

## SAFETY MEASURES ADOPTED DURING TRANSPORTATION OF LPG IN CYLINDERS AND BULK

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### Overview of Road Accidents in India

Year	Total No of Road Accidents in India	Fatality	Accident Severity (Number of persons killed in 100 accidents)
2012	490383	138258	28.2
2013	486476	137572 ↓	28.3
2014	489400	139671 ↑	28.5
2015	501423	146133 ↑	29.1
2016	480652	150785 ↑	31.4

### Key Indicator of Road Accidents in India –2016

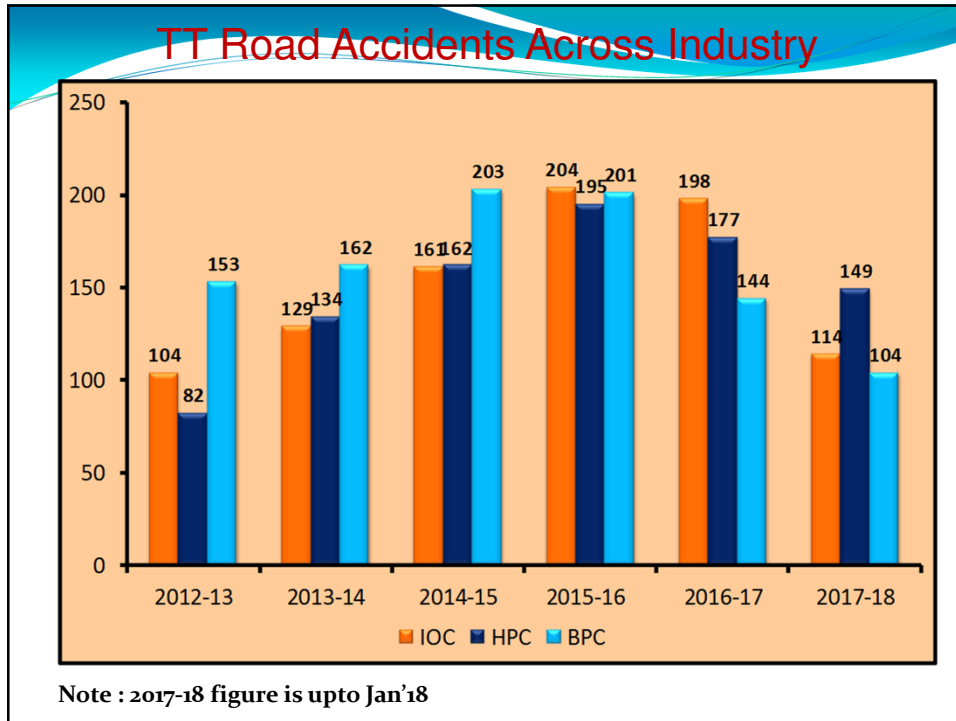
Parameter	Nos	Remark
No of Accidents	480672	Down by 4.1 %
No of Deaths	150785	Up by 3.2 %
Accident Severity	31.4 %	Up by 7.9 %
No of incidents/ Day	1317	
No of Incidents/ Hr	55	
No of Deaths/ Day	413	
No of Deaths/ Hr	17	
Person Injured	494624	

**In India, road injuries are one of the top four leading causes of death and health loss among persons of age group 15-49 years.**

### Major Contributor of Road Incidents

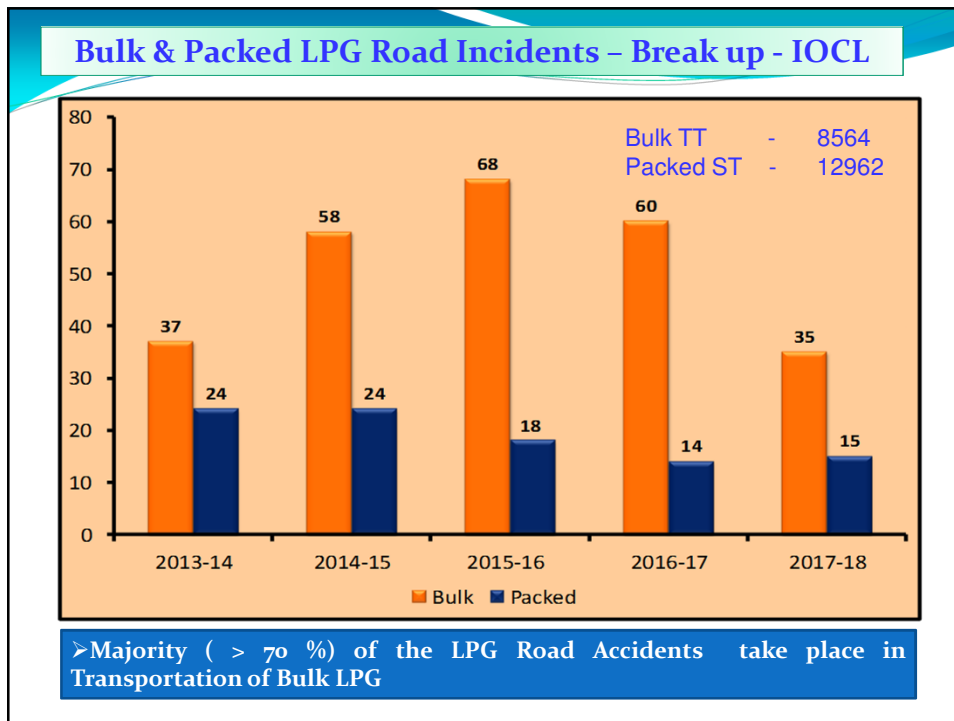
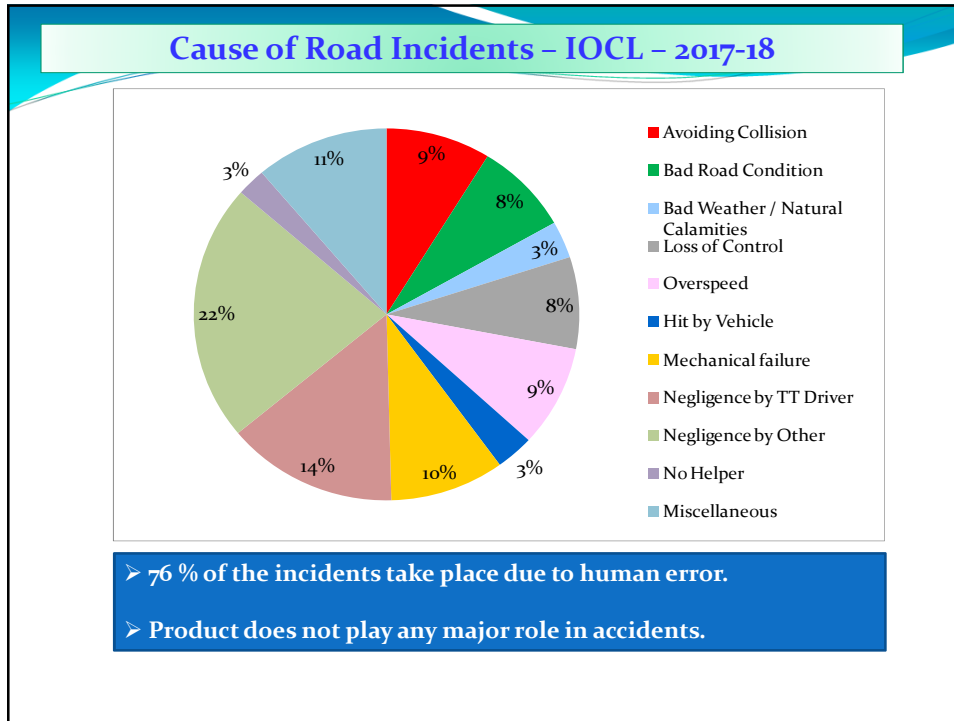
- Drivers' Fault was Main factor responsible for Road accidents.
- 84.0 % of Total Road Accidents & 80.3 % of Road Accident Deaths in 2016 took place due to Driver Fault.
- Within Drivers' Fault :

Cause	% of Accidents	% of Deaths
Overspeeding	66.5 %	61.0%
Overtaking	7.3%	7.8%
Intake of Alcohol	3.7%	5.1%
Talking over mobile	1.03 %	1.42 %



### TT Accidents - IOCL

Year	POL	LPG	Total
2009-10	61	42	103
2010-11	61	47	108
2011-12	64	34	98
2012-13	64	40	104
2013-14	68	61	129
2014-15	83	78	161
2015-16	92	71	163
2016-17	123	75	198
2017-18(Upto Feb'18)	75	50	125
<b>Total</b>	<b>691</b>	<b>498</b>	<b>1189</b>



### Causes of Accidents

- ▶▶ **Poor road condition.**
- ▶▶ **Bad weather.**
- ▶▶ **Overtaking, Over speeding, Application of sudden brake.**
- ▶▶ **Absence of approved parking place.**
- ▶▶ **Other slow moving transports.**
- ▶▶ **Human failures due to lack of training.**
- ▶▶ **Mechanical failure due to poor maintenance.**
- ▶▶ **Driving in alcoholic condition**
- ▶▶ **Using Mobile phone while driving.**
- ▶▶ **No fixed driving Hours.**
- ▶▶ **Restriction during day hours**

### Action Taken by IOCL to Minimize Accidents

Cause of accident	Root Cause analysis	Action Taken
<b>Hit by another vehicle</b>	Bad weather, Unsafe Driving	Safety Bulletins, Safe Driving Campaign
	Eye Deficiency / Defective Eye	<b>Eye Campaign / Eye Surgery</b>
<b>Over speeding</b>	<ul style="list-style-type: none"> <li>▪ Lack of Training,</li> <li>▪ Over confidence,</li> <li>▪ Influence of Alcohol,</li> </ul>	Tool Box Talk, Safe Driving Campaign, Animated Films, Introduction of ABAT (Alcohol Breath Analyzer Test) VTS Monitoring – Action against the violator
<b>Avoiding collusion</b>	<ul style="list-style-type: none"> <li>▪ Unsafe driving,</li> <li>▪ Poor eyesight</li> <li>▪ Sudden appearance of person, vehicle, animal etc.</li> </ul>	TT Crew Training, Tool Box talk <b>Eye Test Campaign</b>
<b>Loss of control</b>	<ul style="list-style-type: none"> <li>▪ Poor Tyre condition,</li> <li>▪ Use of Mobile phone while driving.</li> <li>▪ Non functioning of ABS</li> <li>▪ Influence of Alcohol</li> </ul>	Checking of TT, Training and Awareness, Checking of ABS

### Action Taken by IOCL to Minimize Accidents

Cause of accident	Root Cause analysis	Action Taken
<b>Mechanical failure</b>	<ul style="list-style-type: none"> <li>▪ Poor Maintenance of vehicle,</li> <li>▪ Bad Road condition</li> </ul>	Guidelines on check before making journey,
<b>No helper</b>	<ul style="list-style-type: none"> <li>▪ No assistance while parking, overtaking, reversing, wrong side overtake by other vehicle</li> <li>▪ Ensuring Driver does not blink</li> </ul>	Availability of Helper is ensured thru Tender condition and check while entering the location.

### Eye Check Up Campaign

Nos of the Location	No. of Drivers participated	No. of Drivers found Deficient	Cataract	Vision / Retina	Colour / Eye Blindness	Other (Infection, conjunctivitis etc)
276	29374	10460	584	3397	287	1594
Deficient Drivers %		36	2	12	1	5

### Safety Fittings on a LPG Bullet

- Safety Relief Valve
- Excess Flow Check Valve
- Roto-Gauge
- Master Cut-Off Switch.
- ABS.
- Fire Extinguishers.
- Spark Arrestor.
- Electrical Wiring / Electrical System.

### Tank Wagon Safety Fittings

- Safety Valve.
- All other fittings such as liquid valves, vapour valves, magnetic gauging device, thermo-well, sampling valve and safety valves, pressure gauges are provided on the top of the pressure vessel in a protective housing known as 'dome' with a cover.

## Transportation of LPG in cylinders

- Cage trucks are used.
- Trucks are provided with ABS and Master cut off .
- Cylinders are with shroud to protect valves.
- Spark Arrestor.
- Fire Extinguishers.
- Cylinder valves are adequately plugged.
- Cylinders are transported in vertical position.



No of ERVs	- 23	Planned- 4
No of QRVs	- 02	



## Important Acts and Rules governing Road Safety

- ▶▶ The Motor Vehicles Act of 1988 with latest amendments;
- ▶▶ The Central Motor Vehicle Rules, 1989 with latest amendments;
- ▶▶ The Petroleum Rules, 2002 with latest amendments;
- ▶▶ The Public Liability Insurance Act, 1991 with latest amendments;
- ▶▶ The SMPV Rules of 1981 (UNFIRED) with latest amendments for LPG;
- ▶▶ OISD – RP – 157 - Recommended Practice for Transportation of Bulk Petroleum Products
- ▶▶ OISD – STD – 159 LPG Tank Trucks - Requirements of Safety on Design/Fabrication and Fittings
- ▶▶ OISD –STD – 160 - Protection to fittings mounted on existing LPG tank trucks
- ▶▶ OISD- GDN – 161 - LPG Tank Truck Incidents : Rescue & Relief Operations
- ▶▶ OISD – GDN – 165 - Guidelines for Rescue & Relief Operations for POL Tank Truck Accident
- ▶▶ OISD – RP – 167 - POL Tank lorry Design & Safety





**Thanks**

**ERV DETAIL**

<b>IOCL</b>	<b>BPCL</b>	<b>HPCL</b>
Ajmer	Piyala	Bahadurgarh
Shahjahanpur	Coimbatore	Bhatinda (HMEL)
Durgapur	Uran	Mangalore
Patna	Jalgaon	Cochi
Balaosore	Pune	Vizag
North-Guwahati		Chakan
Hazira		
Raipur		

