

Improving safety management

Case Background

An accident occurred in a manufacturing plant producing a variety of human and animal health products, resulting in a serious injury being sustained by a maintenance engineer, who sustained a high-voltage electric shock whilst working in a designated hazard zone along with others in the maintenance crew, who were unharmed.



The company hitherto had an exemplary safety record, having experienced no significant safety-related incidents over a period of some 5 years of operation. The company has stringent safety training and risk assessment procedures, and their management team have justifiable pride in their attention to all aspects of their safety at work commitments, so this event caused much consternation throughout the organisation.

Investigations by the company and HSE inspectors as to the cause of the accident subsequently revealed that the incident directly resulted from failure to ensure that properly instigated electrical isolations were in place prior to the issue of appropriate permit-to-work authorisation. Furthermore, three different permits were inadvertently issued to three of the crew undertaking different individual tasks in the same zone - there was a shift changeover at that time, so this deficiency was not noticed.

Consequently, because the nature of the work required specific tasks to be performed in a pre-determined sequence to comply with the company's maintenance and Standard Operating Procedures, work was started on the second phase of the operation before completion and sign-off authorisation of the first, thereby causing a breach of the intended safety at work protocol. Therefore, the discipline required to enable the prevention of conflict of the issue of permits was absent, and this deficiency failed to provide the necessary operational safeguards, with the resultant outcome.

Conclusions reached:

- Although most accidents are usually preventable, the paper-based permit-to-work system in place was inherently incapable of preventing such an incident
- The reliance on a paper-based system involving the complexity of synchronizing and coordinating many different permit types, certificates and associated PPE, MSDS and SOP documentation is cumbersome and almost impossible to assign and manage effectively
- Visibility and verification of the whole process is lacking, with managers often unable to easily see an accurate picture of the status of a permit's progress
- There was no discernable 'end-to-end' Audit trail of current and historical permit activity
- There was much uncertainty relating to the examination/risk assessment of the work to be carried out. This assessment was not carried out at source. This was a major contributor to the accident
- There was no conflict identification capability between permits. This was a significant factor leading to the events preceding the accident
- There was no verification assurance that all sections of the permit were correctly completed
- Approved mechanical and electrical isolation processes were overlooked. This oversight contributed to the accident
- There was no permit condition alert/notification capability in place that was consistent with the hazardous nature of the work environment and the tasks being performed

- The system was unable to deliver real-time monitoring of the status of all of the active permits
- The ability to access and examine current and historical paper permits was time-consuming and extremely difficult to achieve
- There was no identification, cross-referencing or synchronisation of the potential hazards analysis as part of risk assessment

The following table illustrates the possible costs likely to be incurred at this site as a result of a single incident described above:

Estimated incident costs:

Overview	Detail	Cost	£
Accident resulting in non-fatal injury	Employee electrocuted with 1 st & 2 nd Degree burns, leading to 12 weeks off work	N/a on payroll	N/a on payroll
Additional resource/overtime	Cover for the person injured in the accident	12 weeks at £650/week	7,800
Production shutdown	Loss of 200 Kilos production output for 5 days.	200Kgs at £4,000/Kg.	800,000
Internal Investigations	4 x FTE's (safety, production, maintenance, plant management, etc) for 3 days	Average £200/day/person	2,400
External Investigations	HSE plus at least 2 internal employees (safety and plant management) for 2 days	Average £200/day/person	800
Loss of normal day-to-day activities during investigation	Internal and external investigations carried out by 4 people x 5 days	Average £200/day/person	4,000
Potential internal cost impacts	Settlements, tribunal awards, etc.	Average £10,000	10,000
Potential external cost impacts	HSE and other breach of compliance fines	Average £25,000	25,000
Potential indirect cost impacts	Adverse publicity, legal fees, increase in insurance premiums, etc.	Unknown	Unknown
Total estimated incident costs			£850,000

Notes

- The above is based on a reportable accident that caused a production shutdown. In other cases where an accident does not result in a shut down, an average cost of £50,000-£60,000 per accident is incurred
- In other cases many "incidents" that are not necessarily reported and/or do not cause a production shutdown, incur an average cost of £6000-£10,000 per incident

"More than just the most advanced electronic permit to work system available, PCMS is an important component of any organisation's corporate governance and HSE policy framework"

Adoption of aSap's **PCMS**[©] electronic permit to work system provides some of the following functions, attributes and benefits to ensure best practice **Safe System of Work** being established and maintained. The system harnesses the power of modern technology to deliver an unprecedented level of effectiveness to provide:

- Improved and more energised overall integrity of safety operations and behaviour
- More robust and disciplined compliance with relevant SOP and EHS directives
- Greater ability to disseminate accurate and timely information throughout the organisation
- Greater visibility and accountability of safety procedures
- The ability to interrogate the status of Risk Assessment and permit-to-work issues in real-time, anytime, from anywhere
- Unadulterated, unambiguous and error-free permit-to-work trace-ability and audit trail
- The examination and risk assessment of work to be carried out at source
- The immediate identification of conflicts between permits
- Precise identification of permit locations using tabular or pictorial plant layout
- Assurance that all sections of the permit have been correctly and fully completed
- The identification and capture of detailed requirements for mechanical and electrical isolations
- Immediate access to MSDS to enable appropriate PPE to be assigned
- Interfaces with other MMS, ERP and management information systems
- Instant alerts and notifications based on severity of tasks being performed
- Dynamic real-time monitoring of the status of all active permits
- Gives immediate access to all current and historical permits
- The identification of the hazards analysis as part of risk assessment
- A powerful workflow mechanism ensuring correct in-house safety procedures are always followed
- A scalable and extensible solution to suit the needs of any size of company, for single site, multiple site or trans-national operations

Furthermore, in any incident and/or accident investigation, **PCMS** has a variety of reporting and audit trail functions available to enable speedy access to information and produce required factual evidence, without the need to go through the painstaking process of locating and collating many different documents that may or may not still exist. This saves a great deal of time and effort and is far more efficient than is possible with a paper-based system.

"PCMS substantially raises the company's effectiveness across the whole spectrum of safety management procedures"