SAGE TECHNOLOGY

The Safety Document Fallacy

White Paper

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Addressing the issues and risks associated with focusing on safety documents when selecting electronic Permit to Work solutions

Executive Summary

Organisations seeking to implement a Permit to Work system often become focused on the documents and what they look like rather than on the proven method of increasing safety through improved process. Many companies even use the words '*Safety Document'* in their system specifications. Yet documents, even so-called Safety Documents, do NOT result in improved workplace safety, in fact, far from it. If simply filling out forms was the answer to creating a safe workplace then workplace fatalities and injuries would have become a thing of the past many, many years ago.

So why is there such insistence on Safety Documents as a solution? These are simply documents that list a series of safety related actions and checks that must be completed in order to make an item of plant safe for personnel to perform work on. So-called Safety Documents may describe the safe work process but they do not and cannot enforce it. Therein lies the fallacy of Safety Documents – it is not the documents themselves but the SAFE WORK PROCESS that creates a safe work environment.

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It is widely accepted that multiple activities, including risk assessments, isolation schemes, and approvals, must occur before personnel can work safely on equipment. These activities may range from the simple erection of barricades through to complex mechanical or electrical isolations of plant and Confined Space access. However, paperwork can only document these activities. It cannot enforce safe work process. Technology can. And this same technology can be used to generate the necessary paperwork at the appropriate stages in the safe work process.

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This White Paper will unveil the Safety Document fallacy and outline the elements of good process that provide the foundation of a safe system of work.

The Safety Document Fallacy

The majority of plant access safety, control of work, work clearance or permit systems remain paper-based. These paper-based systems require extensive supporting procedures, forms, authorisation records and training to provide a safe working environment. Some software vendors provide basic technology to digitise the recording of some of this information but these are in reality little more than a permit register or database because the permit process remains heavily reliant on the paperwork being properly managed by people.

In this respect, Safety Document systems may deliver some time savings. In fact, an oft-cited claim of Safety Document systems is that they save time by allowing the reuse of permits through the replication of the safety document. However, there is no checking process to identify whether all of the parameters of the previous permit still apply to the new permit or even whether any lessons learned from the previous permit have been captured. Replicating the paper without proper checks is a very effective way of creating a dangerous situation!

The goal of any permit-to-work or safe system of work must be to make it easy to do the right thing.

So-called Safety Documents may describe the safe work process but they do not and cannot enforce it. Safety Documents are merely a checklist of the safety related actions and checks required in order to enable access to the plant in a safe manner. This means that the checklists, and the actions prescribed in the checklists, can be completed at any stage during the process – even after the work is completed i.e. retrospectively.

The Safety Document approach has no inbuilt safeguards to prevent personnel from skipping or ignoring steps and there is no audit record to prove what actions were taken, when or by whom. As we all know, humans are fallible and can easily forget (or even intentionally avoid) an activity, regardless of how important it is, particularly in the face of operational pressures. Effective Permit to Work and isolation processes require a range of appropriate approvals, checks and balances but, as this White Paper has already shown, a Safety Document system cannot ensure that these critical steps are implemented at the right point and by the appropriately authorised personnel. In fact, Safety Document systems cannot ensure or prove that these steps have even been undertaken.

Another significant risk with paper-based permit systems and Safety Documents is the lack of visibility that these systems are able to provide to all personnel, not just the people who have prepared the permit. A classic and tragic example where the visibility of the "Safety Document" contributed to a significant incident was the Piper Alpha Disaster in 1988. Two separate permits relating to the same item of plant were stored in different locations. One of these permits could not be found in a time-critical situation which resulted in the item of plant being put back into service when it was not safe to do so. A total of 167 lives were lost.

The ability to see or find a piece of paper, even a Safety Document, should NEVER be the sole mechanism for ensuring the safety of a work party or plant. If safety depends on a piece of paper then the risk of incidents is significantly higher.

An undesired and unwelcome effect of focusing on the documents rather than enforcement of process is that it may result in needlessly revisiting and revising Permit to Work procedures time after time without achieving the desired safety, efficiency and risk reduction benefits. Not only is this approach a waste of time, but it is likely to lead to different types of permit breaches and potentially life threatening incidents while personnel become confused and disillusioned with the whole process.

The question which organisations should focus on when seeking to implement a new Permit to Work system is how can they create and enforce a safe workflow around the Permit to Work process that is less dependent on people, their individual skills and knowledge. Surely this outcome is a reassuring thought for those responsible for this important aspect of work. Imagine if we still relied on moving signed pieces of paper between us and financial institutions for every transaction as we used too! Perversely, we take the benefits of automation for granted in some areas yet perceive it to be too difficult to achieve in others.

Unveiling the Safety Document fallacy highlights the importance of removing the emphasis on the paper and instead places the emphasis where it should be - on implementing a Permit to Work system which enforces safe workflows.

Person versus Process Paradigm

As shown above, the inherent weakness of paper-based and Safety Document Permit to Work processes is that they are much too person-centric. All too often the process calls for a person to undertake large portions of the Permit to Work process in a single action (with various approvals interspersed). This creates an environment which is ripe for dangerous errors through interruptions and distractions, not to mention the high level of dependency on the knowledge, memory and skills of a single person.

Often these people are operations or production personnel who also have other important responsibilities. i.e. operational issues which will have priority over any permit activities. This can result in permits being left in various levels of incompleteness, which is undeniably a recipe for disaster or at least an increased risk profile, particularly during busy periods such as a breakdown or shutdown.

Truly robust, consistently repeatable PTW processes reduce the human element as much as possible. Technology can play a vital role in delivering

these processes. Obviously this is not a new concept as we use technology to support all sorts of business processes from work orders to our personal and business banking. It is surprising then that with all the technology automation we have available in plant operations and business activities that Permit to Work has been left as a manual paper process for so long.

In fact, the paperwork generated by a manual or even a Safety Document process is almost the last thing that is needed before work commences safely on the plant. Let's explore the various aspects of how this safe work can be achieved.

Best Practice Safe Work Process

While procedures and business rules must be documented, technology can be used to reduce the human error factor in the implementation of these procedures.

The following sections will discuss elements of best practice in Permit to Work processes. These are based on the author's experience from site visits and interviews, reviews of policies/procedures and his experience in the analysis of procedures for the purpose of implementing workflow process-driven electronic Permit to Work systems.

Every site or facility has its strengths and its weaknesses. Many of these businesses keep reviewing and trying to refine their procedures and forms, yet problems remain or new ones arise. Personnel at these sites report that they feel like they are chasing their tail and are often left wondering what will go wrong next!

Typically there is insufficient review and benchmarking against industry best practices or even what other facilities or industries are doing. In other words too much time and effort is spent reinventing the wheel. There is also a distinct lack of standards to guide these organisations but that is another topic! The most common way of sharing good ideas and practices between sites is when personnel change organisations - a useful means of disseminating information but not a reliable method of improving practice!

Permit Workflow

The core elements of Permit to Work (PTW) or Integrated Safe System of Work (ISSoW) workflows can be lost in the documentation of highly complex procedures. I often see procedures of 100 or even more pages long and the fact is that no one can remember that much information, especially for uncommon or infrequently performed activities. ***The goal of any Permit to Work or safe system of work must be to make it easy to do the right thing***. Requiring personnel to learn and remember a 100+ page procedure is not the way to achieve that. No doubt I have offended many well meaning people who have put many dedicated hours into writing these procedures. However, the key message here is that while procedures and business rules must be documented, technology can be used to reduce the human error factor in the implementation of these procedures.

The high level permit work flow should be basic and easy for personnel to remember. The specific needs of more complex permits can be triggered and enforced via technology and with prompts for specific actions to be performed by personnel with the specific knowledge/expertise and authorisation.

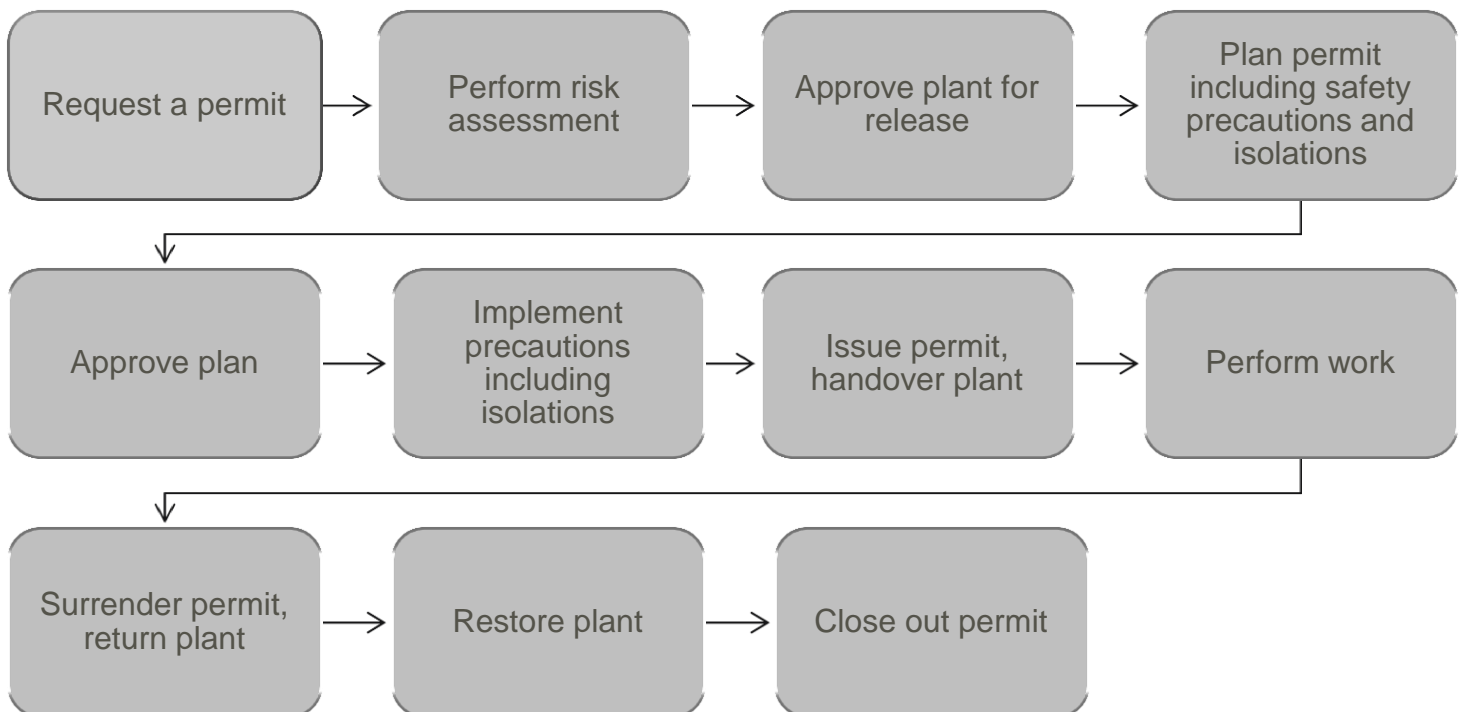The basics of the Permit to Work process can be as simple as this:

Figure One: Basic Permit Workflow Process

Process Checkpoints

Process checkpoints are the windows of review and approval required to provide the necessary safety checks and balances at various points in the Permit to Work lifecycle. Most sites have at least two levels of checkpoints but some even allow personnel to issue a permit to themselves without any such checks or balances. There are arguments as to why this should be allowed for minor work but I would not like to try and defend this in court following an accident!

The following questions can be used to consider the existence and purpose of checkpoints. In some scenarios, checkpoints can be combined, provided the original rationale of the checkpoint is not lost.

- Has the maintenance activity been approved?
- Is the work request adequately described?
- Is the applicant authorised for the type of permit requested?
- Have the appropriate risk assessments been completed?
- Have the risk assessments been approved?
- Can the plant be released for work at the requested date/time?
- Does the work request conflict with other current or other planned work?
- How are plant hazards identified/known?
- Has the permit plan, including isolations, been approved/checked?
- How are isolation conflicts identified/prevented?
- Have the isolations been validated/checked by an authorised person to prove and validate the correct points are isolated?
- Have all the supporting authorisations been approved? e.g. radiation, HV etc
- Is the person issuing the permit authorised for the permit type and plant area?
- Is the person/s receiving the permit authorised for the permit type and plant area?
- Is the issuer prevented from issuing a permit to themselves?
- Is the person surrendering the permit the same person to whom it was issued?
- How are shared isolations prevented from being restored ? (lockout & tagout)
- How are new potential work conflicts prevented?
- Are isolations confirmed as being removed?

These process checkpoints identify a number of the authorisation requirements of the Permit to Work process.

Examples of the types of authorisations that exist in many plants include:

- Permit requester (often a maintenance person)
- Asset/area owner (to approve release of plant)
- Permit holder (often the same person as the requestor and may be restricted by plant area and/or permit type)
- Authorised plant isolator (also may be restricted by plant area and permit type)
- Authorised permit issuer (also may be restricted by plant area and permit type)

- Specialist authoriser e.g. radiation certificate
- Proxy authoriser

Paper-based and Safety Document systems require the names and signatures of authorising personnel to be recorded, however, these systems offer no process for the validation of these names and signatures. Nor is it possible to determine when the authorisation occurred as it is not possible to independently record and verify the time and date of signatures in such paper-based systems. In fact, the potential for and risk of fraudulent misuse of signatures is considered so significant by financial institutions that credit card suppliers are replacing the use of signatures with electronic PINs.

Workflow process-based PTW software systems ensure that authorisations are carried out at the appropriate time in the process by properly authorised personnel.

On the other hand, a workflow process-based PTW software system ensures that authorisations are carried out at the appropriate time in the process by properly authorised personnel. These types of systems are capable of managing different business rules for different permit/certificate types and actually prevent personnel from progressing permits to work until these authorisations are in place. Additionally, they will automatically build an audit trail of all actions which can be reviewed as required.

An Alternative Approach

The limitations and risks of Safety Document systems have been clearly outlined in this White Paper and a safer, alternative approach, a workflow-driven software system has been suggested.

These types of systems can address the issues identified in this White Paper as follows:

Issue/Risk of Safety Document approach	Software benefit
Describes safe work process but unable to enforce	*Safe work process enforced.*
Risk of creating dangerous situation through the uncontrolled reuse of permits	*Template approach to reuse of standard isolation checklists for repeat work subject to checks and approvals enforced by the system*
Significant risk of human error	*Virtually eliminated by reducing the reliance on a person's knowledge of plant and procedures*
Limited visibility of permits/certificates, isolations and their current status	*Full visibility can be made available to all personnel with network access to the system, even without logging in*
Unable to ensure authorisations occur at the proper stage in the process and by the proper person/s	*Enforced by systems which prevent permits from being progressed unless authorisations have been done by appropriately authorised people, as validated by the system*
Relies on personnel fully understanding different requirements of different permit types	*System can manage and enforce different workflows and business rules for different types of permits/certificates*
Not auditable	*Audit trail automatically generated with date and timestamps, record of steps taken and by whom*
Emphasis on customisation and generation of safety documents	*Customisation and generation of safety documents at the appropriate stage within the safe workflow process*

Conclusion

This white paper has unveiled the Safety Document fallacy. It has shown that a digitised version of a paper form, even one called a Safety Document, can create the false illusion of one without actually improving safety. Some commercial PTW packages make a big deal of being able to customise the layout of the permit or save time through the reuse of permits but these factors do not equate to safe work processes. As this White Paper has clearly demonstrated, permit to work safety must be underpinned by effective safe work process, not a Safety Document.

A safer approach is to focus on the ability of technology to enforce process, manage checkpoints and approvals, create an audit trail of actions, generate the required documentation at the appropriate stages, and virtually eliminate the risk of human error.

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Peter has an extensive practical working history in the electricity industry and has worked as a business technology consultant on projects such as IT strategies, reviews, audits and implementation project management.

He has a strong knowledge and understanding of Permit to Work, safe system of work, isolation management and lockout tagout practices. Peter consults with clients to deliver Gap Analysis Reports to ensure a solid fit between Sage Technology's safe work systems and our client's current or desired practices.

He is in demand as an electronic PTW expert and is actively involved in the ongoing development of Sage Technology's safe work software systems.

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