb 2017.
  - Sangeri-Panipat section of MPPL crude pipeline, Chaksu-Panipat section of SMPL crude pipeline & Panipat Rewari product pipeline was carried out during 13th - 16th Feb, 2017.
  - LPG Bottling Plant at Guwahati, Assam was carried out during 20th - 23rd Feb 2017.
  - Bongaigaon Refinery was carried out during 27th Feb - 03rd March, 2017.
  - LPG Bottling Plant at Jammu, J&K was carried out during 28th Feb - 2nd Mar 2017.
  - Panipat Naptha Cracker Complex was carried out during 6th - 10th March, 2017.
  - Panipat Petrochemical Marketing Complex was carried out on 8th March, 2017.
  - LPG Bottling Plant at Durgapur, West Bengal was carried out during 27th - 29th Mar 2017.
  - Churwa-Beawar section of MPPL crude pipeline was carried out during 27th - 31st March, 2017.
  - LPG Bottling Plant at Muzaffarpur, Bihar was carried out during 10th - 12th Apr 2017.
  - LPG Bottling Plant at Kimin, Arunachal Pradesh was carried out during 15th - 17th May 2017.
  - Chennai-Bengaluru product pipeline & Chennai ATF pipeline was carried out during 21st - 24th May, 2017.
  - LPG Bottling Plant at Hazira, Gujarat was carried out during 29th - 31st May 2017.
  - POL Depot at Ambala, Haryana was carried out during 22nd - 24th June 2017.
  - Panipat - Ambala - Jalandhar section & Kurukshetra-

Roorkee-Najibabad section of Mathura-Jalandhar product pipeline was carried out during 26th - 29th June, 2017.

- **HPCL**
  - LPG Bottling Plant at Hazaribag, Jharkhand was carried out during 09th - 11th Jan 2017.
  - LPG Bottling Plant at Mangalore, Karnataka was carried out during 16th - 18th Jan 2017.
  - Vizag-Vijaywada Product Pipeline + Vijaywada-Secunderabad Product Pipeline was carried out during 21st - 25th Feb, 2017.
  - POL Depot at Mandir Hasaud, Chhattisgarh was carried out during 11th - 13th Apr 2017.
  - POL Depot at Vijayawada, Andhra Pradesh was carried out during 17th - 20th May 2017.
  - POL Depot at Jalandhar, Punjab was carried out during 18th - 20th May 2017.
  - POL Depot at Bokaro, Jharkhand was carried out during 24th - 26th May 2017.
  - LPG Bottling Plant at Hazira, Gujarat was carried out during 25th - 27th May 2017.
  - LPG Bottling Plant at Chakan, Pune was carried out during 05th - 08th June 2017.

- **BPCL**
  - POL Depot at Muzaffarpur, Bihar was carried out during 09th - 11th Jan 2017.
  - LPG Bottling Plant at Mangalore, Karnataka was carried out during 12th - 14th Jan 2017.
  - POL Lube Depot at Wadilube, Mumbai was carried out during 16th - 18th Jan 2017.
  - POL terminal at Jobner, Rajasthan was carried out during 16th - 18th Jan 2017.
  - Numaligarh Refinery was carried out during 20th - 24th Feb, 2017.
  - LPG Bottling Plant at Udaipur, Rajasthan was carried out during 21st - 23rd Feb 2017.
  - LPG Bottling Plant at Bareilly, UP was carried out during 17th - 19th Apr 2017.
  - POL Depot at Jalandhar, Punjab was carried out during 22nd - 24th May 2017.
  - POL Depot at Hisar, Haryana was carried out during 08th - 10th June 2017.
  - LPG Bottling Plant at Harihara, Gujarat was carried out during 26th - 28th June 2017.
- GAIL
  - Tatipaka-Kondapalli + Tatipaka-Kakinada gas pipeline was carried out during 28th-31st March, 2017
  - 18” HVJ (Vijapur-Boreri-Anta-Gadepan), VKPL-1 (Vijapur-Boreri-Gadepan), VKPL-II (Vijapur-Boreri) were carried out during 21st - 24th June, 2017

- ONGC
  - Offshore installation, BPA production process complex, Mumbai, was carried out during 9th -13th Jan, 2017
  - Offshore installation, Jack-up Drilling Rig Sagar Jyoti and Vivekanand-2, Mumbai, was carried out during 13th -16th Feb, 2017
  - Offshore installation, SH Production Process Complex, Mumbai, was carried out during 20th -24th Feb, 2017
  - Offshore installation, Jack-up Drilling Rig Paragon M-1161 and GD - Chaaru, Mumbai, was carried out during 6th -9th Mar, 2017
  - Offshore installation, MNW Production Process Complex, Mumbai, was carried out during 20th -24th Mar, 2017
  - Onshore installation, Karaikal, was carried out during 17th-21st Apr, 2017
  - Onshore installation, Tripura Asset Agartala, was carried out during 22nd -25th May, 2017
  - Onshore installation, Ankleshwar, was carried out during 5th -10th June, 2017

- OIL INDIA LTD
  - Onshore installation, Duliajan, was carried out during 17th-21st Apr, 2017 and 15th-19th May, 2017

- JTI
  - Onshore installation, JTI Ahmedabad, was carried out during 20th -23rd June, 2017

- ISRPL
  - Indian Synthetic Rubber Private Limited, Panipat was carried out during 30th-31st March, 2017.

**Pre-commissioning Safety Audits (PCSA)**

- IOCL
  - FPU (feed preparation unit) at Haldia Refinery was carried out on 21st Jan, 2017.
  - IndadeptG at Guwahati Refinery was carried out during 19th -20th Jan, 2017.
  - Mounded storage vessels (2 x 1200 MT) of LPG Bottling Plant at Belgaum, Karnataka was carried out on 30th Jan 2017.

  - Pumping facilities at Kandla for VKPL was carried on 17th Feb, 2017
  - Abu Road - Rajola section under SMPL DBL Project was carried out during 8th - 9th March, 2017
  - Pumping facilities at Balasore, Odisha was carried out on 18th March, 2017
  - Mounded storage vessels (2 x 600 MT) at LPG Bottling Plant at Chakan, Maharashtra was carried out on 20th Mar 2017.
  - Sidhpur - Abu Road section under SMPL DBL Project was carried out on 10th April, 2017
  - Viramgam MLPU’s under SMPL DBL project was carried out on 12th May, 2017
  - Jharsuguda-Khunti mainline section & Khunti station under PRRPL Project was carried out during 16th -17th June, 2017.

- HPCL
  - EURO-IV HSD optimization project of DHT unit at Visakh Refinery was carried out during 30th -31st Jan, 2017.
  - Additional facilities (Tank Lorry Filling gantry) of POL Depot at Gulbarga, Karnataka was carried out during 15th Mar 2017.
  - 1 x 2000 KL IFRVT of POL Depot at Hubli, Karnataka was carried out during 17th Mar 2017.
  - Additional facilities of 6 bays unloading gantry of POL Depot at Jalandhar, Punjab was carried out during 24th Mar 2017.
  - Tank truck loading gantry (8 plus 8 bays) of POL Depot at Pune, Maharashtra was carried out during 12th May 2017.
  - SRU TGTU and Steam Turbine Generator at Mumbai Refinery was carried out during 18th -19th May, 2017.
  - 8 bays loading/unloading TT gantry and allied facilities of POL Depot at Nalagarh, Himachal Pradesh was carried out during 09th June 2017.

- BPCL
  - Additional facilities (Extension of 2 bays) in existing 8 bays tank lorry filling gantry of POL Depot at Muzaffarpur, Bihar was carried out during 11th Jan 2017.
  - VGO-HDT, ARU, SWS & SRU at Kochi Refinery was carried out during 12th -13th Jan, 2017.
  - Delayed Coker unit at Kochi Refinery was carried out on 27th March, 2017.
  - DHT and associated facilities at Mumbai Refinery was carried out during 30th - 31st March, 2017.
• Additional facilities (extension of 2 bays) in existing 6 bays tank lorry filling gantry of POL Depot at Ongole, Andhra Pradesh was carried out during 15th May 2017.
• PFCCU NHT-ISOM at Kochi Refinery was carried out during 9th-10th June, 2017.

**CPCL**
• MS tank (Tank 626, 11786.585 KL) at Manali Refinery was carried out on 18th Feb, 2017.
• OHCU revamp project at Manali Refinery was carried out during 27th-28th Feb, 2017.
• Delayed Coker unit at Manali Refinery was carried out during 28th-29th March, 2017.

**RGPL**
• Dahej to Tapoff point under Dahej-Nagothane Ethane Pipeline Project was carried out during 18th - 19th Jan, 2017.
• Tapoff Point to Hazira under Dahej-Nagothane Ethane Pipeline Project was carried out during 19th - 20th April, 2017.

**HMEL**
• VGO-DHT & ARU/SWS Unit at Bhatinda Refinery was carried out during 20th-21st June, 2017.

**Surprise Safety Audits (SSA)**

**IOCL**
• POL Terminal at Patna, Bihar was carried out during 12th Jan 2017.
• Gujarat Refinery was carried out during 18th - 20th Jan, 2017.
• LPG Bottling Plant at Sarpura, Assam was carried out during 23rd Jan 2017.
• POL Depot at Gualborg, Karnataka was carried out during 16th Mar 2017.
• LPG Bottling Plant at Pune, Maharashtra was carried out during 09th June 2017.

**HPCL**
• POL Depot at Aonla, UP was carried out during 13th Jan 2017.
• LPG Bottling Plant at Jammu, J&K was carried out during 03rd Feb 2017.
• POL Depot at Gualborg, Karnataka was carried out during 15th Mar 2017.
• POL Depot at Hisar, Haryana was carried out during 09th June 2017.

**BPCL**
• POL Depot at Aonla, UP was carried out during 14th Jan 2017.
• LPG Bottling Plant at Patna, Bihar was carried out during 13th Apr 2017.

**HLPL**
• LNG HAZIRA was carried out during 23rd - 24th March, 2017.

**Consents to operate accorded to:**
• ONGC for Offshore production installation - Tapti (TPP - TCPP) process complex on 15th March, 2017
• BPCL Kochi for SPM on 3rd April, 2017
• ONGC for unmanned Wellhead Platform C-23 on 10th Apr, 2017
• ONGC for unmanned Wellhead Platform B-55-5 on 10th Apr, 2017
• ONGC for MODU ( Floater) Rig 'Aban-Ice' on 2nd May, 2017
• ONGC for unmanned Wellhead Platform RS-18, 20, 21 (3 Nos.) on 5th May, 2017
• ONGC for MODU (Semi-submersible) Rig 'Essar - WildCat' on 25th May, 2017
• IOCCL Vadinar for SPM-1 & 2, on 29th June, 2017
• ONGC for unmanned Wellhead Platform BD & N-23 (2 Nos.) on 30th June, 2017

**Meetings**
• ED and Dir (PL) attended meeting of Standing Committee on Petroleum & Natural Gas on Pipeline Infrastructure of Oil PSUs at Parliament House on 25th Jan, 2017.
• Director (MO-POL) attended meeting with industry members on "Minimum foam requirement for centralised foam system at POL locations and issues related to common railway siding" on 9th May, 2017.
• ED, Dir (PL), Addl. Dir (MO-POL) attended meeting of Parliamentary Standing Committee at Shimla during 17th-18th May, 2017.
• ED, Addl. Dir (PL) attended meeting at Shastri Bhawan on 8th June, 2017 regarding shifting of CBP pipeline of M/s GECEL from ROW of NHAI for highway expansion chaired by Secretary, MoPNG.

**Knowledge sharing by OISD Officials**
• Sh. Ranjan Mehrotra, Director (MO) was invited to present paper on "Contribution of Oil Industry Safety Directorate in development of standards for Indian LPG industry" at WLPGA 2017 Asia LPG Summit on 6th Feb 2017.
• Marketing Operations (POL) organized one day Workshop on 'POL Terminal Operations' at OISD, Noida on 3rd March, 2017 - attended by HSE/Maintenance officers from OMCs.
• Marketing Operations (LPG) organized 2nd one day joint workshop at OISD, Noida and IOCL LPG Bottling Plant, Madanpurkhadar, New Delhi on "Mounded Storage Vessels and its Cathodic Protection System" on 17th March, 2017.
• Director (E&P) participated at the Well Control Conference 2017 conducted by Crisis Management Team of ONGC at Vishakhapatnam on 17th - 18th March, 2017 and made a presentation on Oil spill response and readiness.
• One day training on 'Hazop Study for auditors' was imparted by former ED-OISD Sh. SL Chakravorty on 23rd March, 2017 at OISD Office, Noida.
• ED, OISD delivered an invited talk on 'Safety & Reliability in the Hydrocarbon industry - Challenges ahead' at a workshop on Reliability Enhancement organised by IOCL at IIPM, Gurgaon on 27th March, 2017.
• Director (Pipeline) participated in technical seminar on 'Industry outlook on Cathodic Protection' at Gail, Noida on 5th June, 2017.
• Marketing Operations (POL) organized two Day Workshop on "Maintenance and Reliability of Equipment-a Tool for Enhancing Safety" at Indore on 15th-16th June, 2017.
• Director (E&P) participated in the Second IADC- HPHT workshop held at Rajahmundry on 24th June 2017

Functional Committee Meetings on Safety Standards:
• Functional Committee meetings (3 Nos.) on new OISD-RP-243 on 'Recommended practices on CBM operations' were organised at OISD during Feb-Jun, 2017.
• Functional Committee meeting on revision of OISD-RP-157 on "Transportation of Bulk Petroleum Products" was organised at OISD during 7th Feb, 2017.
• Functional Committee meeting on revision of OISD-RP-167 on "POL Tank Lorry design & safety" was organised at OISD during 8th Feb, 2017.
• Functional Committee meetings (2 Nos.) on revision of OISD-GDN-180 on "Lightning Protection" were organised at OISD during March-June, 2017.
• Functional Committee meeting on revision of OISD-RP-110 on "Lightning Protection" were organised at OISD on 10th March, 2017.
• Revision of OISD-STD-191 on "Oil fielded explosive safety" was organised at OISD on 18th May, 2017.
• Functional Committee meeting on revision of OISD-STD-160 on "Protection to fittings mounted on existing LPG tank trucks" was organised at OISD during 22nd-23rd May, 2017.
• Functional Committee meeting on revision of OISD-STD-159 on "LPG Tank Trucks - Requirements of Safety on Design/Fabrication and Fittings" was organised at OISD during 22nd-23rd May, 2017.
• Functional Committee meeting on revision of OISD-STD-151 on "Safety in Design, Fabrication and Fittings: Propane Tank Trucks" was organised at OISD during 22nd-23rd May, 2017.
SAFETY ALERT
Fatality at Onshore Drilling Rig

1. Introduction
A Major accident took place at a Drilling Rig during pulling out operation. During pulling out, while cracking drill string joint, the break out line as well as safety line of break out power tong snapped and power tong hit three persons who were working on the Rig floor, and the Driller who was working on the brake. One person (Rigman) fell unconscious on the Rig floor and was declared brought dead at the hospital. The other four co-workers got minor injury in their right hand and were discharged after three days of hospitalisation.

Brief Description
A trailer mounted (Cardwell) Rig, was deployed for drilling a development well. The "L profile" well was planned with two casing policy and the first casing of 9-5/8" size (surface casing) was lowered up to 350M. The well was drilled vertically till 380m and kicked off further. The 8-1/2" diameter hole was drilled to a depth of 918m.

The activity at the time of accident was tripping out the drill string for Bottom Hole Assembly change. The shift crew was engaged in breaking open the pipe joints for stacking the stands on the rig floor. The final drill pipe joint between drill pipe and heavy weight drill pipe was being cracked open using both the power tongs. While cracking drill string joint between drill pipe and heavy weight drill pipe, the break out line as well as safety line of break out power tong snapped and power tong swung around and hit three rig crew members working on the Rig floor, and the Driller who was working on the brake.

One of the rig crew member (Rigman) fell unconscious on the Rig floor. He was immediately shifted to Civil Hospital, (Around 40km from the drill site) and was declared brought dead.

1.1 Observations
1) The power tong wire ropes were found intact at the clamp ends.
2) The break out line attached to the power tong was reported to have been changed a month back.
3) Verification of documents indicated the practice of conducting tool box meeting at the start of the shift.
4) All the crew working on the Rig floor had about a year’s experiences except for the shift in charge. The drill pipe joint resting on the slip was found not open in spite of major torque which is supposed to have contributed to jerking of the power tong lines.

5) The wire ropes were regularly sourced from DTYS where standard lengths of lines were being fabricated as per design/requirement and sent regularly to all the rigs.

Immediate cause of the incident:

The cause of the incident is the snapping of break out line as well as safety line which has resulted in violent swinging of the breakout power tong causing injuries to four persons and a fatal injury to one employee.

The snapping would have resulted in excessive torque aggravated by possible wear on wire lines due to internal corrosion and any impact/load during rig transportation and exposure to drilling mists and weather.

Analysis

1) The Driller at the brake has engaged both power tongs and heard a clicking sound. Assuming that the joint had cracked opened, the make-up tong was disengaged and in a flash an attempt was made to open the joint using rotary table with the break out tong in engaged position.

2) The reason for the accident seems to be a fatigue failure of the material of both the 19mm wire ropes almost at the middle, while both the other ends were intact and remained firmly clamped with lugs.

3) The crew did not follow SOP. While breaking the drill pipe joint with both the tongs rig floor crew should stay away from the power tong radius after ensuring that both power tongs have been engaged.

4) The rig was not having load cell which can assess the torque/pull that can be safely applied during making up of joints. Probably the load cell is used only during making up the BHA/ making up the directional drilling assembly.

Recommendations:

- Load cell to be used for applying recommended torques during connections.
- Avoid rotary table for unscrewing the joints.
- Follow SOP: After the tongs are engaged and gripping, the crew should move to safe positions.
- Wire line sizes: Standard rope sizes should be used and safety line size should be of a higher diameter than main line.
- Dismantle the wire lines attached to make up and break out cylinders during transportation.
- Wire line rolls should be stored in covered areas to avoid corrosion.
- Wire rope should be changed frequently when it is exposed to splashing of drilling mud during tripping.

General Safety awareness needs improvement in terms of criticality of operations, crew safety and third party audit safety compliances etc.
All the areas within the Battery limits shall be classified for degree and extent of hazard from flammable materials. The basis for hazardous area classification recognizes the differing degrees of probability with which flammable atmosphere may arise in the installation, in terms of the frequency of occurrence and the probable duration of existence on each occasion.

Following key factors shall be considered for proper selection of electrical apparatus and equipment for areas where flammable gas or vapour risks may arise:

- **Hazardous Area classification**, i.e. Zone 0, 1 or 2
- **Gas group classification**, i.e. gas groups IIA, IIB or IIC.
- **Temperature classification**, i.e. T-Rating.
- **Environmental protection (IP Rating)**

Hazardous areas are classified in zones based upon the frequency of the appearance and the duration of an explosive gas atmosphere as follows:

<table>
<thead>
<tr>
<th>Zone</th>
<th>Hazardous Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 0</td>
<td>An area in which an explosive atmosphere is present continuously or for long periods or frequently.</td>
</tr>
<tr>
<td>Zone 1</td>
<td>An area in which an explosive atmosphere is likely to occur in normal operation occasionally.</td>
</tr>
<tr>
<td>Zone 2</td>
<td>An area in which an explosive atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only.</td>
</tr>
</tbody>
</table>

All gases normally encountered in industry are categorized into Group-I and Group-II gases. Group-I gases are those which are found in the coal mining industry. Group-II gases have been further subdivided into three main representative subgroups namely Group - IIA, Group-IIB, and Group-IIC in the increasing order of their explosiveness.

<table>
<thead>
<tr>
<th>Zone Gas Groups</th>
<th>Typical Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-IIA</td>
<td>Acetone, ammonia, ethyl alcohol, gasoline, LPG/Propane.</td>
</tr>
<tr>
<td>Group-IIB</td>
<td>Ethylene, acetaldehyde.</td>
</tr>
<tr>
<td>Group-IIC</td>
<td>Acetylene, hydrogen.</td>
</tr>
</tbody>
</table>

The temperature class (T-Rating) defines the maximum surface temperature an electrical apparatus is allowed to operate at. The maximum surface temperature of the apparatus must always be lower than the ignition temperature of the surrounding gases or vapours mixed with air at normal pressure. Apparatus, that are certified suitable for use in a hazardous area, should be marked with their temperature class.

<table>
<thead>
<tr>
<th>Temperature Class</th>
<th>Max admissible surface temperatures on group II electrical apparatus</th>
<th>Ignition temperatures of inflammable substances in °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>450</td>
<td>&gt;450</td>
</tr>
<tr>
<td>T2</td>
<td>300</td>
<td>&gt;300 &lt; 450</td>
</tr>
<tr>
<td>T3</td>
<td>200</td>
<td>&gt;200 &lt; 300</td>
</tr>
<tr>
<td>T4</td>
<td>135</td>
<td>&gt;135 &lt; 200</td>
</tr>
<tr>
<td>T5</td>
<td>100</td>
<td>&gt;100 &lt; 135</td>
</tr>
<tr>
<td>T6</td>
<td>85</td>
<td>&gt;85 &lt; 100</td>
</tr>
</tbody>
</table>

General guidelines for type of protection for electrical equipment in hazardous areas are enumerated in Table below:

<table>
<thead>
<tr>
<th>Area Classification</th>
<th>Description</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 0</td>
<td>Intrinsic safety category 'a'</td>
<td>'l'</td>
</tr>
<tr>
<td></td>
<td>Encapsulation</td>
<td>'m', 'n'</td>
</tr>
<tr>
<td></td>
<td>Other electrical apparatus, specifically designed for Zone 0</td>
<td>'e'</td>
</tr>
<tr>
<td>Zone 0</td>
<td>Any type of protection adequate for Zone 0</td>
<td>'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z'</td>
</tr>
<tr>
<td></td>
<td>Intrinsic safety category 'b'</td>
<td>'l'</td>
</tr>
<tr>
<td></td>
<td>Flame proof enclosure</td>
<td>'d'</td>
</tr>
<tr>
<td></td>
<td>Pressurisation</td>
<td>'p', 'q', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z'</td>
</tr>
<tr>
<td></td>
<td>Powder filling</td>
<td>'q'</td>
</tr>
<tr>
<td></td>
<td>Encapsulation</td>
<td>'m', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z'</td>
</tr>
<tr>
<td>Zone 2</td>
<td>Any type of protection adequate for Zone 0 or Zone 1</td>
<td>'l'</td>
</tr>
<tr>
<td></td>
<td>Intrinsic safety category 'c'</td>
<td>'l'</td>
</tr>
<tr>
<td></td>
<td>Increased safety</td>
<td>'e'</td>
</tr>
<tr>
<td></td>
<td>Non-sparking apparatus</td>
<td>'n'</td>
</tr>
<tr>
<td></td>
<td>Pressurisation</td>
<td>'p', 'q', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z'</td>
</tr>
<tr>
<td></td>
<td>Encapsulation</td>
<td>'m', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z'</td>
</tr>
</tbody>
</table>
IP RATING CHART

Protection of persons and protection of equipment indicated by the IP code.

Protection provided by enclosures for electrical equipment is indicated by the IP codes two:

CHARACTERISTIC NUMERALS

The first numeral indicates protection of persons against access to hazardous parts, and protection of equipment against ingress of solid foreign objects.

The second numeral indicates protection of equipment against harmful ingress of water.

The "flash" symbol indicates hazardous parts (live or moving).

X Protection unspecified (untested)
0 Non-protected
1 Protection of the back of the hand against accidental access to hazardous parts, and protection of equipment against objects larger than 50mm.
2 Protection of fingers against access to hazardous parts, and protection of equipment against objects larger than 12.5mm.
3 Protection of persons holding tools or wires (larger than 2.5mm diameter), and protection of equipment against objects larger than 2.5mm (e.g. ball bearings).
4 Protection of persons holding small tools or wires (larger than 1mm diameter), and protection of equipment against objects larger than 1mm (e.g. ball bearings).
5 Protection against entry of dust in sufficient quantity to interfere with satisfactory operation of equipment.
6 Complete protection against entry of dust.
7 Protection against temporary immersion.
8 Protection against continuous submersion (tests subject to agreement, but no less severe than second numeral 7)
SAFETY ALERT

Fire & Fatality during Inter tank transfer of MS

The Incident:
- A major explosion and fire incident took place at one of the installations involving 2 fatalities and 3 injuries.
- The incident happened during Motor Spirit (MS) transfer operation from one tank to another tank using portable pump with its motor connected with non-FLP (Non-Flame Proof) electrical switch board in the dyke itself.

Sequence of Events:
- The installation was under major revamping and simultaneous operations were also in progress.
- The firefighting facilities were totally isolated and defunct and there was no approach road for movement of fire tender up to incident site.
- In these circumstances, product transfer was being carried out through water draw off line from one tank to another tank (both MS tanks) with the use of a portable pump connected with non-FLP switch board.
- The product transfer was carried out by a contractor under supervision of HSSE, Officer of the Installation. 07 contract workmen were involved in carrying out inter-
tank transfer of product. Dy. Manager - Operations and Manager - Operations were also present at the site at the time of incident.
- When the pump was not getting suction then both the manhole covers of the tank were opened to see the level of the product inside the tank keeping the motor on.
- As soon as the pump was stopped an explosion took place with a huge blast followed by fire near the manhole.
- One Officer & One contract workman died in the incident and three contractor persons were injured.

Analysis of the Incident:
- In the transfer process when tank level was below the dead stock, two side manhole covers of the MS tank were opened keeping pumping operation on. This caused accumulation of rich hydrocarbon vapour in the vicinity of MS tank in the dyke.
- When pump suction failed, it was decided to stop the transfer operation. While stopping the pump, immediately there was huge explosion followed by fire near the manhole of the tank.
- Initially, the fire started near the non-FLP switch board and subsequently travelled to manhole of motor spirit tank & further propagated inside the tank.
- The incident resulted in fatality of 02 persons (1 officer & 1 contract workman) and burn injuries to another three persons (1 officer & 2 contract workmen).

Root Cause:
- Opening of both side manhole covers of MS tank without following any laid down procedure coupled with carelessness & without opening top manhole cover for aeration. Above has caused accumulation of MS vapors in the vicinity of tank and around the motor/non FLP electrical switch board.

Non FLP switch Board -source of ignition
Due to sudden stoppage of running motor, spark generating from non-FLP switch board ignited the rich MS vapors resulted in explosion and fire.

**Major lapses leading to this incident:**

- No proper job safety analysis before commencement of hazardous jobs
- Non adherence to SOP/work permits in line with OISD Std-105 which is evident from unauthorized opening of manhole covers of MS tank without work permit
- Non issuance of electrical permit for electrical work i.e. connection from LT panel to Non-FLP switch board without considering electrical hazard applicable in zone 2.
- No MOC (Management of Change) for transfer of product through water draw-off lines of tanks.

**Recommendations:**

- Proper Job Safety Analysis covering all hazards & risks involved along with adequate mitigation measures should be carried out prior to commencement of any critical operations/jobs
- Project works being executed at operating locations should not compromise the safety infrastructure of the location
- Usage of non-FLP junction box / switch board should be strictly prohibited inside tank farm area/operating area.
- All critical activities must be supervised by a competent officers and role holders.
- Double earthing to the motors should be ensured.
- Work permit system as per OISD-STD-105 should be strictly adhered to without any lapse.
- Manhole covers should not be opened unless all associated risks have been assessed and mitigation measures taken.

- All operations should be carried out strictly as per SOP.
- Presence of hydrocarbon to be checked with the help of explosive meter prior to commencement of any critical activity.
- Unhindered access to firefighting equipment must be ensured.
- Motor-able approach road to be provided to enable free movement of fire tenders.
- Integrity of fire screen must be ensured before carrying out any hot work.
- Electrical permit shall be issued for all electrical jobs executed at the location.
- Electrical equipment should strictly conform to the Hazardous Area Classification (OISD-STD-113)
- MOC should be processed and approved by the appropriate authority before undertaking any job for which laid down procedures/SOPs are not available.
- It is apparent that lessons from the previous similar accidents have not been learnt by the officers at the locations and repeating the same mistakes which are proving to be fatal.
- Chart with history of all fatal accidents (post Jaipur, Hazira, Madurai & Tirunelveli) with root cause and no. of fatalities to be displayed at prominent places in the location for awareness.
- Based on the incident, it is evident that necessary safety training has not been imparted to the terminal staff for undertaking such critical jobs. Therefore OMCs to impart training on safety including behavioral safety to all operating people extensively.

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**Tomorrow - your reward for working safely today.**

**If you don’t think it’s safe, it probably isn’t**
Safety Audit: HPCL, Hazira - LPG Bottling Plant (25-27.05.2017)

Before

After


Before

After

Before

After

Before

After
FAREWELL

Mr. NK Venugopal is a Mechanical Engineer from Kerala University who graduated in 1979. He joined Oil India Limited in 1983 and worked in Duliajan till his transfer to Oil Rajasthan in 2010. He joined OISD on deputation in May 2014 and served here till his retirement on 30th June 2017. He contributed a great deal in ESA and DMP monitoring and formulations of new standards etc. His expertise was of great help to OISD especially in production area of E&P business.

Incoming Officers

Shri Rohit Acharya
joined OISD on 5th May, 2017 as Assistant Director (Process & Engineering). He has acquired Electrical Engineering degree from NIT, Bhopal (MP). He has 9 years' experience of Maintenance, turnaround planning & shutdown execution in HPCL.

Shri Vivek Prakash Singh
joined OISD on 4th May, 2017 as Joint Director (Process & Engineering). He has acquired Mechanical Engineering degree from REC, Rewa (MP). He has 11 years' experience of project execution, pre-commissioning / commissioning, maintenance planning & shutdown execution in Panipat Naphtha Cracker plant of IOCL.

Shri Leela Prasad Konduri
joined OISD on 20th March, 2017 as Additional Director (Pipelines). He is a Mechanical Engineer with 22 years of experience in design, engineering, construction & commissioning of cross country pipeline projects, operation & maintenance of cross country & offshore pipelines in Pipeline Division of IOCL.

Shri Harendra Yadav
joined OISD on 18th April, 2017 as Joint Director (Process & Engineering). He has acquired Chemical Engineering degree from Indian Institute of Technology, Roorkee in 1995. He has 22 years' experience of Refinery Operation, Technical Services, Project execution, Commissioning, Production planning etc in BCPL, Mumbai Refinery.
**Shri Devendra M Mahajan**

joined OISD on 4th May, 2017 as Joint Director (Process & Engineering). He has acquired Chemical Engineering degree from Laxminarayan Institute of Technology (LIT), Nagpur. He has 12 years’ experience of Unit Operation, pre-commissioning/commissioning/Shutdown management in Guwahati and Gujarat Refineries of IOCL

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**Shri Mrinal Kumar Dutta**

joined OISD on 3rd April, 2017 as Additional Director (Process & Engineering). He has acquired Chemical Engineering degree from Assam Engineering College, Guwahati (Assam). He has 24 years of rich experience in Indian Oil’s Refinery Operations, Technical Services and Marketing Operations.

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**Transferred Officers**

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**Shri RN Mittal**

was Additional Director (Pipelines) at OISD. On transfer, he joined General Manager (Internal Audit), GAIL, New Delhi.

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**Shri Rajesh Dudi**

was Dy. Director (IS) at OISD. On transfer, he joined as Manager (IS) - North Zone, HPCL, New Delhi.

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**Ms. Madhu Puri**

was Jt. Director (MO) at OISD. On transfer, she joined in Scope Corp Plng & ES, BD, IOCL, New Delhi.
NEWS IN BRIEF

Steering Committee meeting
52nd Steering Committee meeting held on 6th Jan, 2017 with representatives from Oil & Gas industry (Principal Panelists) at OISD, Noida. Some of the major points discussed during the meeting are as under:

- Adoption of New/ Revised/ Amended OISD Standards
- OISD’s ESA Plan vis-à-vis Actual for the year 2016-17 of all sectors - E&P, Ref & GPP, Pipeline and Marketing groups
- Review of implementation status of long pending critical ESA/ SSA recommendations
- Incident analysis for the last three years and review of implementation status of recommendations.
- Safety issues related to Common Railway Siding.
- Compliance status of recommendations of investigation committee reports of major incidents at IOCL Hazira Terminal fire and GAIL pipeline incident at Tatipaka.

Technical Seminar/ Conference/ Workshops
Technical Seminars/Conferences/Workshops for the Oil industry are conducted by OISD to discuss the latest technological developments, sharing of incident experience etc.

- One day workshop on 'POL Terminal Operations' at OISD, Noida on 3rd March 2017 - attended by HSE/ maintenance officers from OMCs

Inauguration of the Workshop by Executive Director, OISD

- 2nd one day "Workshop for Auditors for Mounded Storage Vessels and its CP System" at OISD, Noida and IOCL’s LPG Bottling Plant, Madanpur khadar, New Delhi on 17th Mar’2017.

Pictures of Workshop on CP protection - session taken by Sh KB Singh, Consultant

- Two day workshop on "Maintenance and Reliability of Equipment - a Tool for Enhancing Safety" at Indore on 15-16th June, 2017

Ninety three executives from HSE and field level officers (Safety/ M&R role holders) of PSUs Oil Marketing Companies and Private Operators participated in the Workshop.

Faculties and participants attending the workshop at Indore

ED-OISD presenting memento to participant in workshop at Indore
Third (3rd) International Yoga Day celebration at OISD
The 3rd International Yoga Day was celebrated on 21st June 2017 with full enthusiasm. To make the event successful, all OISDians assembled at OIDB Auditorium. The program emphasised on positive aspects of practicing Yoga & Meditation for overall health benefits.

Consolation Award for Official Language
OISD was awarded Consolation Award for Official Language Implementation from MOP&NG, Rajbhasha Department for the year 2015-16. The award function was held on 23.04.2017 at Srinagar.

World Environment Day celebration at OISD
Oil Industry Safety Directorate like all previous years celebrated the World Environment Day at its office at NOIDA. "Connecting People to Nature", was the theme for World Environment Day [WED] - 2017, which implores us to get outdoors and involves us into nature, to appreciate its beauty and its importance, and to take forward the call to protect the Earth that we share.

The programme commenced with tree plantation by ED, OISD followed by pledge taking by OISDians which was administered by Director (E&P), OISD and Director, (MO-LPG), OISD in English and Hindi respectively. Speaking on the occasion, ED, OISD, shared various thoughts and activities which connects us with nature. He emphasised to explore the fun and exciting ways to experience and cherish the vital relationship of us with nature.

Several activities were planned to commemorate the occasion. This included Quiz competition, slogan competition, poetry recitation etc.

World LPG Association (WLPGA) 2017 Asia LPG Summit
Sh. Ranjan Mehrotra, Director (MO) was invited to present paper on "Contribution of Oil Industry Safety Directorate in development of standards for Indian LPG industry" at WLPGA 2017 Asia LPG Summit on 6th Feb'2017.
CONGRATULATIONS

Ms. G.G. Aishwarya
daughter of Sh. Gopinath GM, Deputy Director (Admin) scored 1st Rank with 91% of marks in all subjects in Business Studies, 11th Standard and she was honoured by her school Billabong High International, Noida.

Master Jayant Tanwar
son of Sh. Pradeep Tanwar, Additional Director, MO-LPG, was adjudged Mr. MBSian 2016-17 by the School authorities after five rounds of competition held at Hotel Radisson Blu, Dwarka on 27th Jan, 2017. He is a student of class 12th in MBS International School, Sector 11, Dwarka.

Master Ritvik Tanwar
son of Sh. Pradeep Tanwar, Additional Director, MO-LPG, scored 1st rank in his school, 25th and 155th in the State and international level respectively, for "International English Olympiad" held in Jan, 2017. He is a student of class VIII, Sachdeva Global School, Dwarka.

Better a thousand times careful than once dead.

If you don’t think it’s safe, it probably isn’t.

Safety doesn’t happen by accident.
Demarcation for safe movement of Tank Lorries & operating personals inside loading area - a treat to watch

TT entry lane in TLF gantry

Pedestrian path way in TLF area

Main gate entry TT incoming

Main gate TT outgoing

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