

LIFE SAVING AMBULANCE MONITORING USING IMAGE PROCESSING

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Abstract: EHS incident management refers to the people, procedures and workflows that record, analyze, and report on incidents, while implementing corrective actions to proactively minimize or mitigate future risk. An EHS incident is an unexpected event which results in (or has the potential to cause) damage, injury, or some form of disruption to your business.

EHS Incident Management is a key element of a commitment to continuous improvement of safety and compliance management programs. Every incident provides an opportunity to identify workplace hazards and to mitigate or remove the associated root cause and risks.

Keywords: Incident Management, Potential to cause & Opportunity.

1. INTRODUCTION

Health, Safety and Environment plan (HSE) has been prepared to provide a framework for site personnel to plan and develop a program, to achieve the objective contained in the Health, Safety, Environment and Policy. Company shall establish a comprehensive Health, Safety & Environmental Management Systems and undertake sole responsibility of Health, Safety, Fire protection and Environmental Protection of the work activities.

2. LITERATURE SURVEY

An incident is an event that could lead to loss of, or disruption to, an organization's operations, services or functions. Incident management (IcM) is a term describing the activities of an organization to identify, analyse, and correct hazards to prevent a future re-occurrence. These incidents within a structured organization are normally dealt with by either an incident response team (IRT), an incident management team (IMT), or Incident Command System (ICS). Without effective incident management, an incident can disrupt business operations, information security, IT systems, employees, customers, or other vital business functions

2.1 Physical incident management

National Fire Protection Association states that incident management can be described as, '[a]n IMS [incident management system] is "the combination of facilities, equipment, personnel, procedures and communications operating within a common organizational structure, designed to aid in the management of resources during incidents"'.

The physical incident management is the real time response that may last for hours, days, or longer. The United Kingdom Cabinet Office have produced the National Recovery Guidance (NRG), which is aimed at local responders as part of the implementation of the Civil Contingencies Act 2004 (CCA). It describes the response as the following: "Response encompasses the actions taken to deal with the immediate effects of an emergency. In many scenarios, it is likely to be relatively short and to last for a matter of hours or days – rapid implementation of arrangements for collaboration, co-ordination and communication are, therefore, vital. Response encompasses the effort to deal not only with the direct effects of the emergency itself (eg fighting fires, rescuing individuals) but also the indirect effects (eg disruption, media interest)".

International Organization for Standardization (ISO), which is the world's largest developer of international standards also makes a point in the description of its risk management, principles and guidelines document ISO 31000:2009 that,

"Using ISO 31000 can help organizations increase the likelihood of achieving objectives, improve the identification of opportunities and threats and effectively allocate and use resources for risk treatment". This again shows the importance of not just good planning but effective allocation of resources to treat the risk.

2.2 Root Cause Analysis

During the root cause analysis, human factors should be assessed. James Reason conducted a study into the understanding of adverse effects of human factors.[10] The study found that major incident investigations, such as Piper Alpha and Kings Cross Underground Fire, made it clear that the causes of the accidents were distributed widely within and outside the organization. There are two types of events: active failure—an action that has immediate effects and has the likelihood to cause an accident—and latent or delayed action—events can take years to have an effect and are usually combined with triggering events that then cause the accident.

Latent failures are created as the result of decisions taken at the higher echelons of an organisation. Their damaging consequences may lie dormant for a long time, only becoming evident when they combine with local triggering factors (e.g., the spring tide, the loading difficulties at Zeebrugge harbour, etc.) to breach the system's defences. Decisions taken in the higher echelons of an organization can trigger the events towards an accident becoming more likely, the planning, scheduling, forecasting, designing, policy making, etc., can have a slow burning effect. The actual unsafe act that triggers an accident can be traced back through the organization and the subsequent failures can be exposed, showing the accumulation of latent failures within the system as a whole that led to the accident becoming more likely and ultimately happening. Better improvement action can be applied, and reduce the likelihood of the event happening again if this arrangement is totally robotized, it finds the crisis vehicle spot, controls the traffic lights. This system controls the traffic lights and saves the time during emergency periods.

3. INCIDENT RESPONSE

Sequence of immediate response actions:

- All incident should have immediate correction or action
- Provide first aid to injure or ill health persons.
- Based on the first aid response, if required shift him to nearest hospital
- If dangerous occurrence call security to coordinate access for emergency services on campus.
- Any near miss

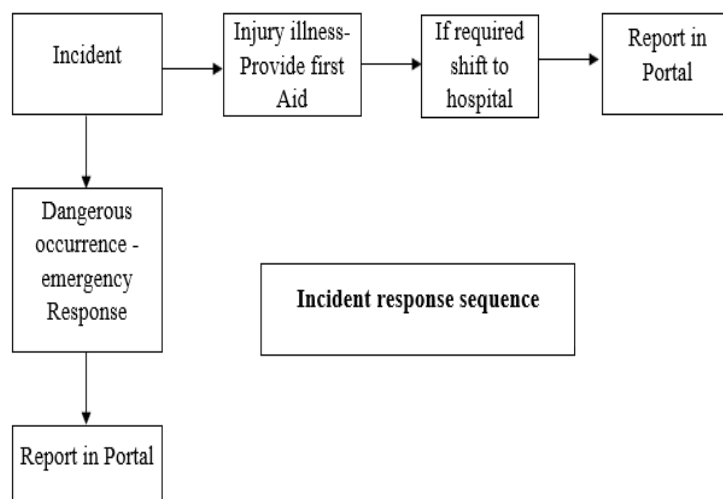


Figure 3.1 Incident Response Sequence

3.1 Incident Investigation

All reported incidents. Required to commence investigation within 24 hours or as soon as reasonably practicable.

If it is necessary to conduct an on-site investigation, a team should be authorized to do the investigation. this team may include the following participants:

- LR and MA (EHS Head)
- Persons involved in the incident and witnesses

- Health and Safety Core team (if reasonably practicable)
- Security

The incident investigation team shall establish the facts of circumstances leading up to the incident, during the incident and post-incident by gathering and considering information including:

- Evidence from the site from inspections and observations, photos and sketches
- Discussions with persons involved (or those aware of possible contributing factors) and statements from witnesses
- Materials, equipment chemicals and substances involved
- Exact location and environmental conditions including lighting, weather, ventilation, floor conditions
- Exact time, date and other time factors, eg. shift changes, rest breaks, task duration, work time frames and deadlines

Unusual sequence of events and actual sequence of events, before, during and after the incident.

Due date for completion of planned corrective actions. The LR and MA (EHS Head) if required, shall also assess if any employee/ support staff, injured as a result of the incident needs to take time off work.

4.KELVIN TOPSET METHOD

Root Cause Analysis (RCA) is one of the most commonly misunderstood terms worldwide. Many companies and individuals request Root Cause Analysis training when what they actually want is a comprehensive accident investigation system. Kelvin TOP-SET provides this system, and the RCA is only part of this package.

The RCA is part of the reporting procedure. It is a logic flow diagram, summarizing the events and failures uncovered in the investigation, and linking the incident through Immediate and Underlying Causes to the Root Cause(s) of the problem. As a consequence, the RCA should only be started when an investigation is completely finished.

For various reasons, an Investigator may be encouraged to come up with an RCA and make recommendations, based on limited information. We have all heard the phrase, “We all know what has happened here”, and the temptation is to make the RCA fit this early conclusion. To achieve this would require the Investigator/Team to ignore other areas where problems may lie, and perhaps even to ignore evidence simply to make things fit the early diagnosis.

The Kelvin TOP-SET system is a straightforward and user-friendly incident investigation system which is scalable for all levels and types of incidents – from minor, non-lost-time incidents such as slips, trips and falls to major catastrophic incidents such as oil spills and explosions the Traffic signal was changed corresponding to this information.



Figure 4.1 Kelvin Top set

5.HIERARCHY OF CONTROL

The hierarchy of control is a system for controlling risks in the workplace. The hierarchy of control is a step-by-step approach to eliminating or reducing risks and it ranks risk controls from the highest level of protection and reliability through to the lowest and least reliable protection.

Eliminating the hazard and risk is the highest level of control in the hierarchy, followed by reducing the risk through substitution, isolation and engineering controls, then reducing the risk through administrative controls. Reducing the risk through the use of protective personal equipment (PPE) is the lowest level of control.

The following element shows the structure of the hierarchy of control, from most effective control to least effective

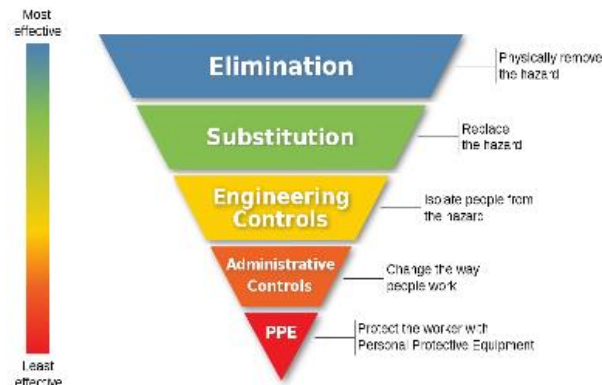


Figure 5.1 Hierarchy of Control

5.1 Elimination

Physical removal of the hazard is the most effective hazard control. For example, if employees must work high above the ground, the hazard can be eliminated by moving the piece they are working on to ground level to eliminate the need to work at heights

5.2 Substitution

Substitution, the second most effective hazard control, involves replacing something that produces a hazard with something that does not produce a hazard or produces a lesser hazard. For example, replacing lead-based paint with titanium white. To be an effective control, the new product must not produce unintended consequences. Because airborne dust can be hazardous, if a product can be purchased with a larger particle size, the smaller product may effectively be substituted with the larger product

5.3 Engineering Controls

The third most effective means of controlling hazards is engineered controls. These do not eliminate hazards, but rather isolate people from hazards. Capital costs of engineered controls tend to be higher than less effective controls in the hierarchy, however they may reduce future costs. For example, a crew might build a work platform rather than purchase, replace, and maintain fall arrest equipment. "Enclosure and isolation" create a physical barrier between personnel and hazards, such as using remotely controlled equipment. Fume hoods can remove airborne contaminants as a means of engineered control

5.4 Administrative Controls

Administrative controls are changes to the way people work. Examples of administrative controls include procedure changes, employee training, and installation of signs and warning labels (such as those in the Workplace Hazardous Materials Information System). Administrative controls do not remove hazards, but limit or prevent people's exposure to the hazards, such as completing road construction at night when fewer people are driving

5.5 Personal Protective Equipment

Personal protective equipment (PPE) includes gloves, Nomex clothing, overalls, Tyvek suits, respirators, hard hats, safety glasses, high-visibility clothing, and safety footwear. PPE is the least effective means of controlling hazards because of the high potential for damage to render PPE ineffective. Additionally, some PPE, such as respirators, increase physiological effort to complete a task and, therefore, may require medical examinations to ensure workers can use the PPE without risking their health

6. GRI 403: OCCUPATIONAL HEALTH AND SAFETY

The GRI Standards enable any organization – large or small, private or public – to understand and report on their impacts on the economy, environment and people in a comparable and credible way, thereby increasing transparency on their contribution to sustainable development. In addition to reporting companies, the Standards are highly relevant to many stakeholders - including investors, policymakers, capital markets, and civil society.

The Standards are designed as an easy-to-use modular set, delivering an inclusive picture of an organization's material topics, their related impacts, and how they are managed.

- The **Universal Standards** - now revised to incorporate reporting on human rights and environmental due diligence, in line with intergovernmental expectations - apply to all organizations;

- The new **Sector Standards** enable more consistent reporting on sector-specific impacts;
- The **Topic Standards** - adapted to be used with the revised Universal Standards - then list disclosures relevant to a particular topic.

6.1 Disclosure 403-9 Injury Rate

calculate the rates based on either 200,000 or 1,000,000 hour worked, using the following formulas:

Rate of fatalities as a result of work-related injury	=	$\frac{\text{Number of fatalities as a result of work-related injury}}{\text{Number of hours worked}} \times [200,000 \text{ or } 1,000,000]$
Rate of high-consequence work-related injuries (excluding fatalities)	=	$\frac{\text{Number of high-consequence work-related injuries (excluding fatalities)}}{\text{Number of hours worked}} \times [200,000 \text{ or } 1,000,000]$
Rate of recordable work-related injuries	=	$\frac{\text{Number of recordable work-related injuries}}{\text{Number of hours worked}} \times [200,000 \text{ or } 1,000,000]$

Figure 5.2 Rate of Injury as per GRI

7. SOFTWARE REQUIREMENTS

7.1 MS Forms

Microsoft Forms (formerly Office Forms) is an online survey creator, part of Office 365. Released by Microsoft in June 2016, Forms allows users to create surveys and quizzes with automatic marking. The data can be exported to Microsoft Excel

With Microsoft Forms you can create a form, such as a survey or quiz, invite others to respond to it using almost any web browser or mobile device, see real-time results as they're submitted, use built-in analytics to evaluate responses, and export results to Excel for additional analysis or grading.



Figure 7.1 MS forms logo

7.2 MS Outlook:

Microsoft Outlook is an email application that includes a calendar, contacts, and task manager. Outlook is the official communication avenue for the College for all faculty, staff, and administrators. Any College-related communications should be conducted using Outlook. Within the application you can create folders to easily organize your communications for future reference and keep your calendar up-to-date to ensure you don't miss any deadlines.

- Organize email to let you focus on the messages that matter most.
- Manage and share your calendar to schedule meetings with ease.
- Share files from the cloud so recipients always have the latest version.
- Stay connected and productive wherever you are
-

**Figure 7.2 MS Outlook logo**

7.3 Power Automate

Microsoft Power Automate is all about process automation. Power Automate allows anyone with knowledge of the business process to create repeatable flows that when triggered leap into action and perform the process for them.

Microsoft Power Automate (formerly Microsoft Flow) is used to automate the repetitive business processes that help us to create automated workflows between our Favorite apps and services to synchronize files, get notifications, collect data.

It is a completely cloud-based automation program that unlocks the analogue data with AI (Artificial Intelligence), automates UI (User Interface) with RPA (Robotic Process Automation). It automates cloud-based applications and databases with built-in connectors.

Expansion of RPA technology in power automation with a new desktop-based solution, called Microsoft Power Automate Desktop. Power Automate is a unified platform with API & UI-based automation for Enterprise customers. It provides a new feature with RPA capabilities called UI-flows. It enables the creation and automates workflows and tasks across multiple applications and services without help from developers.

Power Automate can connect to external data sources via one of the hundreds of connectors or directly via an API. Beyond simple workflows, Power Automate can send reminders on past tasks, move business data between systems on a schedule. It allows you to easily integrate with other applications or services through connectors.

**Figure 7.3 Power automate logo**

7.4 Share point

SharePoint is a platform to support collaboration and content management system. It is a central web-based portal. Using SharePoint, you can manage your colleague's and your own documents, social activities, data, and information.

SharePoint is also a platform that supports not only interoperability and collaboration but also extensibility, through a rich object model, a solid set of developer tools, and a growing developer community.

SharePoint is a collaboration and content management platform on which multiple users can simultaneously store, share, and edit documents. A web interface is provided for all Microsoft SharePoint and Microsoft SharePoint Online users. If you prefer to use a command line interface to manage SharePoint software, SharePoint Online PowerShell cmdlets are provided for this purpose. Organizations use SharePoint when functionality of traditional file servers and shared resources (available via SMB or NFS protocols, for example) is not enough. SharePoint Online is a cloud-based version (runs in Microsoft data centers) of SharePoint Server (runs in local data centers). All maintenance tasks are performed by Microsoft and updates are installed automatically when they become available. SharePoint Server and SharePoint Online features are almost identical

**Figure.7.4 MS Share point logo**

8.DIGITALIZED INCIDENT MANAGEMENT SYSTEM

In organization, the Incidents are not reported, however the incident occurred on daily basis due to incidents not reported and reviewed on properly

8.1 Main Reasons for lack of incident reporting

- Reporting a near miss can also be uncomfortable for an employee. Sometimes, they feel they have to choose between being honest about what happened, and dealing with the judgement and criticism of their peers and superiors
- One of the most common reasons people don't speak up when a workplace incident occurs is because they are

afraid – their fear is of the unknown. Employees don't know what the repercussions will be if they report the incident, and they worry that this action might bring some kind of punishment.

- Sometimes, employees can get so caught up in their day-to-day responsibilities, they might even forget that reporting risks and incidents is one of them too.

8.2 New Methodology Flow

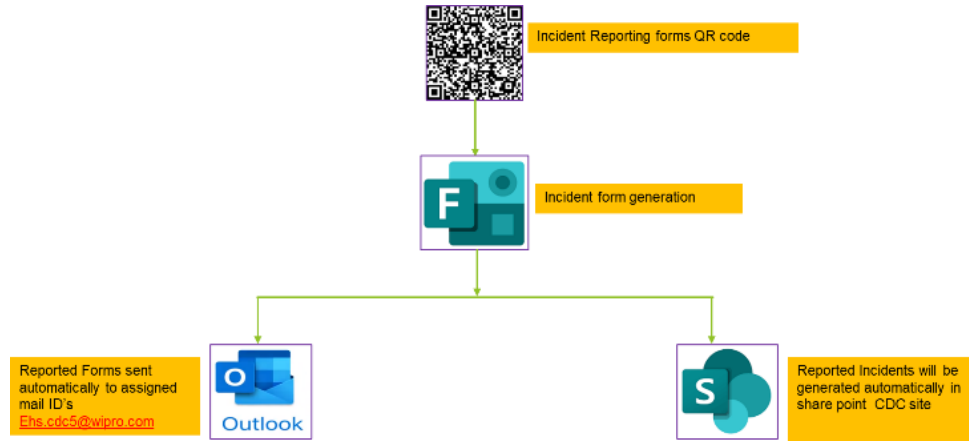


Figure 8.2 New Methodology Incident Reporting

- QR code will be displayed at all towers common areas
- Easily accessible to report all EHS incident
- Incident tracking
- Link will be shared in location Watzup group and Supervisors /FE's are responsible for reporting

8.3 EHS Incident Reporting Forms Mobile View

Safety Begins With Team Work

* Required

1. Site Name *

☒ Wipro CDC-2

☐ Wipro CDC-3

☐ Wipro CDC-5

☐ Wipro CDC-7

2. Date / தேதி *

Please input date (M/d/yyyy)

3. Time / நேரம் *

Enter your answer

Figure 8.3 Incident Reporting form Mobile view

4. Incident Type / நிகழ்வு வகை

[More Details](#)
[Insights](#)

Nearmiss	92
Unsafe condition / பாதுகாப்ப... 19	19
Unsafe act / பாதுகாப்பற்ற ... 7	7
Fire alarm	12
First aid	0
Lift Stuck	2
water Seepage & False ceiling	2
illness	0
Other	5

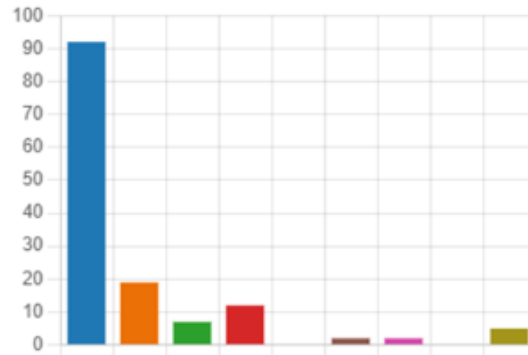


Figure 8.4 Incident reporting tracker

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