EHS Risk Analysis Report

Operational Safety Intelligence System

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1. Purpose of This Report

This report translates raw EHS data into actionable business intelligence for management.

It answers five executive-level questions:

- Where are we exposed to safety risk?
- Which departments and sites are driving incidents?
- Are audits and training preventing accidents?
- What factors are causing repeated failures?
- What actions will reduce risk fastest?

2. Data Sources & System Design

The EHS monitoring system integrates three operational data streams:

Data Source	What It Measures
Incident Logs	Injuries, near-misses, severity, lost workdays
Safety Audits	Compliance scores, non-conformances
Training Records	Certification status, expiry, completion

All data was cleaned, standardized, and modelled in Big Query and exposed to Power BI through analytical tables and dimensional models.

This creates a single source of truth for EHS performance.

3. Overall Safety Performance

The company recorded:

- **200 total incidents**
- **156 lost-time injuries**
- **LTIFR = 12.25**
- **Average severity = 2.28**
- **Near-miss ratio = 0.43**

These numbers indicate **material operational risk.**

A near-miss ratio below 1.0 suggests under-reporting — a leading indicator of hidden hazards.

4. Severity & Impact Analysis

Over 54% of incidents are classified as High severity, meaning they result in:

- Medical treatment
- Lost workdays
- Or permanent injury risk
- This creates direct cost through:
- Compensation
- Overtime
- Production disruption
- Regulatory exposure

High severity also signals control failures, not just bad luck.

5. Site Risk Comparison

Site	Risk Profile
Plant A	Highest incident volume, high lost-time injuries
Plant B	Lower volume, better injury control

Although audit scores are similar, **Plant A has significantly worse safety outcomes**, showing that **formal compliance does not equal operational safety.**

6. Department Risk Analysis

The Production department is responsible for:

- The highest number of incidents
- The highest total lost workdays
- The highest average severity

Maintenance and Logistics show moderate risk, while office-based functions remain low risk.

This indicates that **frontline operations are the dominant risk driver**.

7. Audit vs Reality Gap

Average audit score: 84%

Yet incident rates remain high.

This reveals a **compliance illusion**:

- Paper controls exist
- But real-world behaviors do not follow them

Departments pass audits but still:

- Bypass machine guards
- Ignore PPE
- Perform unsafe manual handling

8. Training Compliance

Only 41% of employees have valid training.

This means:

- The majority of the workforce is operating **without certified safety competence**
- Expired training is a major leading indicator of accidents

Employees involved in incidents show a **higher probability of missing or expired training**.

9. Root Cause Patterns

Top contributors to incidents:

- Unsafe lifting
- Missing machine guards
- Wet or obstructed floors
- PPE non-compliance

These are **preventable, low-cost hazards**, indicating poor safety enforcement rather than technical limitations.

10. Predictive Risk Indicators

Three variables strongly predict incidents:

Risk Signal	Meaning
Low audit scores	Poor local safety discipline
Training expiry	Workers unprepared
High near-miss counts	Hidden hazard accumulation

These can be used to forecast high-risk departments before accidents happen.

11. Business Impact

Current safety performance exposes the company to:

- Regulatory fines
- Higher insurance premiums
- Production downtime
- Staff turnover
- Brand and legal risk

Reducing incidents by 20% would likely save:

- Thousands of lost labor hours
- Significant compensation costs
- Audit remediation costs

12. Management Recommendations

Immediate (0–30 days)

- Force training validation for all Production staff
- Lockout/tagout enforcement
- PPE compliance checks in Plant A

Medium-Term (30–90 days)

- Near-miss reporting incentives
- Targeted audits for lifting & guarding
- Supervisor accountability dashboards

Strategic

- Use Power BI to track:
    - High-risk departments
    - Training expiry
    - Audit vs incident gaps

13. Conclusion

This EHS analytics system converts fragmented Excel files into a **live risk intelligence platform.**

Instead of reacting to accidents, leadership can now:

- See where risk is building
- Act before injuries occur
- Measure the ROI of safety programs

This is the foundation of a **data-driven safety culture.**