# Mining, Oil & Gas: Process Safety Plus Personnel Systems Stats and Facts

## FACTS

1. **Loss of Containment:** Failures in pipes, valves, tanks, or well control can release flammable or toxic materials, leading to fires, explosions, or toxic exposure.
2. **Energy Isolation Gaps:** Inadequate lockout, line breaking, or depressurization during maintenance exposes workers to stored mechanical, hydraulic, and pressure energy.
3. **Process Upsets:** Deviations in pressure, temperature, or flow can escalate rapidly into runaway events if alarms, interlocks, or operator responses fail.
4. **Human–System Interface Errors:** Poorly designed controls, alarms, or procedures increase the chance of misinterpretation and delayed response during abnormal operations.
5. **Contractor Integration Risk:** Contractors unfamiliar with site-specific process hazards face higher exposure during shutdowns, turnarounds, and non-routine tasks.
6. **Fatigue & Shift Handover Failures:** Long shifts and poor handovers degrade situational awareness, increasing the likelihood of critical process mistakes.

## STATS

- The Bureau of Labor Statistics reports that mining and oil & gas extraction have fatal injury rates several times higher than the all-industry average in the U.S. (2021–2023).
- Process safety incidents investigated by the U.S. Chemical Safety and Hazard Investigation Board consistently identify management system and human-factor failures as contributing causes in major explosions and fires.

- U.S. data show dozens of worker fatalities each year in oil & gas operations tied to fires, explosions, and exposure events, despite overall workforce size (BLS).
- In the US, private sector mining, quarrying, and oil and gas extraction recorded 127 fatal occupational injuries in 2023, with rates remaining high compared to other industries (e.g., 16.9 per 100,000 workers in mining/oil/gas extraction).
- In Canada, mining and petroleum development saw 1,699 total injuries (lost-time and modified-work) in Alberta in 2023, with sprains/strains at 48% and bodily reaction/exertion as top causes.