

Potentially Serious Incidents Summary

2019 Q1 - 2023 Q2 DATA

October 2023

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EXECUTIVE SUMMARY

To help industry understand common trends and encourage conversations around prevention efforts, this report summarizes potentially serious incident (PSI) data from the Alberta oil and gas industry for the period Q1 2019 to Q2 2023. The number of companies reporting PSIs increased from 152 to 182 since the 2022 report, but only 6% of active oil and gas companies—roughly one-third of industry activity based on person years—submit PSI reports.

The most common follow-up actions were *training* and *changed policy*, with no *eliminated hazard* or *substituted equipment* being reported in Q1 and Q2 2023. Although *training* and *changed policy* are often an appropriate control depending on the context of the incident, a stronger focus on elimination, substitution and engineering controls is worthy of future consideration.

Energy Safety Canada (ESC) analyzed *Contact or struck with object, tool or equipment* PSIs, grouping the incidents into various categories to identify additional insights. This analysis is included in Appendix A and identified 30 incidents that could have been classified as *struck by falling object* rather than *Contact or struck with object, tool or equipment*. This indicates there are opportunities to improve the selection of classification criteria of PSIs at the time of entry into [Alberta Occupational Health and Safety PSI Portal](#).

Approximately half of these incidents involved gravity followed by pressure, motion and mechanical energy types. ESC's [Life Saving Rules](#) applied to approximately half of the PSIs with the most prevalent being Line of Fire and Working at Height.

Approximately three quarters of the incident data were personal safety with one quarter being process safety; reflecting the need for the integration of various safety programs to manage risks associated with dropped objects and pressure releases. ESC has various program resources to help industry address these issues such as:

- [Energy Wheel](#)
- [Dropped Objects](#)
- [Building Capacity to Manage Pressure](#)
- [Process Safety](#)

As industry continues to improve in health and safety performance, the challenges that exist will evolve over time from prevention problems to prediction problems. Approximately half of the PSIs were prediction problems. Most of the prediction problems were PSIs that involved complex causal mechanisms likely beyond what traditional risk management strategies can accommodate

Increasing focus on surfacing weak signals, latent conditions and safeguard challenges is crucial to improve incident predictions. This means creating a psychologically safe environment for workers to learn through various strategies and tools, including the [4Ds and Learning Teams \(Human and Organizational Performance\)](#). Resilient systems can only be built once this approach is coupled with a focus on hazardous energy, safety-critical steps, critical safeguard verification and capacity to fail safely.

PSI DEFINITION

According to Alberta OH&S, “a PSI is reportable when the incident had a likelihood of causing a serious injury or illness, and there is reasonable cause to believe that corrective action may need to be taken to prevent recurrence.”

Employers can report PSIs online and must include a description of the event, the number of people involved and/or injured, and any follow-up actions they implemented.

The definition of PSI was significantly revised at the end of 2018 by Alberta OH&S. Therefore, only data from 2019 onwards is included in this report.

1.0 INTRODUCTION & OBJECTIVE

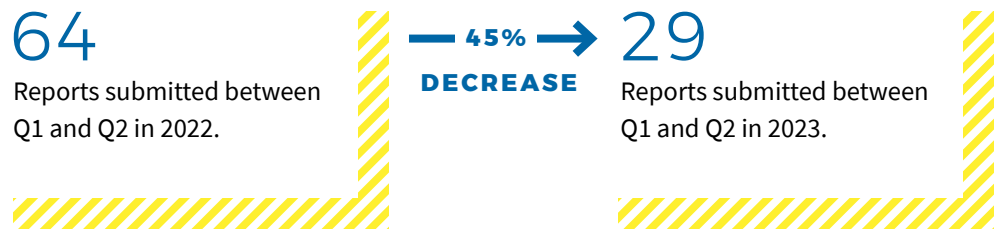
In 2018, it became mandatory for Alberta employers to report potentially serious incidents (PSIs) to Alberta Occupational Health and Safety (OH&S). OH&S has provided some of the resulting data to Energy Safety Canada (ESC), for ESC’s funding industry codes.

This report provides a summary of potentially serious incident data from the Alberta energy industry for the purposes of understanding common trends and encouraging broader conversations around industry prevention efforts.

Data represents the time period of Q1 2019 to Q2 2023.

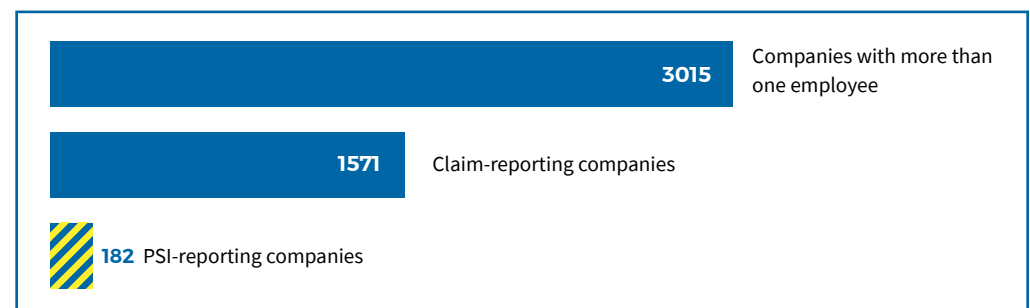
2.0 REPORTING RATES & TRENDS OVER TIME

The number of reports has decreased due to waning COVID-19 numbers.



Since 2019, there were about 3,000 registered companies in Alberta’s oil and gas industries with more than one employee. Only a small portion of active oil and gas companies (6%) have submitted PSI reports since the program began. For comparison, around half (1,500 companies) had an incident that became an injury claim with the WCB.

COMPANY COUNTS IN ALBERTA O&G



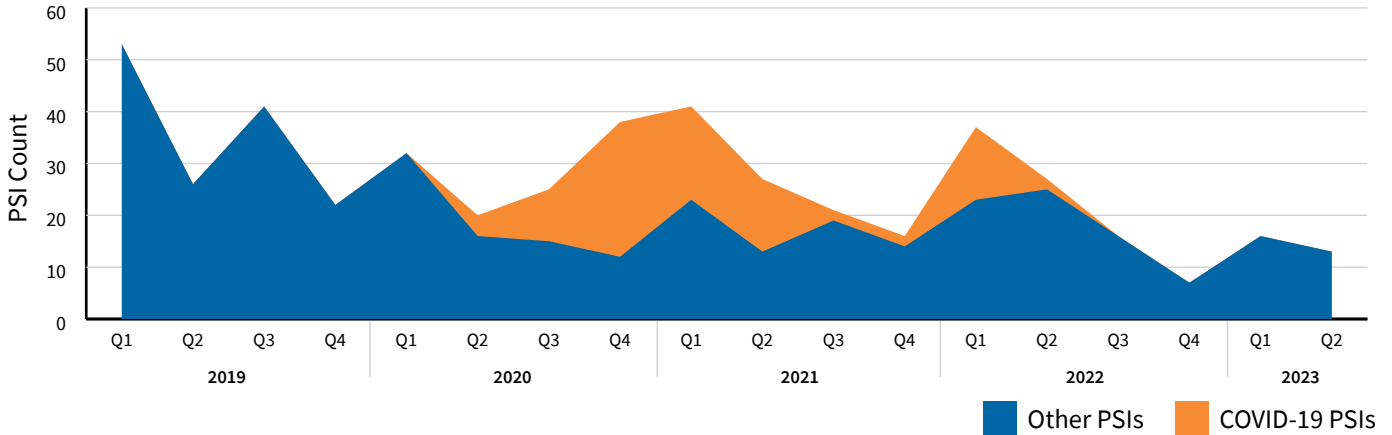
ACTIVITY IN ALBERTA O&G (PERSON YEARS)



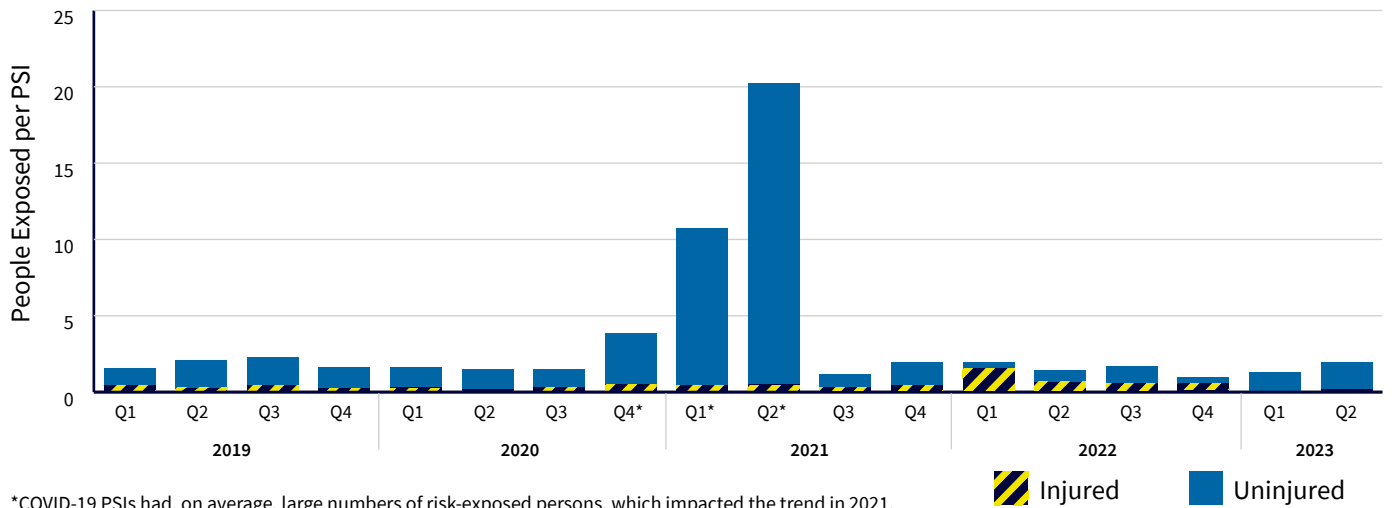
2.0 REPORTING RATES & TRENDS OVER TIME

Opportunities exist to encourage more reporting across the entire industry.

REPORTED POTENTIALLY SERIOUS INCIDENTS, BY QUARTER



PEOPLE AT RISK PER INCIDENT



*COVID-19 PSIs had, on average, large numbers of risk-exposed persons, which impacted the trend in 2021.

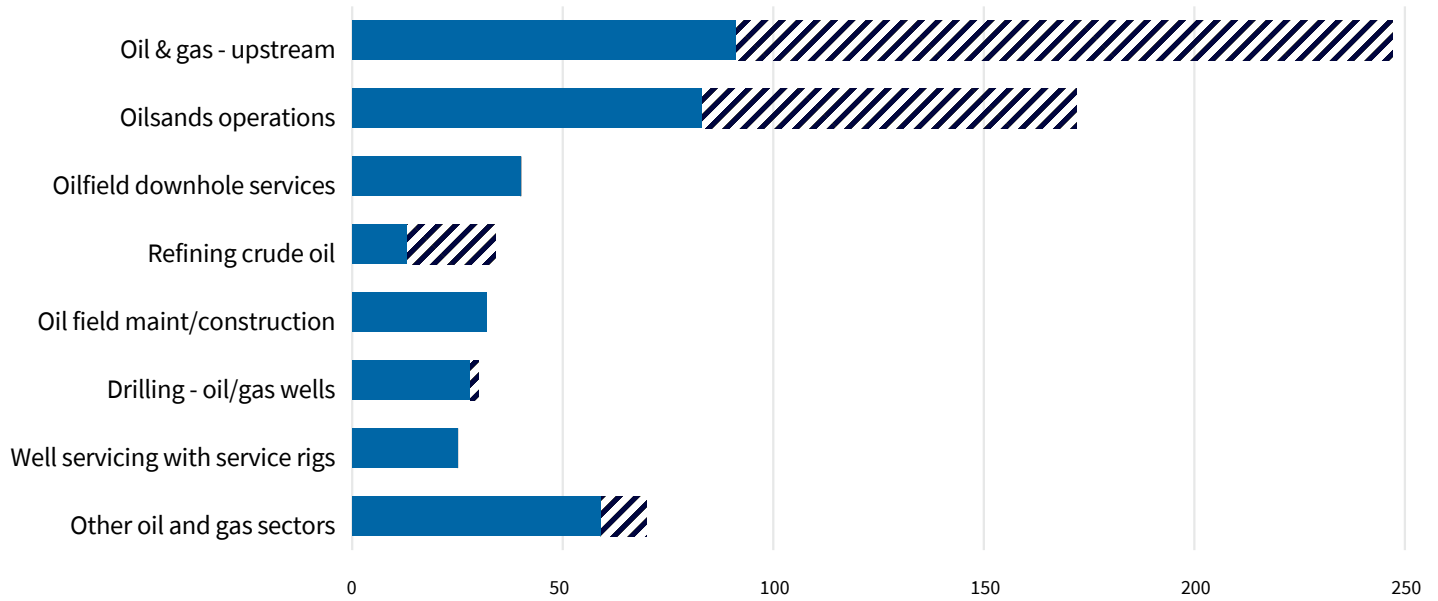
During a PSI, on average four people were exposed to risk, and 12% of exposures resulted in an injury. Companies are encouraged to reflect on their own ratio of near miss PSIs to injury PSIs.

Year	Participating companies	PSI report count	People exposed	People injured	Average exposed per PSI	% injured per exposed
2019	83	142	266	52	1.87	20%
2020	75	115	265	40	2.30	15%
2021	81	105	1055*	45	10.05	4%
2022	80	87	146	88	1.68	60%
2023 Q1-Q2	22	29	46	3	1.59	7%
Total	248	478	1778	228	3.72	13%

*Impact is associated with COVID-19.

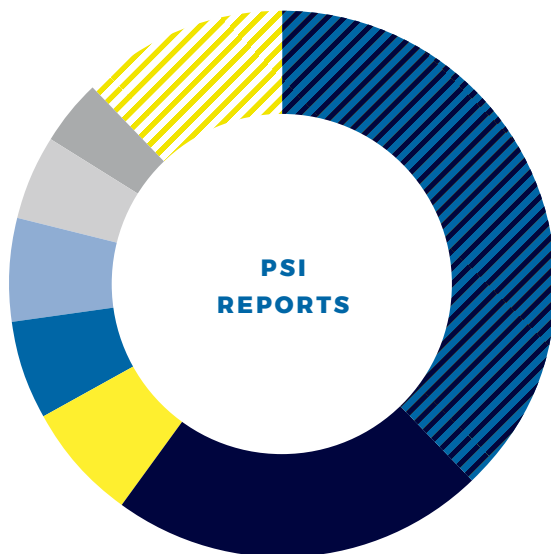
3.0 REPORTS PER INDUSTRY SECTOR

PSI REPORTS (INCIDENT RELATIONSHIP BY SECTOR)



Reports where both a prime contractor and the employer were involved are counted twice.

Prime Contractor Employer



- 38% Oil & gas - upstream
- 22% Oilsands operations
- 7% Oilfield downhole services
- 6% Refining crude oil
- 6% Oilfield maintenance/construction
- 5% Drilling - oil/gas wells
- 4% Well servicing with service rigs
- 12% Other oil and gas sectors

4.0 INCIDENT CLASSIFICATIONS

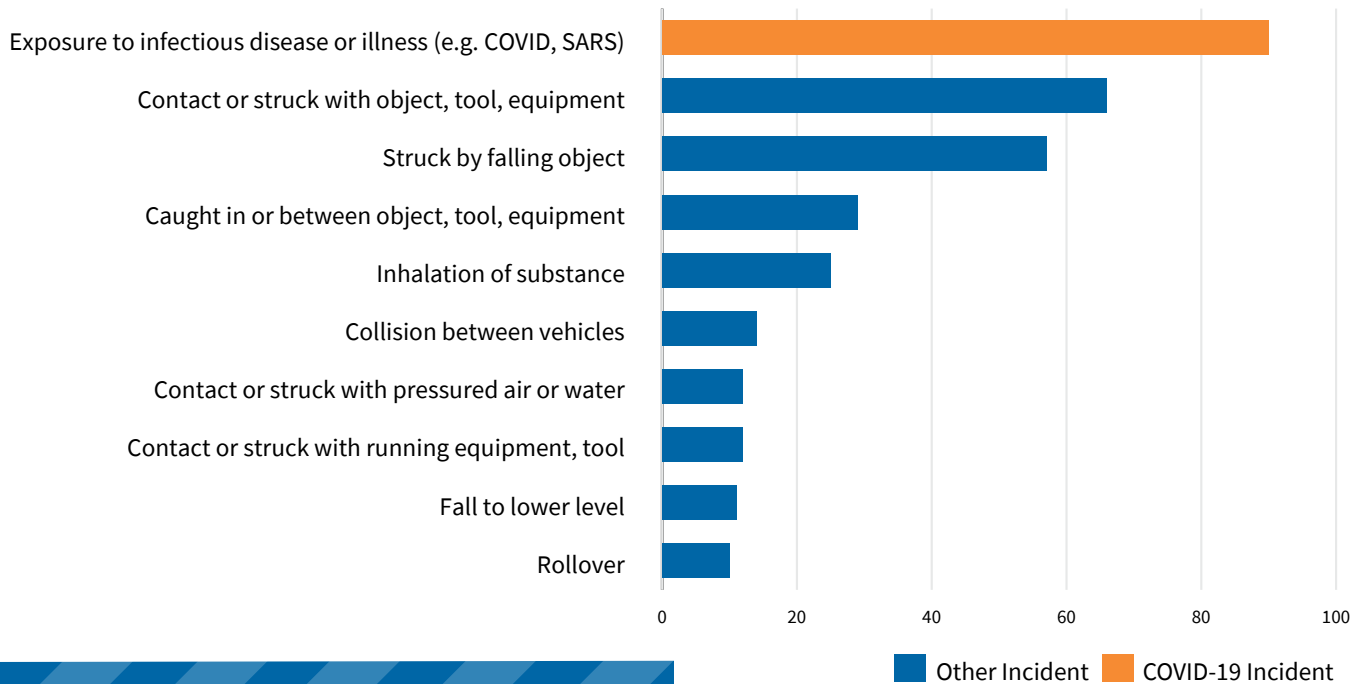
The graphs below show the most common types of incidents that could have caused serious injuries and the sources of those potential injuries.

Outside of COVID-19, over half of the PSIs are line of fire related, most significantly with workers being struck or crushed by construction materials.

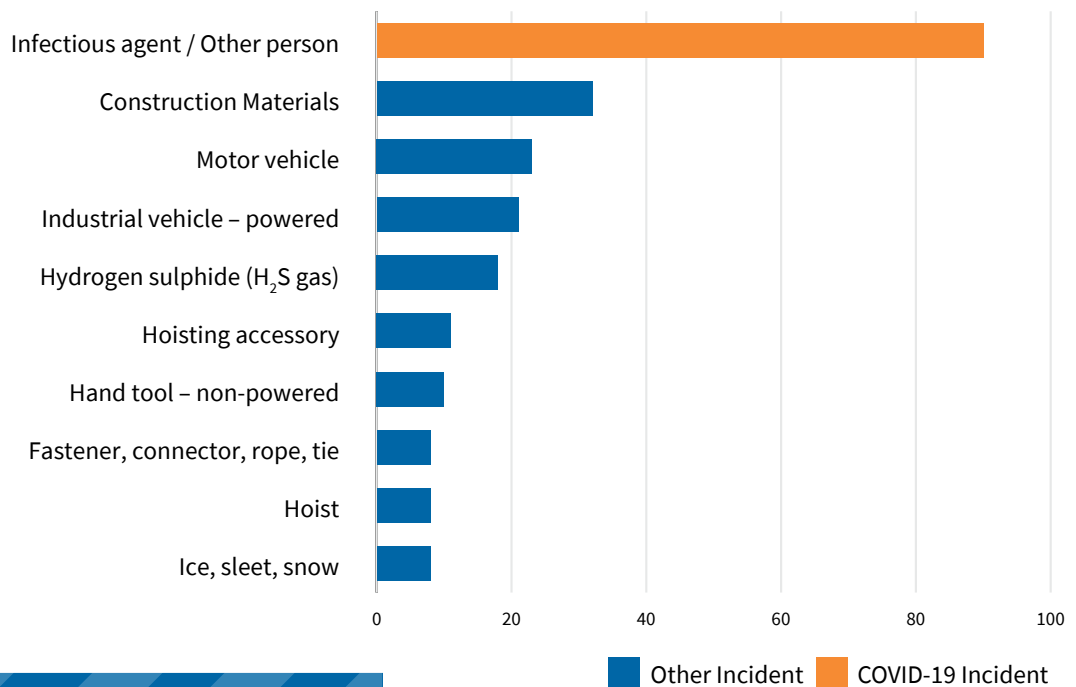


LINE OF FIRE

TOP TEN INCIDENT TYPES (INCIDENT COUNT)



TOP TEN SOURCES OF INCIDENT (INCIDENT COUNT)



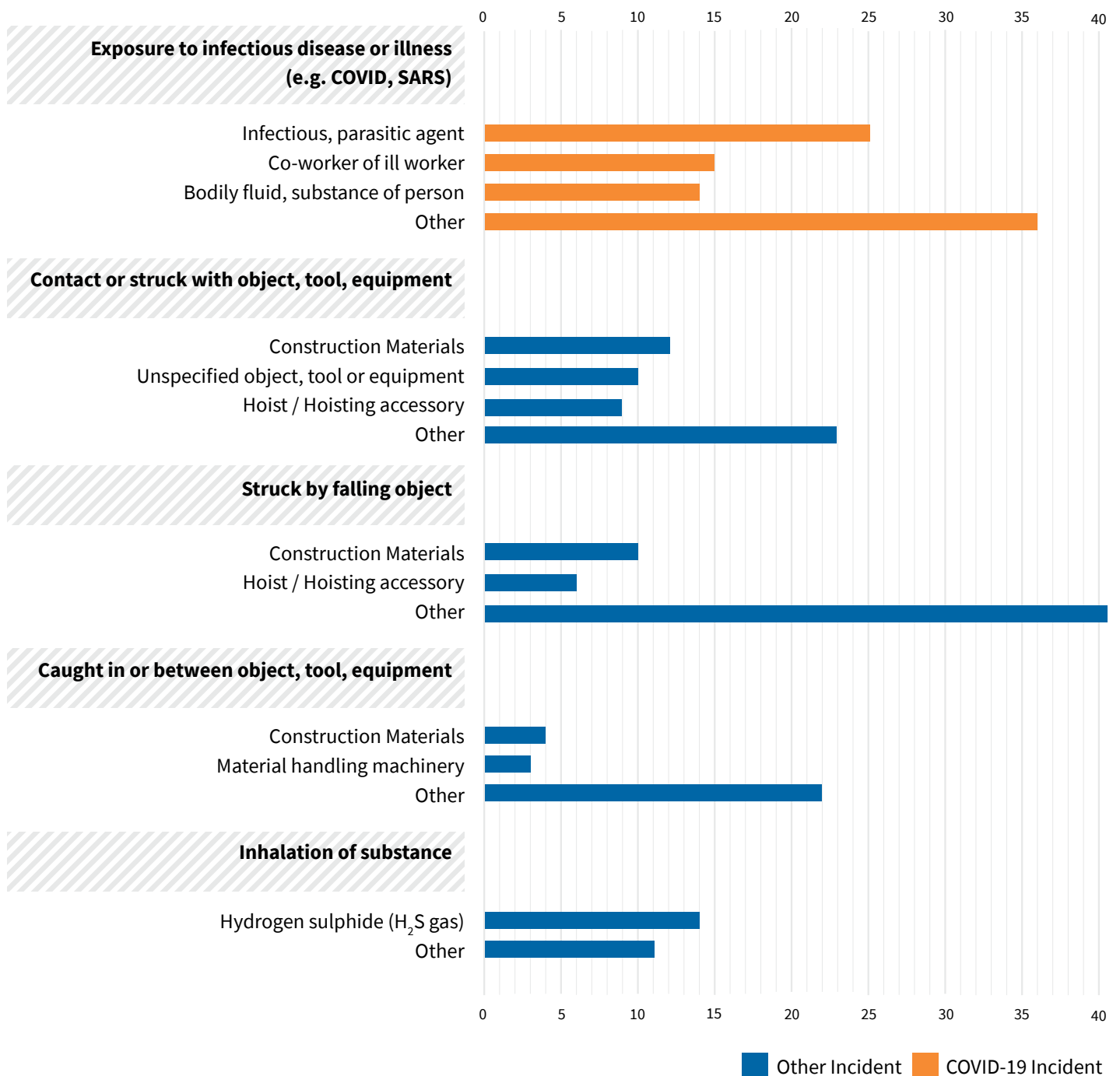
4.0 INCIDENT CLASSIFICATIONS

4.1 SOURCE PER TYPE

The main sources of the top five incident types are listed below.

Note that some types of PSI have a large *Other* category for source of incident. This is simply due to the large number of potential sources (hoists, machinery, ice, fasteners, etc.); there is no major source of incident that is not shown.

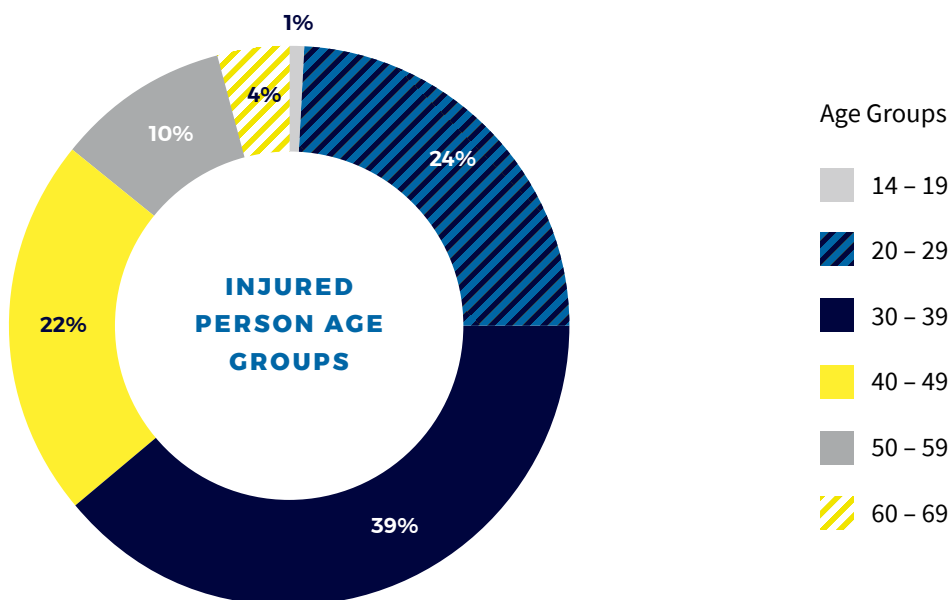
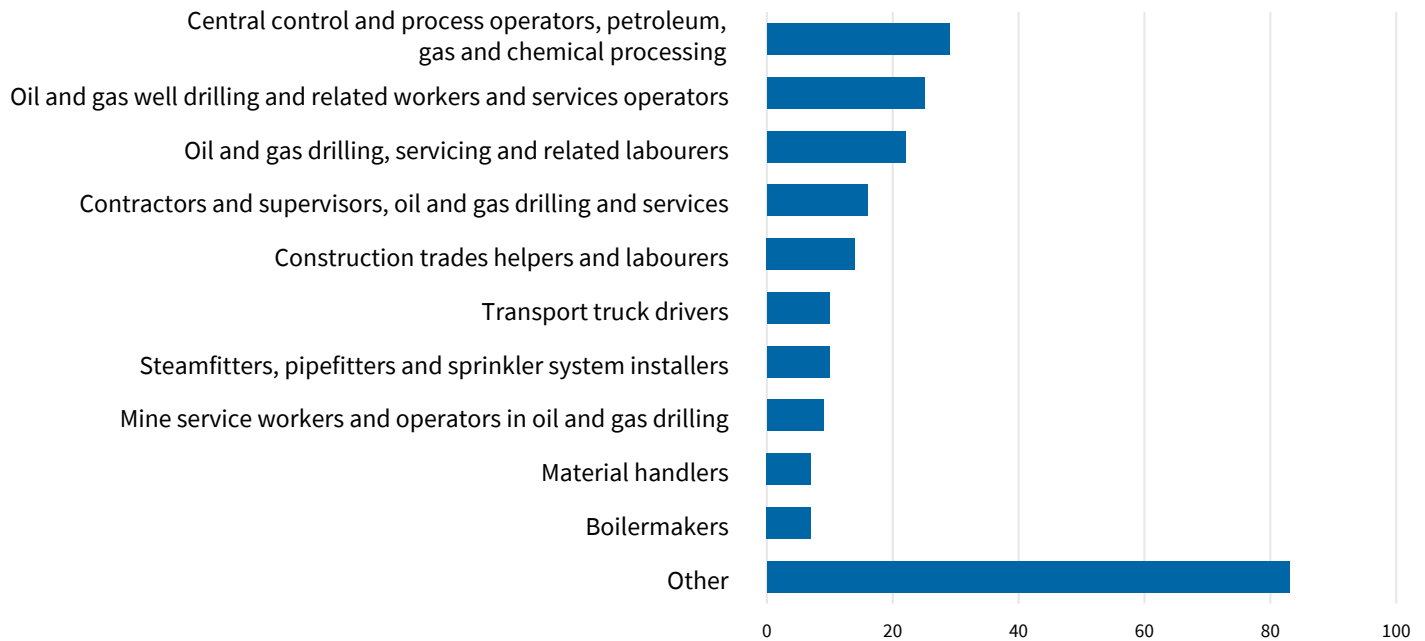
SOURCES OF THE TOP FIVE INCIDENT TYPES (INCIDENT COUNT)



5.0 INJURED PERSON DEMOGRAPHICS

The graphs below show the demographics of people who were injured during a PSI. PSIs where no people were injured are not accounted for. Note that these are only injuries related to reported PSIs. For information about all injuries in the energy industry, visit Energy Safety Canada’s Performance Metrics Program [webpage](#).

INJURED PERSON OCCUPATIONS



6.0 INCIDENT FOLLOW-UP

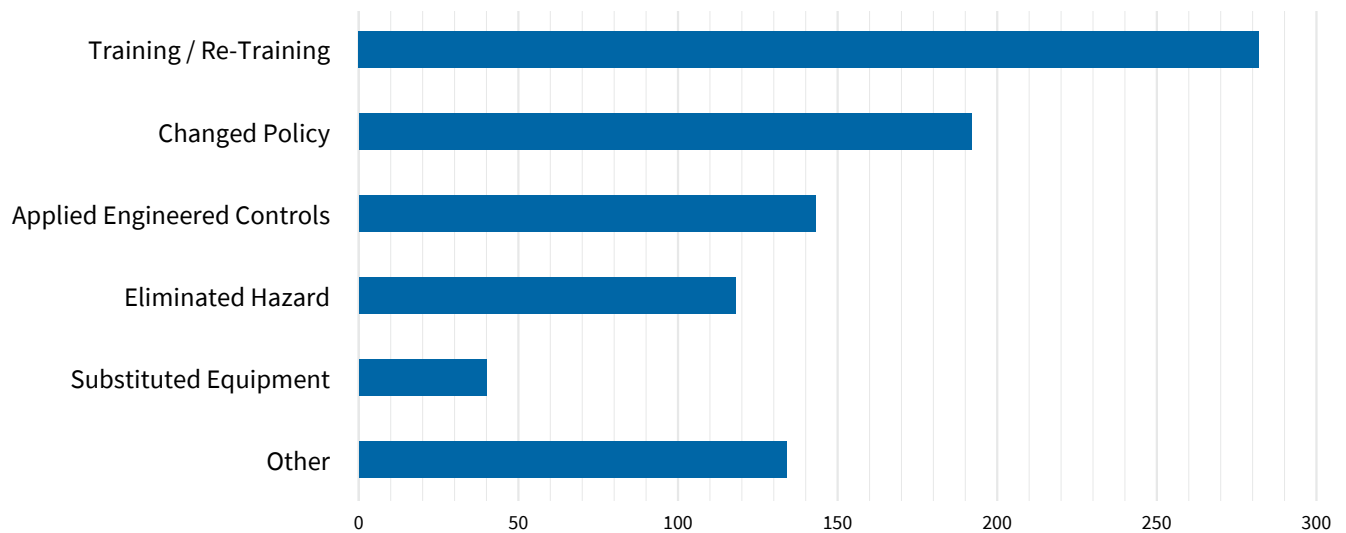
On average, one or two follow-up actions are implemented after a potentially serious incident is reported.

Training and Changed Policy are the most common follow-up actions.

A stronger focus on elimination, substitution and engineering controls should be considered.



FOLLOW-UP CONTROLS IMPLEMENTED

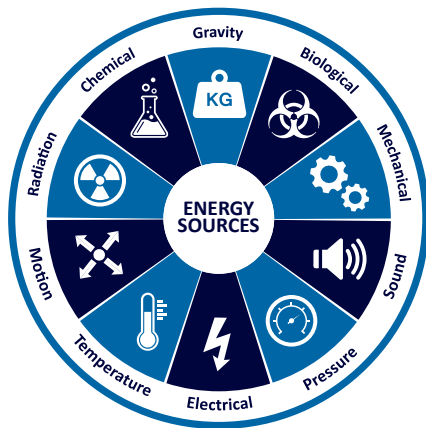


YEAR	2019	2020	2021	2022	2023 Q1-Q2	Total
Total PSI Count	142	115	105	87	29	478
All Controls	210	250	225	179	45	909
Training / Re-Training	55	77	77	55	18	282
Changed Policy	56	50	45	26	15	192
Applied Engineered Controls	26	47	32	32	6	143
Eliminated Hazard	36	26	26	30	0	118
Substituted Equipment	11	11	7	11	0	40
Other	26	39	38	25	6	134
Controls per PSI	1.5	2.2	2.1	2.1	1.6	1.9

APPENDIX A

Additional analysis of Contact or struck with object, tool or equipment.

ESC analyzed *Contact or struck with object, tool or equipment* PSIs. ESC analysts added data classification categories to identify additional insights. The data was grouped into categories: energy type by way of the energy wheel, personal and process safety, Life Saving Rules, capacity to fail safely and prediction or prevention.



The data consists of a total of 58 data points. Approximately half of these incidents involved gravity followed by pressure, motion and mechanical energy types. ESC's [Life Saving Rules](#) applied to approximately half of the PSIs with the most prevalent being Line of Fire and Working at Height.

Gravity: Half of Incidents

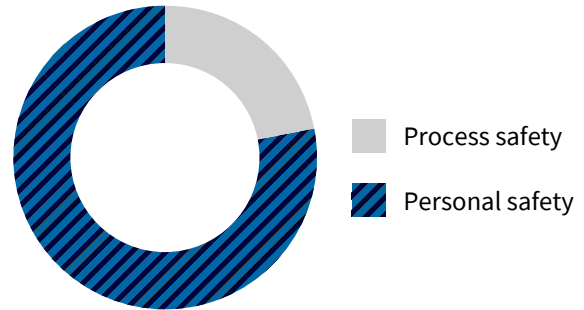


WORKING AT HEIGHT



LINE OF FIRE

Approximately three quarters of the data were personal safety, dominated by gravity as the energy type with one quarter being process safety, dominated by pressure. Approximately half of the process safety incidents were related to mechanical integrity failures largely from 'over pressure'.



Mechanical Integrity Failure Process Safety Incidents



ESC identified 30 incidents that could have been classified as *struck by falling object* rather than *Contact or struck with object, tool or equipment*. This indicates there are opportunities to improve the selection of classification criteria of PSIs at the time of entry.

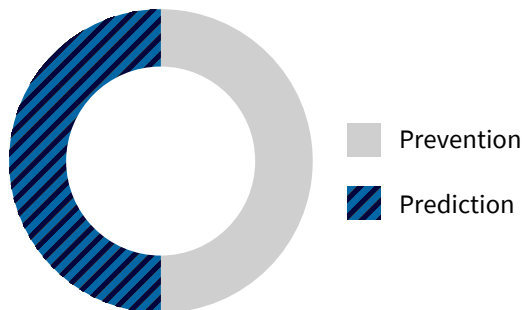
30 Gravity Incidents

APPENDIX A

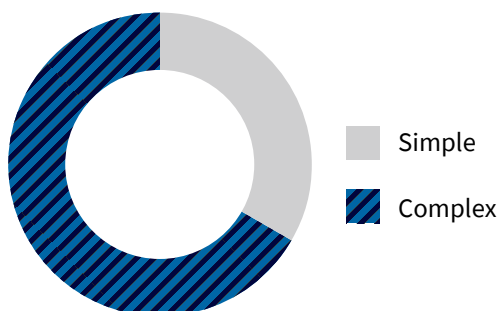
Approximately half of follow-up actions for PSIs involving human error have built capacity to fail safely if an error or mistake is made. This half is very positive and indicative of follow-up actions that make a lasting difference in preventing serious incidents and fatalities. However, with 50% not building capacity to fail safely, work remains.

As industry continues to improve in health and safety performance, the challenges that exist will evolve over time from prevention problems to prediction problems. For example, a prevention problem could be the lack of a dropped objects program, whereas a complex prediction problem could be a bolt with a stress fracture that drops from height and deflects outside an exclusion zone. Prevention problems have causes that are well known within industry and have available controls. Prediction problems have causes that are unexpected or otherwise difficult to predict, with some being complex or the confluence of multiple factors. Approximately half of the PSIs were prediction problems. Most of the prediction problems (two thirds) were PSIs that involved complex causal mechanisms likely beyond what traditional risk management strategies can accommodate.

Increasing focus on surfacing weak signals, latent conditions and safeguard challenges is crucial to improve incident predictions. This means creating a psychologically safe environment for workers to learn through various strategies and tools, including the [4Ds and Learning Teams \(Human and Organizational Performance\)](#). Resilient systems can only be built once this approach is coupled with a focus on hazardous energy, safety-critical steps, critical safeguard verification and capacity to fail safely.



Prediction Type



RESOURCES

[Energy Safety Canada PSI Program](#)

[Energy Safety Canada PSI Guideline](#)

[Potentially serious incident reporting: legislation updates](#)

[List of oil and gas industry sectors](#)

GLOSSARY

Industry Sector

Groupings of employers who have similar businesses and risks as one another. Defined by WCB Alberta. This report contains data from all Alberta oil and gas industry sectors.

Person

A PSI is not limited to workers. If it involves someone who is not a worker, it is still considered a PSI if it resulted from work activities at the work site or could have happened to a worker.

PSI

Potentially serious incident. A PSI is reportable when the incident had a likelihood of causing a serious injury or illness, and there is reasonable cause to believe that corrective action may need to be taken to prevent recurrence.

WCB

Workers' Compensation Board. The mandate of the WCB is to provide compensation to workers who are injured on the job, and help them recover and return to work.

DISCLAIMERS

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