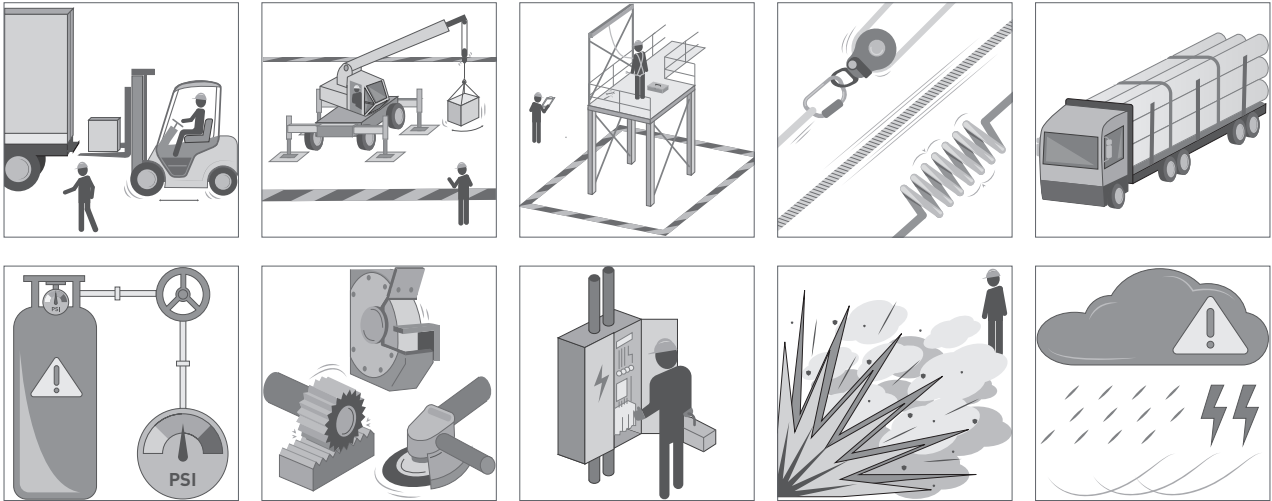


Line of Fire




Introduction


The IOGP Safety Committee's core objective is to eliminate fatal and life changing injuries. To support the successful implementation of IOGP Report 459 – *Life-Saving Rules* (LSR), a package of materials focused on Line of Fire (LoF) (Figure 1) has been developed.

Ten LoF hazard categories have been derived from the analysis of fatalities and permanent impairment injuries reported to IOGP. The materials have been created to enhance understanding and promote learning from these incidents and provide:

- Questions to help prevent people being in the wrong place at the wrong time.
- Actions to help prevent people being in the wrong place at the wrong time.



LIFE-SAVING RULES



Keep yourself and others out of the line of fire

- I position myself to avoid:
 - moving objects
 - vehicles
 - pressure releases
 - dropped objects
- I establish and obey barriers and exclusion zones
- I take action to secure loose objects and report potential dropped objects

Figure 1 – Line of Fire Life-Saving Rule

The IOGP LoF Questions and Actions can be used as part of a process such as a risk management cycle (Figure 2) to identify, assess, and effectively control LoF hazards.



Figure 2 – LoF Questions and Actions can be used within a Line of Fire risk management cycle

Work site implementation

The IOGP Life-Saving Rules are based around actions that individuals can take to protect themselves and others. The LoF materials are intended to be used by individuals to help themselves or others avoid being in the line of fire.

Context drives behaviour¹ and control measures necessary in different work sites and operating conditions may vary. Multiple LoF hazard categories may be relevant and may require specific controls to be implemented. The LoF materials are not intended to provide a fully comprehensive set of design requirements and controls for workplace line of fire hazards. These should be the responsibility of the organization that manages the work site and be prioritized based on the hierarchy of controls, (see Figure 3).

¹ IOGP Human Performance Principles, <https://www.iogp.org/workstreams/safety/safety/human-performance>

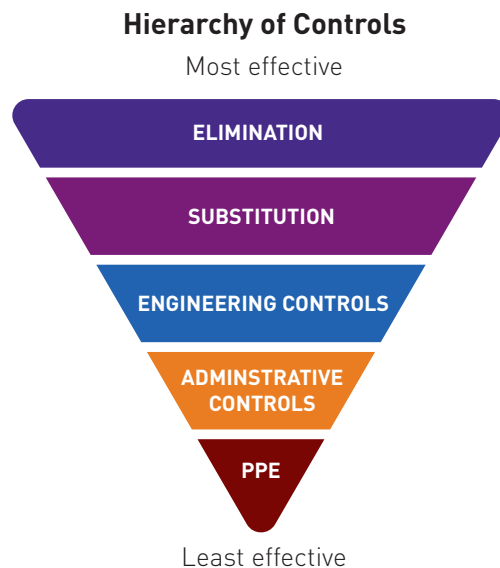


Figure 3 – Hierarchy of Controls

The LoF materials have been developed to provide guidance in the form of questions and actions for front line workers, designers, risk assessors, and managers. The 10 LoF hazard categories are illustrated with a graphic, and explained through bullet points, to represent common causes of LoF actual FPI injuries. The materials include:

- an infographic
- a presentation pack
- prompt cards for workplace use

The LoF hazard prevention questions and actions can be used to:

- Raise workforce awareness to improve understanding of workplace LoF hazards.
- Promote worker engagement, e.g., by encouraging conversations around relevant hazard categories and how to avoid being in the LoF.
- Check control measures are effectively implemented (verification and validation).
- Provide reminders to improve the workplace, work equipment, task design, and planning processes, to avoid LoF hazards.

Note: although not specifically stated in the infographic for each hazard category, for operational activities, personnel should always be trained and competent to perform their assigned tasks in addition to the implementation of the Life-Saving Rules.

Suggested uses for the materials include:

- visuals for toolbox talks
- start of work conversations
- worksite awareness campaigns
- discuss a different topic every day/month/week
- hazard hunts/risk identification

Background

The 10 LoF hazard categories presented are based on analysis of Fatality and Permanent Impairment (FPI) incidents where LoF has been assigned as a primary or secondary LSR.

Definitions:

Permanent impairment

Permanent impairment is defined as the outcome of a work-related injury from which the worker cannot or is not expected to return to their previous (pre-incident) whole person function as a result of an acute, single incident.

Reference <https://iogp.org/fpi>.

High potential event (HiPo)

IOGP defines a high potential event as an event which could have, under slightly different circumstances, realistically resulted in a fatal incident.

Incident vs. injury

An injury is a specific outcome to an individual person as a result of an acute single incident. An incident may encompass one or more injury outcomes (fatality or injury).

Control

An item or system designed to reduce safety risk. The term 'control' is intended to include safeguards, barriers, or other equivalent terminology.

Barrier (from IOGP Report 510 – *Operating Management System Framework for controlling risk and delivering high performance in the oil and gas industry*)

A risk control that seeks to prevent unintended events from occurring, or prevent escalation of events into incidents with harmful consequences.

Data Analysis – Life-Saving Rules

Figure 4 shows the primary LSR allocated to fatal incidents reported to IOGP between 2000 and 2024, and that LoF is the LSR that was most frequently allocated.

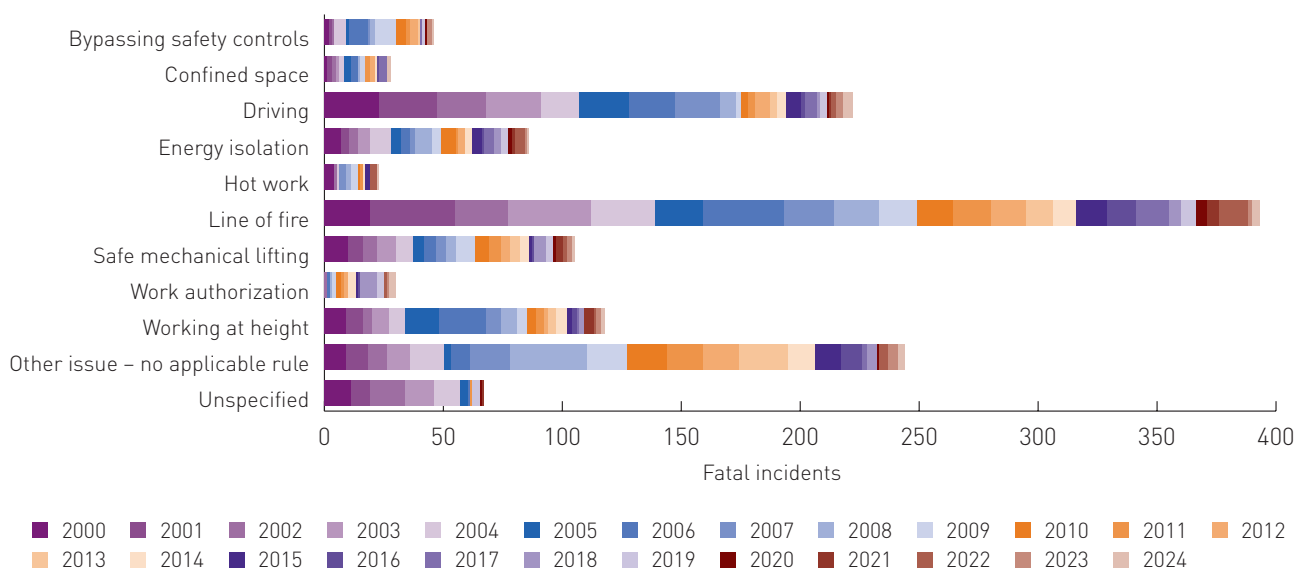


Figure 4 – IOGP Life-Saving Rules allocated to fatal incidents (2000-2024)

IOGP has been collecting permanent impairment injury data since 2022. Data analysis is presented at <https://data.iogp.org/>. Figure 5 shows the primary LSR assigned to permanent impairment (PI) incidents reported to IOGP between 2022 and 2024.

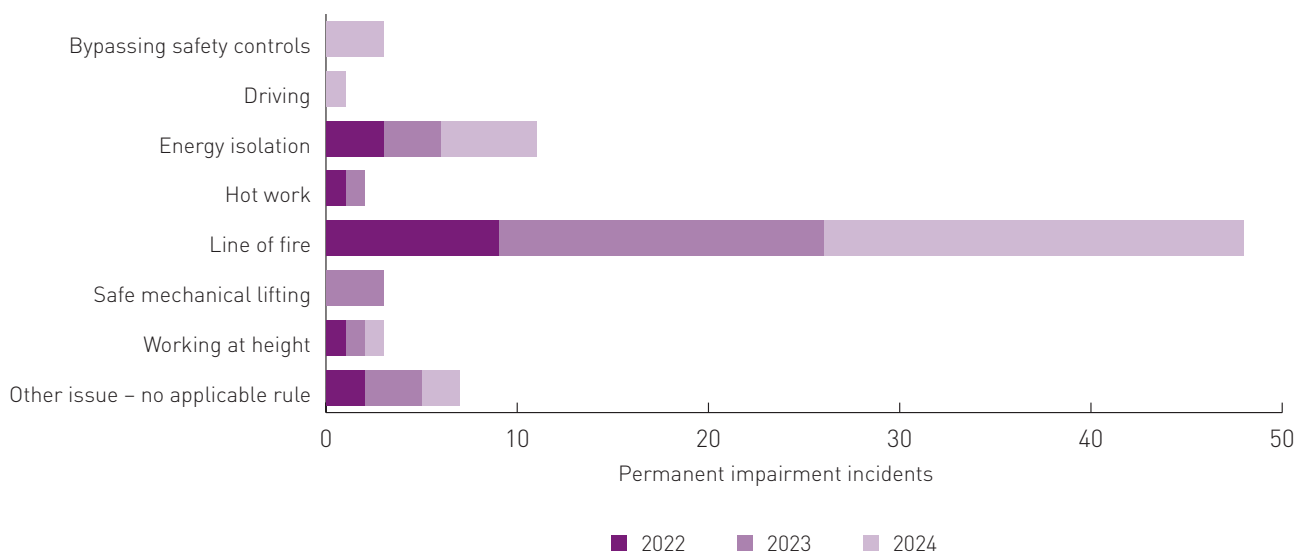


Figure 5 – IOGP Life-Saving Rules allocated to permanent impairment incidents (2022-2024)

Data Analysis – Line of Fire

Further analysis of the fatality and permanent impairment (FPI) data helped to identify the 10 LoF hazard categories, and the associated Questions and Actions.

The data shows that the difference between a high potential event outcome (an event where, under different circumstances, there could have been a fatality) and a fatal incident is often dependent on where people are positioned in relation to the surrounding hazards. LoF hazards are not always obvious or constant and can be introduced as a task progresses.

Both primary and secondary LSR have been allocated to fatal and PI incidents reported to IOGP. The primary LSR associated with an FPI injury is the LSR that, if followed, might have prevented the incident, and has the most specific learning. The primary LSR may be LoF or another LSR. In many cases, more than one LSR apply, and in these cases, a secondary LSR has also been assigned.

Analysis of fatality and PI data reported to IOGP highlights that 36% of fatalities and 80% of PI injuries were assigned a primary or secondary LSR. A further 6% of fatalities and 4% of PI injuries were assigned a different primary or secondary LSR but were identified as having a causal factor of LoF. See Table 1, and Figures 6 and 7.

Table 1 – FPI incidents and injuries by IOGP LoF hazard category

LoF hazard category	2000-2024		2022-2024	
	Fatalities	Fatal incidents	PI injuries	PI incidents
Electrical equipment/exposure	68	65	2	2
Machinery & tools	42	41	20	20
Mechanical lifting/hoisting	71	71	4	4
Moving vehicles/mobile equipment	142	142	1	1
Natural environmental events/ extreme weather	3	3	0	0
Objects with uncontrolled roll, slide, or fall potential	89	88	12	12
Pressurized or vacuum systems/ equipment	56	47	9	9
Projectiles/explosion/jet fire	34	31	4	3
Tensioned lines/spring loaded devices/stored energy	31	31	9	9
Working at height (falls and dropped objects)	94	92	5	5
Not applicable	1	1	0	0
Total	631	612	66	65

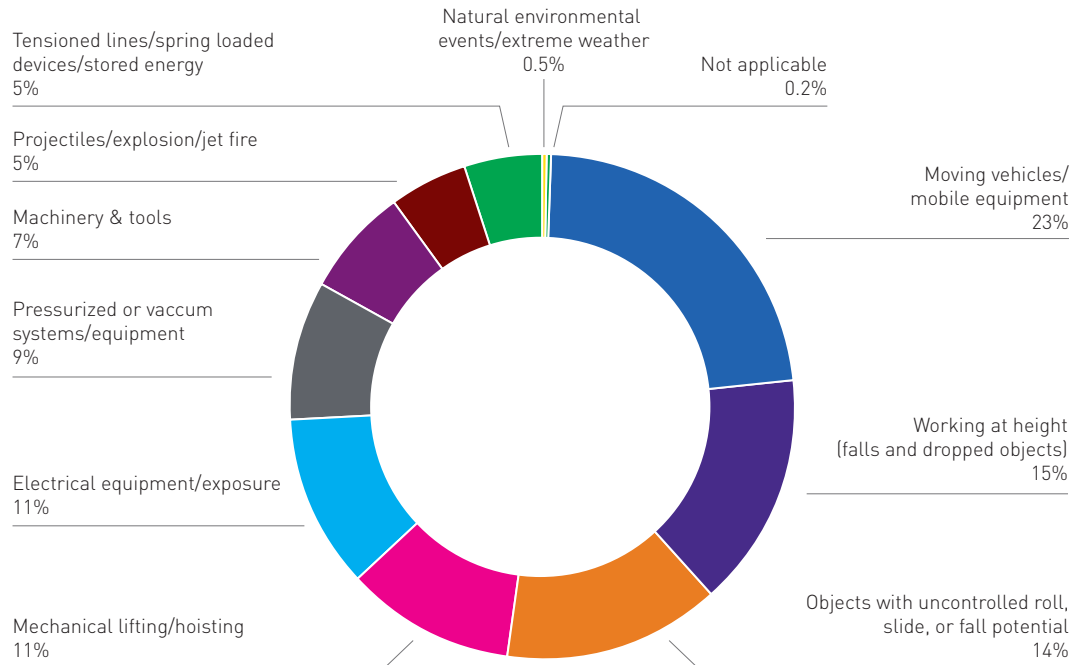


Figure 6 – Line of Fire fatalities 2000-2024

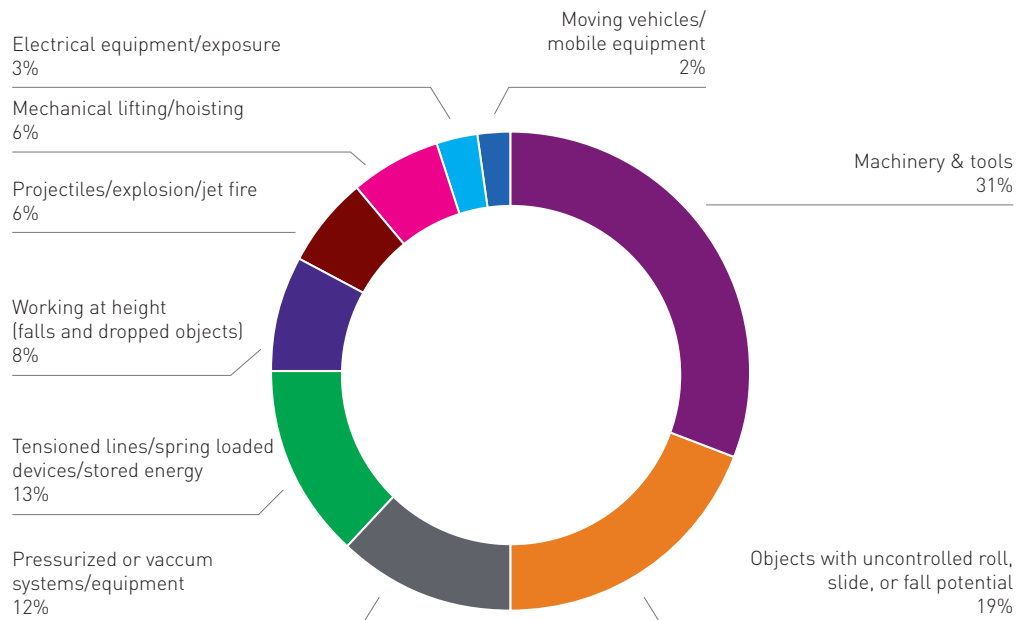


Figure 7 – Line of Fire PI injuries 2022-2024

References

For detailed FPI definitions: <https://iogp.org/fpi>.

There are a number of IOGP Reports that support managing the risks associated with the 10 elements:

- IOGP Human Performance Principles, <https://www.iogp.org/workstreams/safety/safety/human-performance/>
- IOGP Report 365 – *Land transportation safety practice*
- IOGP Report 376 – *Lifting and hoisting recommended practice*
- IOGP Report 459 – *Life-Saving Rules*
- IOGP Report 459-1 – *Life-Saving Rules – Start Work Checks*
- IOGP Report 510 – *Operating Management System Framework for controlling risk and delivering high performance in the oil and gas industry*
- IOGP Report 577 – *Fabrication site construction safety recommended practices*
- IOGP Report 690 series – *Offshore Helicopter Recommended Practices*

For user guides and safety performance go to <https://data.iogp.org>.



International
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LIFE-SAVING RULES



www.iogp.org/life-savingrules/

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