



SAGE TECHNOLOGY

# When Paper Permit to Work (PTW) Protection Wears Thin

White Paper

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*Understanding the risks of delaying the implementation of electronic Permit to Work and Integrated Safe Systems of Work in complex plant*

## Executive Summary

Permit to Work practices are essential to provide safe working environments in plant and industrial sites throughout the world. Although the technology and complexity of the equipment governed by PTW systems has developed significantly in recent years, those PTW systems have not always kept pace.

Computerised maintenance management systems are now embedded in industry, yet those same organisations continue to use manual or paper-based processes for their Permit to Work activities. This anomaly continues because many organisations believe they must get their paper-based manual PTW systems right before progressing to an electronic system.

**This White Paper addresses the key issues which should be considered in deciding whether to concentrate efforts on upgrading manual processes before making the transition to an electronic system. It will also examine the immediate advantages which can be achieved through a single step improvement via the adoption of an Integrated Safe System of Work incorporating Permit to Work, Isolation and Risk Management.**

*“The manual-first approach can leave your business open to a range of risk factors...”*

Key decision makers in complex plant often want to review and implement updated manual permit processes before considering an e-PTW system. However, experience suggests this is not necessarily in the best interests of industry and may even contribute to high levels of wastage, additional costs and increased risk for personnel and plant.

The manual-first approach can leave organisations open to a range of risk factors which should be carefully weighed before going down this path. These risks include:

- Non-compliance with the permit process
- Isolation conflicts and permit breaches
- Lack of integration and visibility between the safety critical practices of Permit to Work, Isolation and Risk Management
- Wasted effort in writing permits and tags by hand, and risks associated with illegible handwriting
- Inefficient permit planning
- Delays in returning plant to service after outages
- Personnel time to relearn PTW process
- Lack of auditability
- Difficulties finding suitable off-the-shelf software after a manual process is established

## Permit Process Compliance

**Manual PTW processes, by their very nature, allow personnel to perform the permit preparation, issue and surrender activities with a high degree of flexibility.** However, such flexibility also allows for steps to be overlooked or skipped, substantially increasing the risk of incidents occurring. Higher levels of compliance are now required to meet Occupational Health and Safety regulations, and all processes must be sound and defensible.

All Permit to Work processes require certain activities to be completed in a pre-determined safe sequence before moving on to the next step. This is a key requirement if the PTW process is to provide a safe working environment and meet compliance requirements. However, manual processes cannot enforce this sequence of steps and therefore constitute a significant risk for organisations.

*“Electronic safe work systems prevent personnel from taking shortcuts or moving outside the approved process.”*

Generally speaking, electronic safe work systems enforce the sequence of events and provide the highest levels of certainty and safety for personnel preparing and receiving permits. Electronic PTW systems prevent personnel from taking shortcuts or moving outside the approved process. All actions in the permit lifecycle are recorded in an electronic audit trail. This encourages personnel to follow proper, safe procedures and results in a highly defensible process that has been proven safe, efficient and effective in complex plants. This level of auditability simply cannot be matched by manual processes.

## Permit Planning

**Planning is a critical step in managing Permit to Work and related activities. Poorly planned permits can lead to unsafe isolations which can in turn put your personnel and plant at risk. The manual process is also susceptible to variations in risk assessments and other factors, especially when inexperienced planners are not familiar with the plant and either take longer to plan permits or make dangerous mistakes.**

On the other hand, Integrated Safe Systems of Work can:

- Streamline the planning process
- Ensure that all required information is provided
- Apply a level of consistency across hazard identification and risk management
- Determine the required permits and certificates
- Improve isolation management

Many organisations already have and use lists of standard isolations for tasks which are performed regularly on the same item of plant. However, *manual* processes cannot ensure that these lists are regularly reviewed and approved

for use. Nor can they improve the cross referencing required to ensure that potential conflicts are identified and managed.

Electronic systems, however, can store and manage templates of such standard isolation lists and ensure that they are properly reviewed and approved before they are used. Such systems also perform continuous and exhaustive cross referencing and ideally prevent tags from being printed and permits from being issued if a potential conflict is identified.

## Permit Breach Risk

**Isolations must be cross-referenced to identify and prevent conflicts before they occur and to ensure that plant and people are protected at all times.**

Manual permit processes are typically limited to the knowledge and care of the person/s preparing the permit. The risk of human error is always present. This risk increases when comparisons of multiple permits and isolations are needed in a busy, complex plant.

Manual cross referencing is a high risk step. As a minimum, a large, printed cross reference chart is needed to track the inter-relationships between permits and their isolations. Failing to update just one isolation point exposes personnel to the risk of a conflict and the potential for a permit breach to result.

On the other hand, electronic safe work systems which integrate PTW and isolation management should automatically and rigorously cross reference work requests, permits, certificates and isolations to automatically identify and highlight shared plant items and isolations. Such systems warn of conflicts and prohibit the printing of tags and thus the issue of permits, providing a level of protection that cannot be matched in manual systems and, better still, require no extra operator effort to achieve.

Electronic systems can also be used to manage Simultaneous Operations (SIMOPS) by plotting the location of work parties and generating conflict warnings when hazardous works are planned in the same or adjacent areas.

## Permit and Tag Writing Effort

**Manual PTW processes require substantial amounts of tedious and repetitive filling out of forms by hand.**

Not only does this tie up valuable labour, but unclear handwriting or literacy difficulties can lead to errors. Shutdowns and outages can result in backlogs of permits with valuable operational personnel spending significant amounts of

time preparing permits. This is not only ineffective and wasteful but can lead to dangerous situations through human error.

Electronic systems generate all permit documentation, including tags, quickly and efficiently. Vital information is entered once – in the Work Request or Permit Application – and then automatically transferred, as required, to isolation and restoration checklists, permits, certificates and tags. This substantially reduces the risk of errors and improves safety and efficiency. It is easy to understand the savings in time, money and safety for complex plants which can produce more than 1000 permits for a single outage!

## Return to Service Delays

**A manual PTW process is often highly inefficient and difficult to manage during busy shutdowns and outages.**

Not only is there significant work by high cost resources in the preparation and issuing of permits, there is an inherent delay in returning plant to service because of the large numbers of permits which must be surrendered and restored ready for plant restart. The status of other permits, particularly those with shared isolations, is often not evident, requiring additional checks to ensure breaches do not occur. A lot of effort can be wasted simply finding out what state the plant is in and who holds which permits. Resolving just one or more permits can delay the whole return to service process, costing organisations many thousands of dollars in lost production.

Again, electronic PTW systems deliver greater efficiencies at this stage of the permit cycle. One site managing more than 1100 permits in a large outage credits their electronic system with helping them achieve a safe and rapid return to service of the plant. All permits, certificates and isolations, as well as their status are highly visible, easily accessible which facilitates planning for an optimal return to service outcome.

## Auditability

**OH&S regulations have tightened significantly with a growing emphasis on compliance and verification of processes and training. Auditing manual PTW processes is limited to reviewing paper records which cannot prove that activities were adequately carried out or in the correct sequence.**

Electronic Safe Systems of Work can provide a detailed audit trail of electronic records that can be easily reviewed at any time. Detailed records are then readily available in the event of an investigation but the real benefit is in the positive change in workplace culture. Personnel are much more likely to follow proper procedures when they know that their every action is automatically recorded in an audit trail.

Organisations using electronic PTW systems can also rely on the automatically generated audit trail of process and action in investigations and legal proceedings.

## Relearning PTW Process

Reviewing and updating manual PTW systems requires personnel to learn and adopt the new manual process and any changes in terminology. Progressing to an electronic system at a later date means that personnel must learn yet another process which may also use some different terminology. In effect, this means two changes are made in an area where changes are usually kept to a minimum. Is this the best use of your safety training effort?

Implementing an Integrated Safe System of Work software solution involves closely reviewing Permit to Work, Isolation and Risk Management procedures. Electronic systems are designed to apply business rules and workflows and to enforce process, so it makes good sense to combine these review processes with a significant step forward in delivering them.

## Process Matching with Software Package

A number of challenges may arise when moving from a newly updated manual system to electronic Safe Systems of Work. The following table identifies some of those key challenges and the opportunities which organisations should consider when determining the best options for strengthening safety and improving productivity and efficiency through improvements to their Permit to Work practices:

| Challenge   | Opportunity   |
|---|---|
| <p><b>Operators are resistant to a second change of PTW practices in a short period of time</b></p> | <p><i>Recognising that your Permit to Work, Isolation and Risk Management processes could be strengthened is the first critical step to improving work place safety.</i></p> <p><i>First, determine the outcomes that you wish to achieve and then investigate how best to achieve them. Software providers will happily show you how their systems can help you to achieve your desired outcomes.</i></p> <p><i>Today's electronic systems should be powerful and flexible enough to do this via configuration rather than extensive and costly customisations.</i></p> <p><i>Then you can undertake just one change process and concentrate on achieving the safest outcomes for your people and plant.</i></p> |

| Challenge   | Opportunity   |
|---|---|
| <p><b>Management is resistant to the cost of a second change of PTW practices in a short period of time</b></p>         | <p>Management must consider both safety and the bottom line.</p> <p>Reviewing and updating manual procedures and implementing an electronic system which also involves reviewing and updating procedures are both major projects.</p> <p>A considered approach which achieves both improved safety and delivers productivity and efficiency gains in a single project is more likely to win management approval.</p>  |
| <p><b>There may be differences in the terminology between your manual process and electronic systems</b></p>            | <p>Any review of your PTW procedures may identify issues and inconsistencies in the terminology that your personnel use, especially when compared to industry standards.</p> <p>An electronic system allows you to apply a consistent use of terminology throughout your workforce and even across multiple sites. Look for a system which allows you to use the most appropriate terminology and doesn't force you to use theirs!</p>  |
| <p><b>Electronic systems may not be able to meet your requirements without costly modifications/ customisations</b></p> | <p>Anyone who has worked at multiple organisations will be aware that there are many different ways of applying Permit to Work procedures so it should not be surprising that electronic systems may not be able to meet all of your requirements, off-the-shelf.</p> <p>Sometimes you may need to change the way that you work to achieve your desired outcomes using an electronic system but you should be able to find a software package which is powerful and flexible enough to be configured to meet the majority of your requirements.</p> <p>Again, focus on your desired outcomes, not just the process.</p> |
| <p><b>The design of the electronic system's permit documentation doesn't match your current design</b></p>              | <p>Most electronic systems in the market place today can match the current design of your permitry documentation. This is valuable as it helps to minimise resistance to change as you implement a safer work place.</p> <p>However, the look of your permits and tags shouldn't be a major consideration in selecting an electronic system. This documentation simply supports the process. An electronic system enforces it and that is where you will achieve the greatest gains in safety, productivity and efficiency.</p>   |

## Conclusion

In summary, many of the activities required for revising a manual process must then be duplicated to implement an electronic safe work system. Clearly, the greatest savings in money, time and safety are achieved by moving directly to a computerised system at the time of initial PTW process re-design and implementation.

Industry has grown and developed through the centuries by identifying and adopting technologies which deliver increased productivity and efficiency. The adoption of support systems which contribute to this increased productivity and efficiency should be viewed in the same manner. Systems and tools which make your business safer and more profitable should be given the highest priority.

This White Paper has clearly shown that it is not necessary, nor even advisable, to persist with the refinement of paper-based manual Permit to Work processes when computer-based systems can and do deliver such significant benefits.

## About the author:

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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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