

Construction Hazards and Risks Control

Lecture Title: – Enhancing Construction Safety
Through Effective Data Management

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Undergraduate Diploma in
Occupational Health and Safety

Why Data Management Matters?

- Evidence of compliance with SL 646.27
- *Safe access and egress, housekeeping, lighting, welfare facilities, emergency arrangements also safety documentation e.g.; inspection records, risk assessments, toolbox talks attendance sheets, PTW records. No tangible proof will be difficult to show compliance.*
- Supports planning, coordination and supervision
- *Construction sites are dynamic with multiple trades, changing hazards, subcontractors working simultaneously. Safety records helps to plan safe sequencing of works, coordinate high-risk activities and monitor whether controls required remain effective throughout the project lifecycle*



- Demonstrates due diligence
- *Due diligence refers to the employer's ability to show they have, identified the hazards, implemented suitable control measures and monitoring safety performance.*
- *Maintaining proper documentation shows that safety is proactively managed reactive. Due diligence can significantly reduce liability following incidents, as records prove that the employer fulfilled the obligation under Chapter 646 and SL 646.27*
- Prevents repeated unsafe practices
- *By analysing safety data e.g.; near-miss reports, inspection findings and incident statistics.*
- *Patterns can be identified (recurring trip hazards, poor housekeeping, lack of PPE) Corrective actions will be implemented before accidents occur*

Key Safety Data in Construction

- Incident and accident reports
- Near-miss reports
- Inspections and audit
- Risk assessments & method statements
- Training records



Incident & Accident Data

- Mandatory reporting and investigation – Employee are obliged to report and employers are obliged to investigate these reports.
- Identifies systemic failures
- Required for corrective measures

Example Scenario 1 – Scaffold Collapse

- Repeated minor defects recorded and no inspections
- Data not analysed collectively
- Collapse caused injury
- Lesson: trend analysis could have prevented failure

Near-Miss Reporting

- SL 646.27 promotes preventive action
- *(maintain safe workplaces, continuously monitor site conditions, reduce risks at source ALARP)*
- *The legislation is preventive by design. It is not only concerned with reacting to accidents but with identifying dangers before harm occurs.*
- • Near-misses show where controls are weak
- *E.g. a worker slipping but not falling, tools falling from height without striking anyone. Such events show failures in controls such as housekeeping, guarding (ex. toe boards in scaffolds)*
- *Near misses provide early warning signs, allowing corrective action before incidents happen*

- Encourages proactive safety management
 - *When near miss data is reported, recorded and analysed;*
 - *Site Managers and Project Supervisors can:*
 - *Improve task planning*
 - *Strengthen control measures*
 - *Update risk assessments*

Example Scenario 2 – Near Miss Ignored

- Loose edge protection reported twice
- No corrective action recorded
- Worker later fell from height
- Lesson: undocumented action = non-compliance

Inspection & Audit Data

- Required for workplace monitoring
- *It is required that the workplace to be maintained in safe condition, regularly checked for hazards and adjusted as work progresses*
- *Regular monitoring ensures hazards introduced by new activities, trades or equipment are identified and controlled.*
- Includes plant, PPE, access and housekeeping
- Effective inspections must include
 - Plant and equipment: e.g. guards, stability, maintenance condition
 - PPE: e.g. availability, suitability, correct use and condition
 - Access & egress: e.g. stairs, walkways, scaffold ladders
 - Housekeeping: e.g. waste accumulation, storage of material and trip hazards



- Forms documented proof of supervision
- *Inspection records demonstrate that:*
 - *Supervisors are actively monitoring site conditions*
 - *Identified hazards are being addressed*
 - *Safety responsibilities are fulfilled*
- *In the event of an accident or OHSA inspection, records provide objective evidence that supervision was in place and effective.*



Risk Assessment Data

- Required before work starts
- Must be site-specific
- Must be suitable, sufficient and systematic
- Must be vetted
- Reviewed when trends indicate increased risk



Example Scenario 3 – Manual Handling Injuries

- Multiple minor injuries recorded
- Data trend identified same task
- Mechanical aids introduced
- Result: Injury rate reduced



Collecting Data Effectively

- It is of utmost importance that:
 - Simple formats are used to be easily read and understood
 - Worker participation (by reporting also near miss)
 - Toolbox talk feedback to be constructive and provides a way forward
 - Verification of such data by e.g. site inspections and reviewing reports



Storing Safety Data

- Every Site shall have its own file (named) to avoid storing data in the wrong file.
- Digital systems shall be used to reduce lack of paper load
- Easily accessible to management & inspectors for viewing
- • Retained as required by law in case for reviewing by the OHSA



Data Accuracy & Integrity

- It is highly important to have clear descriptions of what happened to avoid lack of information being provided.
- Consistent terminology which will help you to find easier the trends
- Timely updates especially when it comes to provide the root cause and corrective actions
- Confidential handling (important to follow GDPR regulations)



Analysing Safety Data

- By tracking frequency and types of incidents
- Identifies repeating hazards and risk patterns
- Enables comparison between sites and tasks



Using Data to Improve Safety

- Update risk assessments
- *Having accurate data will help us to identify and update/review risk assessments*
- Improve supervision
- *Data showing during which task is a trend of creating an incident will have more frequent supervision*
- Target training
- Such data will also help us to identify areas if employees have lack of training
- Allocate resources – such as budgets and also safety inspections



Collect Incident Data

- The first step is to gather precise and relevant information about every incident that takes place on your construction site. This includes details such as:
- Date
- Time
- Location/area
- Type
- Severity
- Impact of the incident,
- Names and roles of those involved
- The equipment and materials used
- Any contributing environmental or human factors.



- Use methods like incident reports, interviews, surveys, inspections, photographs, and videos to collect this data. Ensure the information is securely stored and organised in an accessible format, such as a database, spreadsheet, or cloud-based system.

Organise Incident Data

- The next step is to organize the incident data into meaningful categories to better understand the nature and extent of the problem.
- For instance, incidents can be classified by type (e.g., falls, slips, fires, electrical shocks)
- Severity (First Aid, Medical, Lost Time Injury)
- Location (specific site areas or zones)
- Cause (human error, equipment failure, design flaw).
- To visualize and analyse the data effectively, consider using tools such as charts, graphs, tables, or matrices.



Analysing the Data

- The third step involves analysing the incident data to uncover root causes, identify trends and patterns, and assess the effectiveness of current controls and measures.
- Various techniques can be used for this analysis, such as the 5 Whys method. These tools help delve into the underlying factors and conditions that contributed to the incidents, enabling you to prioritize the most significant and recurring issues



Reporting Data

- The fourth step is to share the incident data with relevant stakeholders, such as management or clients. Reporting this data is essential for communicating the results of your analysis, demonstrating compliance with legal and contractual obligations.



Implement incident data

- The next step is to act on the recommendations and insights gained from your incident data analysis. This involves implementing specific measures to eliminate or mitigate the risks and hazards that led to the incidents, as well as enhancing your safety culture and overall performance.
- Tools like action plans, checklists, and schedules can help assign responsibilities, set deadlines, and track progress.
- Additionally, methods such as training, feedback, and incentives can be used to engage and motivate workers and stakeholders. It's important to monitor and evaluate the effectiveness of these actions and make adjustments as necessary.



Review incident data

- The final step is to regularly review and update the incident data to ensure your analysis and actions remain current and effective.
- This involves verifying and updating the data, identifying new or emerging incidents, monitoring changes and trends, and evaluating outcomes and benefits.
- Tools like audits and reviews can be used to gather feedback and additional data.
- Sharing insights through methods such as lessons learned, best practices, or case studies can also help reinforce success and promote continuous improvement.
- Remember to celebrate and acknowledge achievements while identifying and addressing any gaps or challenges that arise.



Lost Time Injuries Frequency Rate - LTIFR

- $$\frac{(\text{Number of lost time injuries in the reporting period}) \times 1,000,000}{(\text{Total hours worked in the reporting period})}$$

Example your company's LTIFR is 2.4, which means there were 2.4 lost time injuries for every one million man-hours worked.
- Number of lost time injuries – H&S
- Total hours worked for the reporting period – HR

Formula

$$\text{LTIFR} = \frac{(\text{Number of lost time injuries in the reporting period}) \times 1,000,000}{\text{Total hours worked in the reporting period}}$$

Example :After reviewing and compiling your safety data, you've determined that there were six lost time injuries in the past year at your manufacturing company and a total of 2,500,000 hours worked.

- To calculate your LTIFR, simply plug those numbers into your formula:

$$\text{LTIFR} = (6 \times 1,000,000) / 2,500,000 = 2.4$$



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