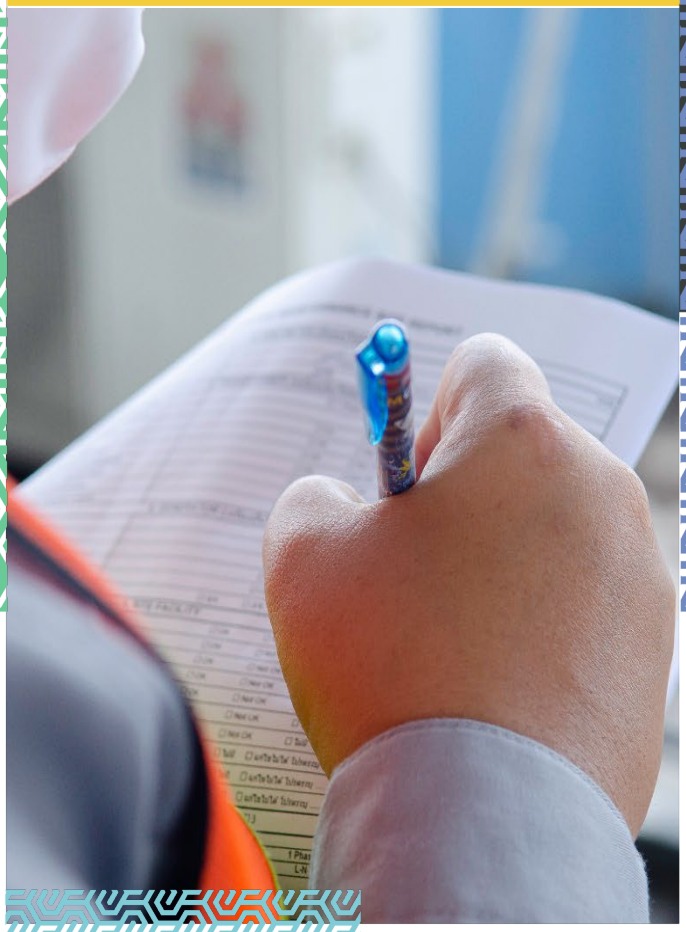
Risk control

Permit-to-Work Management



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Permit-to-Work Management

Introduction

This guidance document explores the requirements of Permit-to-Work arrangements that need to be in place to control significant areas of health and safety risks, taking a close look at the procedures that should be in place to ensure a successful management of these risks.

The Health and Safety Executive's (HSE) definition of a Permit-to-Work is a documented procedure that authorises certain people to conduct specific work within a specified period. It sets out precautions required to complete work safely, based on risk assessment. It describes what work will be done and how it will be done[1].

Hot works presents significant risk to institutions and so we will take an in-depth examination of the requirements of Hot Work Permits providing valuable information on its successful management.

Requirements

A Permit-to-Work is a rigorous management mechanism that ensures controls are appropriate to the risks faced, confirmed to be in place and clearly communicated and understood by all stakeholders.

It is essential that Institutions establish a robust policy for Permit-to-Work management and use, setting expectations of when a Permit-to-Work must be used, management responsibilities, training requirement and relevant monitoring activities. Ensuring suitable governance procedures are in place to communicate the assurance that risks are being controlled appropriately.

The following list provides some examples of when a Permit-to-Work could be used (but not limited to):

- Hot works
- Confined spaces
- Electrical Permits (isolations) high / low voltage
- Excavations
- Fire system impairments
- Working on pressure systems

Consideration should be given to additional permit arrangements, for example providing a procedure for accessing restricted areas. The following list provides details of areas that may require an Access Permit (but not limited to):

- Plant / communication rooms
- Roof access
- Workshop / laboratory (CL3 or others)
- Contaminated areas

The difference between a Permit-to-Work and an Access Permit should be made clear. A Permit-to-Work manages risks from undertaking a high-risk activity whereas an Access Permit provides controlled access to areas that may present inherent risks or contain sensitive infrastructure. Certain activities may require both types of permits to undertake specific tasks, for example, undertaking hot works on a roof will require a Hot Work Permit-to-Work and a Roof Access Permit to be in place making these permits inter-dependable. If this is the case, then a sequence of raising and cancelling the relevant permits must be documented.

Procedures

The Health and Safety Executive set essential elements of a Permit-to-Work[2]. The permit documentation should include (but not limited to):

- Description of the type of permit
- Unique permit number
- Location of work
- Details of the work to be performed
- Times / dates of work and duration
- Identification of hazards
- Control requirements (including Emergency Plans)
- Personal Protective Equipment requirements

It is essential that the details of the Permit-to-Work are communicated to all stakeholders involved in the work being conducted. Consideration should be given to displaying the Permit-to-Work to ensure that no inadvertent activities compromise the conditions of the Permit.

Clear procedures must be followed with respect to the use of a Permit-to-Work. These procedures should detail how they operate, clearly describing how any suspension, handover, hand-back, and permit authorisations work. Further consideration should be given to how the procedures are established, maintained, and oversight is maintained of the procedures.

Permits-to-Work are time bound and should never be issued for more than one operation or extended over more than a single shift. If the maximum permit period needs to be extended, the Permit Issuer must be informed, and a new permit issued by them with all sections completed and signed off by all stakeholders.

1. Permit title	**2. Permit reference number** Reference to other relevant permits or isolation certificates
3. Job Location	
4. Plant identification	
5. Description of work to be done and its limitations	
6. Hazard identification Including residual hazards and hazards associated with the work	
7. Precautions necessary and actions in the event of emergency People who conduct precautions, e.g. isolating authority, should sign that precautions have been taken	
8. Protective equipment required	
9. Issue Signature (Permit Issuer) confirming that isolations have been made and precautions taken, except where these can only be taken during the work. Date and time duration of permit. In the case of high-risk work, a further signature from the Authorising Officer may be needed	
10. Acceptance Signature confirming understanding of work to be done, hazards involved, and precautions required. Also confirming permit information has been explained to all permit users	
11. Extension/shift handover procedure Signatures confirming checks made that plant remains safe to be worked upon, and new Permit Issuers and permit users made fully aware of hazards/precautions. New expiry time given	
12. Hand-back Signed by Permit Receiver certifying work completed. Sign by Permit Issuer certifying work completed and plant ready for testing and recommissioning	
13. Cancellation Certifying work tested and plant satisfactory recommissioned	

Figure 1 – Essential elements of a Permit-to-Work form

Roles and Responsibilities

For an effective operation of a Permit-to-Work procedure, specific roles and responsibilities will need to be established. The stakeholder roles below should be reflected within institutional policies along with details of lines of management.

Senior Management – sets the requirements and receives assurance that the Permit-to-Work procedures are working properly.

Authorising Officer – has holistic oversight of the Permit-to-Work procedures to monitor and ensure the correct use and that high-risk activities are being properly controlled. In small institutions the Authorising Officer and Permit Issuer may be the same person.

Permit Issuer – is a competent person that issues a Permit-to-Work after ensuring all requirements are met.

Permit Receiver – is a competent person that receives permits-to-work and is usually the person managing or undertaking the high-risk activity. This may be either be an in-house service provider or external contractor.

Defining duties for each of the roles above will ensure that clear management structures are in place and Permit-to-Work procedures can operative effectively.

Training and Competence

High-Risk activities that require the operation of a Permit-to-Work may be complex and require specific knowledge to ensure that all requirements are met. It is therefore essential that employees that have duties relating to Permit-to-Work are competent.

The Health and Safety Executive defines competence[3] as a “combination of training, skills, experience, and knowledge that a person has and their ability to apply them to perform a task safely”. Additionally, they also suggest factors such as attitude and physical ability can affect someone’s competence.

Employees undertaking duties that are identified in the operation of a Permit-to-Work procedure must have adequate support to discharge them. Identifying suitable and sufficient training is crucial and should be monitored by senior management to ensure that all stakeholders qualifications remain current. For example, if a Confined Spaces Permit-to-Work is required then a Permit Issuer must understand the requirements of the related regulations or seek advice in relation to the works to be performed.

Risk Management

Activities that require a Permit-to-Work are often non-routine and have inherent risks that require stringent control measures to be in place. The first part of the procedure should be to determine exactly what the activity will involve. Undertaking a suitable and sufficient risk assessment should establish if a Permit-to-Work is necessary. Effective planning for the management of risks associated with these activities is crucial, ensuring that suitable arrangements are identified and will be made available. These management arrangements may include (but not limited to):

- Risk assessment documentation
- Method statements / safe operating procedures
- Construction phase plans
- Competency of stakeholders (Permit Receiver / Users)
- Requirements of isolations

Ensuring that suitable arrangements are necessary, allowing time for Permit Issuers to consider, evaluate and feedback on the arrangements will ensure understanding of risk and the associated Permit-to-Work procedures. These arrangements will also establish the scope of the work and should by reflected in the limitations of the Permit-to-Work. If these limitations are exceeded, then work must stop and revisited by the stakeholders involved.

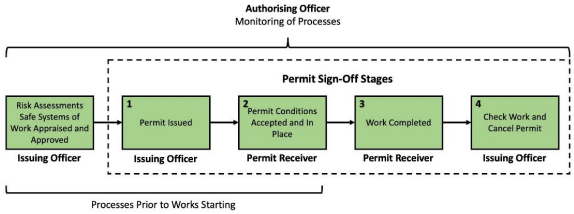
Operation

Permit-to-Work procedures can be operated using either paper-based or electronic systems. Whichever method is used, ensuring that stakeholders involved are competent and proficient in it use. If an electronic system is used, then the institution must ensure that:

- A suitable system (password protected electronic signatures) is in place to prevent unauthorised issue or acceptance
- Permits cannot be issued remotely without a site visit
- Systems are in place to prevent permits already issued from being altered without the alterations being communicated to all stakeholders
- The facility for paper permits to be produced for display at the job site
- Training is provided to ensure that all stakeholders assess the specific work
- Suitable backup systems are available in the event of issues

A Permit-to-Work operates in separate stages. Initially, the risk management arrangements should be evaluated and approved before the issue of a Permit-to-Work is considered.

Diagram 1 – Typical stages of a Permit-to-Work procedure



Once the risk management arrangements have been approved by the Permit Issuer then stage 1 of the Permit-to-Work can be completed.

Stage 1 – Prior to works starting a Permit Issuer should ensure that any requirements / control measures are in place before allowing works to commence. This includes gaining confirmation that any pre-start tests meet any limits set. For example, air quality test meets the standards set before any confined space entry. Once the Permit Issuer satisfies themselves that all requirements of the Permit-to-Work are in place then a Permit Issuer can sign this stage off. It should be made clear if work moves outside the scope of the Permit-to-Work then work must be stopped and the Permit Issuer notified. If safety cannot be re-established, then the area must be made safe and then arrangements revisited to ensure adequate controls are always in place. This may require the Permit-to-Work to be cancelled and a new permit raised.

Stage 2 – The Permit-to-Work is now passed to the Permit Receiver. A discussion between the Permit Issuer and Permit Receiver should result in confirmation that all control measures are in place, and that they are happy to proceed with the work. The Permit Receiver now signs to confirm, and work is ready to start.

This stage of the Permit-to-Work remains in place for the duration of the work. It is good practice that the Permit Issuer re-visits the site to ensure that all the identified control measures remain in place. As Permits-to-Work are time bound, establishing updates on the status of the work to ensure it finishes as planned are recommended as this will ensure the Permit-to-Work stays in place and valid. Undertaking these visits enables evaluation of the work and methods used. These visits should be recorded to enable feedback into service delivery or contractor management contract reviews.

Stage 3 – The work has been completed, and the location of the work has been left in a safe condition. If not, there may be a requirement to extend the Permit-to-Work. An extension can only be granted by the Permit Issuer. The Permit Receiver signs the Permit-to-Work at this stage to confirm that the works have been completed, and the area is safe to hand back.

Stage 4 – The Permit Issuer can now cancel the Permit-to-Work ensuring that all the requirements have been met, and the location of the work has been left in a satisfactory condition and is safe. At this stage, any commissioning required as part of the work should also have been completed. Any cancellation of a Permit-to-Work should be in person and on site to ensure that the Permit Issuer is satisfied. The Permit Issuer can now sign to cancel the Permit-to-Work.

Completed permits should be checked by the Authorising Officer and retained as per the institutions document retention policy.

This four-stage approach can be used for most types of Permit-to-Work or Access Permits. Only the requirements will be different.

Monitoring, Audit, and Review

Success of a Permit-to-Work procedure depends on the awareness of people performing duties identified. If they do not have a sound understanding of the required Permit-to-Work or isolation, what it means to them and what their responsibilities are, the procedure will have limited effect.

Monitoring activities should form part of the requirements of the Permit-to-Work policy establishing monitoring practices that brings value to the procedure by ensuring that permits-to-work are being managed correctly. Monitoring checks should be undertaken to validate compliance with the requirements of policy, with information gained from monitoring being used to reinforce safe working practices. Evidence of checks should be retained and reviewed during periodic Permit-to-Work audits.

Permit-to-Work procedures should be audited regularly, by competent people, preferably external to the department or professional service. Any audit procedure should examine monitoring records and Permit-to-Work arrangements. Non-conformity with the Permit-to-Work procedure should be recorded with any improvements identified and implemented. Stakeholders should be notified immediately if any non-conformance is identified.

Review of the holistic Permit-to-Work procedure should be undertaken periodically and should consider audit reports, and any improvements identified from learning from incidents or safety alerts.

Hot Works

Hot works presents significant risks and can be defined as “any procedure that generates flame, sparks or heat.” The following list includes (but not limited to) common types of hot work:

- Gas / electric welding and cutting apparatus in engineering and construction
- The use of blowlamps / blow torches, and hot air guns
- The use of bitumen and tar boilers
- Brazing and soldering activities associated with installation or maintenance of heating, water, and ventilation systems
- Use of angle grinders and grinding wheels used for a variety of material cutting and shaping procedures

Pre-Issue

Ensuring that suitable and sufficient arrangements are in place for this type of work to proceed is essential. Hot work may be a significant part of the required work, and the control measures must be consistent across each area of work. Hot Work Permit-to-Work should not be used across multiple areas of work, as this may lead to a lack of control of risks.

If in-house employees or contractors are undertaking works, the associated safety arrangements and level of control must remain appropriate.

Considerations when appointing a contractor (but not limited to) are:

- Get references from previous customers
- Ask to review safety arrangements and records
- Review competency of on-site staff
- Ensure safety documentation is specific for the work
- Ensure tenders and contracts clearly state site safety policy requirements
- Confirm levels of contractor insurance is adequate for the work

Once all management arrangements are confirmed appropriate by the Permit Issuer then the formal Permit-to-Work procedure can begin.

Stage 1 – Permit Issuer to Check

Sparks and heat generated from hot work can often spread a considerable horizontal distance and precautions should be taken to remove or suitably protect combustible materials within a 10-metre radius of the hot work.

In some circumstances where hot work is taking place at height, consideration should be given to sparks and hot materials falling into vulnerable areas such as basements or the bottom of stairwells. These should be cleared of all combustible materials where possible.

The area where combustible materials are stored or accumulate should be cleared including deposits of dust as these are often very easily ignited.

Any compressed gases, flammable liquids, and other flammable substances should be removed from the area where the hot work is to take place.

Where materials within a 10-metre radius cannot be removed, they should be completely protected by non-combustible fire-retardant blankets or coverings. All combustible construction elements should be covered, and all gaps, holes and openings in ceilings, floors and walls should be sealed or protected.

We have highlighted the need to remove or protect combustible items within a 10-metre radius of the hot work, but it is also important to remember that heat can be conducted through partitions and walls, particularly by metal or similar conductive materials. Check other sides of partitions or walls and remove or protect any combustible materials that may ignite by direct or conducted heat.

The location for the proposed hot work should be checked for composite panels with combustible insulating core material. Cold stores, for example, may be constructed with combustible materials in walls and ceilings. If combustible materials are suspected or confirmed, then hot work should not be conducted and alternative methods used.

Any hot work planned in areas identified as a hazardous zone through a risk assessment required by the Dangerous Substances and Explosive Atmospheric Regulations 2002[4] should be tested and certified as non-hazardous before any hot work commences.

When hot work is to take place in buildings fitted with an automatic fire detection system incorporating smoke or heat detection then only the detectors or zone where the work is being conducted should be isolated. Any isolated detectors or zones should be reinstated as soon as the hot work has been completed.

Suitable fire extinguishers as identified through risk assessment should be available where hot work is taking place.

Hot work should only be conducted by competent personnel who are familiar with the equipment, material to be used and with the knowledge and experience of operating a Hot Work Permit-to-Work procedure.

Equipment should be lit for as short a period of time as possible before work starts, extinguishing immediately after work is completed, and should never be left unattended when alight.

Only when all the relevant checks have been completed should the Permit Issuer sign off this stage of the Permit-to-Work.

Stage 2 – Permit Receiver to Check

At this stage, the Permit Receiver will ensure that all measures identified are in place, confirming this by signing the Permit-to-Work.

The Permit Receiver must ensure that all identified arrangements are in place before and during the work to ensure that the risks from hot work are managed appropriately. Monitoring activities should take place throughout the hot works to ensure that the area remains safe.

Once all hot work has been completed, then the fire watch can start.

History has shown that a substantial number of fires take hold several hours after hot works have been completed. This is usually because residual conducted heat within the structure, or small smouldering embers hidden under floors or in void areas goes undetected. These can develop slowly until either additional fuel or oxygen is reached and the fire suddenly bursts into life.

To avoid this situation, a trained person should provide a continuous fire watch of the immediate and adjoining areas for the full duration of the hot works. The trained person should know how to raise the alarm and how to safely use the supplied fire extinguishers. All those involved in the hot works should be familiar with the buildings Emergency Plan and means of escape.

Fire Watch

The fire watch should be retained for 60 minutes after completion of the hot work. Thermal imaging cameras can be used as a good practice method to effectively identify both normal and elevated temperature conditions in and around the area where hot works have been performed.

The person conducting the fire watch must:

- Be empowered to stop hot work operations if unsafe conditions develop

- Be familiar with the procedures to sound the alarms
- Be continuous, including responsibility for handovers during rest breaks, etc
- Equipped with at least one fire extinguisher suitable for the environment
- Remain in the hot work area for a minimum of 60 minutes after work is completed

  Once hot work operations have been completed, the area must be cleared of associated hot work equipment and waste materials with all isolated/impaired fire detection and suppression systems reinstated to full operation. Impaired fire alarm panels must also be restored to normal operation.

  The fire watch must remain for a minimum of 60-minutes after the completion of hot work to watch the area for any signs of potential fire development from the operations that had concluded. If there are no signs of a potential fire development for 60-minutes after the hot work has concluded, the Hot Work Permit-to-Work completion signature with date and time must be entered by the assigned fire watch or manager (Permit Receiver). After the permit completion signature and confirming that area monitoring will be in place for a minimum of 3 hours (see Monitoring Methods), they may leave the area. The permit should remain in the work area until a final area check and cancellation signature is made (after area monitoring is completed).

Monitoring Methods

All institutions with buildings insured by RMP must undertake post fire watch monitoring.

After the fire watch has concluded (a minimum of 60-minutes after the hot works has been completed) the area must then be monitored for an additional 3-hours.

Monitoring is defined as watching the area for any signs of potential fire development but with less strict direct requirements than those of a fire watch.

Monitoring methods can include (but not limited to):

- Personnel working in the area that are made aware hot work had occurred and the risks it entailed
- Automatic smoke detection over / in the area where the hot work was conducted that can quickly detect and signal smoke development. This would require restoration of any impairment to the detection system and / or removal of protective covers intended to prevent detector operation that were made during the hot work
- Security or maintenance rounds, briefed on the added inherent risk, walk through the hot work area no more than every 30-minutes
- Area monitoring by security cameras having integrated smoke detection
- Unlike a fire watch, a specific person or persons do not need to be individually assigned for the hot work monitoring. However, someone must be assigned the responsibility to ensure this is properly completed and for the entire required time. This is typically the Permit Issuer.

  Once the monitoring activities are complete the permit can now be cancelled by the Permit Issuer on site.

Common Pitfalls

Permits-to-work are used to control high-risk activities and must be undertaken seriously to ensure they remain effective. Below are some examples of common pitfalls associated with Permit-to-Work procedures:

- High-risk activities take place without a Permit-to-Work in place. This may occur for several reasons; an institute's policy is not in place or is not clear; the risks are not recognised; or the situation develops and is not brought under the control of Permit-to-Work procedures
- Unfortunately, some Permit-to-Work systems are ignored by personnel within institutions as they may be perceived as being overly complex and bureaucratic. Having clear policies and arrangements in place will identify people who will be responsible for managing and issuing permits-to-work
- Untrained or unauthorised people issuing Permits-to-Work pose significant risks. Not understanding the requirements of certain Permits-to-Work may lead to situations where inadequate control measures are in place or missed, presenting a higher risk
- Permits-to-work can be complex in nature, and without significant training they may be used incorrectly. Ensuring an Authorising Officer is appointed will capture these errors, allowing for interventions to occur that improve the management of Permit-to-Work procedures.
- Permits-to-Work can be seen as unnecessary and may be raised and completed once works have been completed, if adequate monitoring activities are taking place this should establish if this type of violation occurs.
- The Permit Issuer is responsible to ensure that all works have been completed and any area effected is in a safe condition. All Permits-to-Work must be signed, and confirmation received on-site and not remotely.

— Sometimes, works overrun. However, a valid Permit-to-Work must be in place throughout the work and so if overrun occurs the Permit Issuer should be notified so they can grant an extension or issue a new Permit-to-Work.

— In some situations, there may be requirements to have multiple Permits-to-Work or Access Permits to be issued. For example, works consisting of hot works in a confined space. If inter-dependent permits are in place, then the Permit Issuer must understand the correct sequence of cancellation to ensure the safety of everyone involved.

Conclusion

Maintaining robust Permit-to-Work procedures will enable institutions to ensure high-risk activities are managed consistently to reduce the associated hazards and risks. Institutions should clearly define any requirement of a Permit-to-Work procedure through collaboration with relevant stakeholders ensuring that any procedure is understood and implemented consistently.

Training stakeholders is essential in providing them with the guidance and support needed for the management of Permit-to-Work operations.

The establishment of governance structures and assurance reporting on the adequacy of any Permit-to-Work procedure is crucial to enabling senior management teams to be informed of any non-conformance or notification additional support may be required to support the stakeholders or the procedure.

References

1. Definition of Permit-to-Work, Health and Safety Executive https://www.hse.gov.uk/coshh/basics/permits.htm
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3. Competency definition, Health and Safety Executive https://www.hse.gov.uk/competence/what-is-competence.htm
4. The Dangerous Substance and Explosive Atmospheres Regulations 2002 https://www.legislation.gov.uk/uksi/2002/2776/contents/made

Further information

For access to further RMP Resources you may find helpful in reducing your institution's cost of risk, please access the RMP Resources or RMP Articles pages on our website. To join the debate follow us on our LinkedIn page.

Get in touch

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