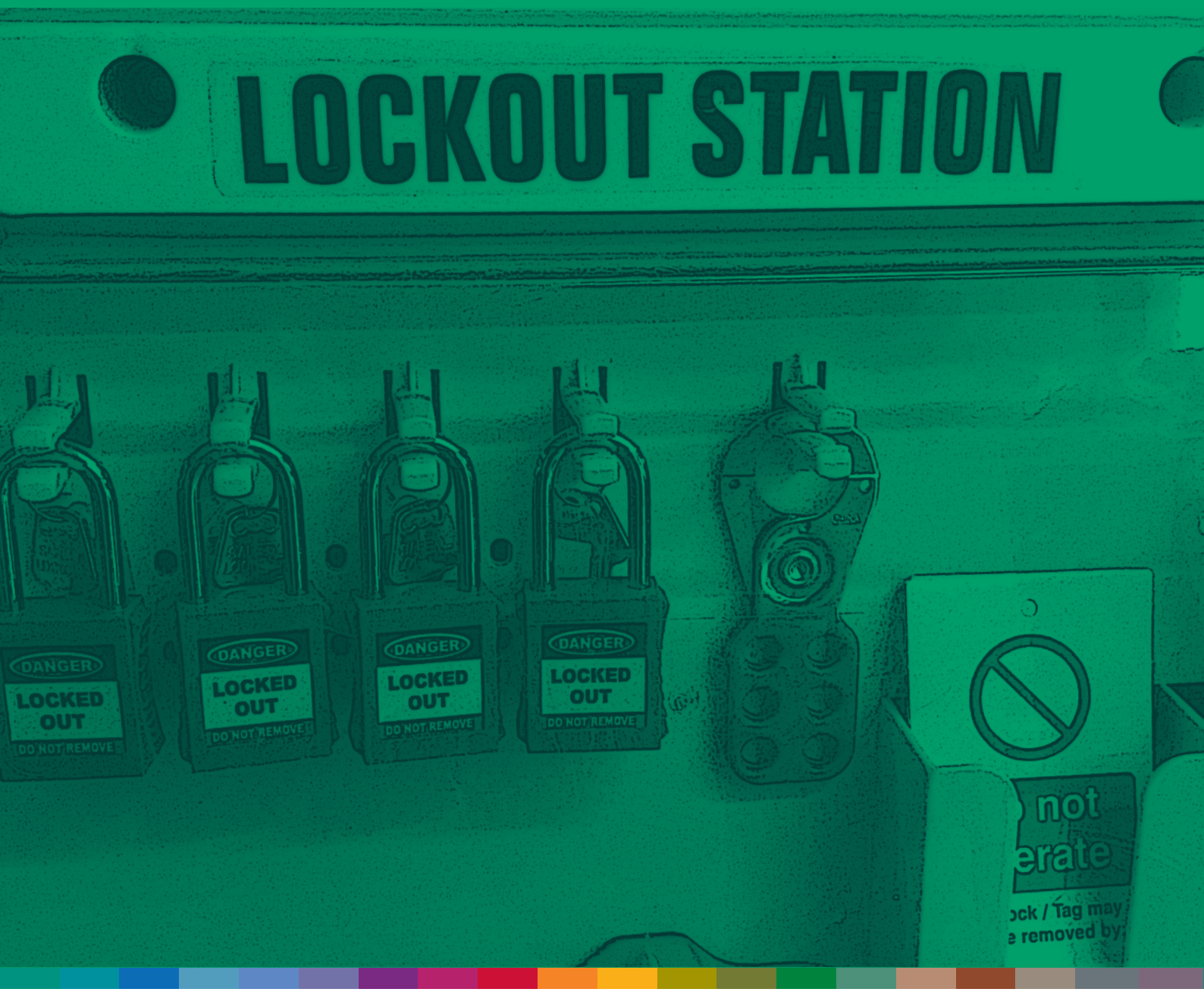
mpa British Precast

British Precast Guidance for:

ISOLATION



2019

British Precast

British Precast Guidance for: ISOLATION

CONTENTS

Published and distributed by:
British Precast
The Old Rectory, Main Street
Glenfield, Leicester
LE3 8DG

Tel: 0116 232 5170
Email: info@britishprecast.org
www.britishprecast.org

British Precast

1 INTRODUCTION

Within the mineral products industry, repair, service and maintenance work is done on machinery, equipment and processes every day. Where maintenance, or cleaning, requires that normal guarding is removed, or access is required inside existing guarding, then additional measures are needed to prevent danger from the mechanical, electrical and other hazards that may be exposed.

It is important to ensure the isolation of any unsafe machinery/equipment from potential uncontrolled energy sources during repair, service or maintenance work. These works can require simple electrical or mechanical isolation procedures, or more complex isolations involving multiple isolation points, personnel and more than one source of energy.

The aim of this guidance document is to set out guiding principles and standards that should be followed when isolating plant and equipment. This includes risk assessments, proper isolation controls, and testing how well controls work. The isolation process is also known in industry as 'Lockout / Tagout / Tryout' (LOTOTO) and is used to isolate machinery and equipment from its energy source. Isolation can be used as a standalone method of ensuring the safety of maintenance staff carrying out maintenance operations where permits to work are not necessary, or as part of a Work Permit requirement.

There should be clear company rules on what isolation procedures are required, and in which circumstances. For example, some cleaning of mixing machinery or items of mobile plant may require isolation, even though it might not be considered a maintenance task.

The basic rules, however, are that there should be isolation from the power source (usually, but not exclusively, electrical energy), the isolator should be locked in position (for example by a padlock), and a sign should be used to indicate that maintenance work is in progress. Isolation requires use of devices that are specifically designed for this purpose and not devices such as key-lockable emergency stops or other types of switches, e.g., interlocks, that may be fitted to the machine. Any stored energy (hydraulic or pneumatic power, for instance) should also be dissipated, and any parts that can move, for example under gravity, should be scotched or chocked before the work starts.

If more than one maintenance worker is involved in the work, each of them should lock off the power with their own padlock. Multi-padlock hasps can be used in such circumstances.

Before entering or working on the equipment, it is essential that the effectiveness of the isolation is verified by a suitably competent person. Reverse flow from other equipment upstream, or connected to common mains, e.g., exhaust lines, should also be considered and backflow prevented.

2 RESPONSIBILITIES

The responsibility for implementing isolation procedures will vary for each business, but in general it is normally the responsibility of the site management of the business unit, for instance a ready-mixed concrete site manager, quarry manager or concrete product site manager. In some instances, the responsibility is cascaded upwards or downwards as is appropriate for the requirements of a particular individual business.

3 DEFINITIONS

Complex Isolation – An isolation event where a number of separate isolations are required to allow work to be completed safely.

Dangerous Parts of Machinery – Parts of work equipment that could foreseeably cause injury.

Danger Zone – Any zone in or around machinery or equipment in which a person is exposed to a risk to health or safety from contact with a dangerous part of machinery or a rotating stock-bar or hazardous energy.

Energy Types

- Electrical energy
- Pneumatic / hydraulic energy
- Electromagnetic energy
- Chemical energy
- Radioactive energy
- Steam energy / heat
- Gravimetric energy
- Hot and freezing surfaces
- Mechanical energy
- Stored / potential / kinetic energy

Energy Isolating Device – A device that physically prevents transmission or release of hazardous energy.

Energy States

- **Hazardous Energy –** Any source of electrical, mechanical, hydraulic (liquid pressure), pneumatic (air), chemical, thermal, radioactive, gravitational, stored, residual, potential or any other energy that, if not controlled, could cause injury to personnel or damage to property.
- **Residual / Stored Energy –** Remains in machinery or equipment after it is shutdown.
- **Zero Energy State –** Isolated from all energy sources and does not contain residual or stored energy or the potential to re-accumulate residual or stored energy. Where residual or stored energy cannot be eliminated it must be securely restrained or otherwise rendered safe.

Equipment – Equipment is a systematic compilation of machines or units which might be interconnected through their function, control or safety measures. For example:

- Pneumatic systems
- Process engineering systems
- Grinding, mixing plants
- Electrical wiring systems
- Switchgears in energy supply systems
- Conveyors
- Crushers, screen decks, wash bins, hydraulic elevators
- Hoists
- Ovens, kilns and autoclaves
- Forming, cutting, handling and storage systems

Other systems where hazards can occur are also considered equipment. For example:

- Mobile plant
- Road going vehicles
- Ships
- Trains
- Workshop machinery and equipment
- Transport mixers, concrete pumps

Equipment Isolation – Equipment isolation is the process that protects personnel, who perform service, maintenance, and other work on equipment, from injuries that could result if equipment is unexpectedly energised, started, or set in motion by an energy supply or by the release of potential and stored energy.

Guard – Any system preventing or limiting access to dangerous parts of machinery and / or equipment.

Interlock System – Interlock systems protect from accidental injuries by, for example, stopping the machine when a person or a person's body part enters a danger zone. An interlock system should not be used as a means of isolation, unless it has been specifically designed for the purpose, e.g., as may be the case for a trapped key system. An interlock system typically comprises an input device, e.g., an interlock switch, a logic unit, e.g., a safety relay, and an output device, e.g., an electrical contactor that removes power to the drive.

Input devices include light curtains or beams, electric or magnetic contacts and pressure sensors. For high hazard applications interlock systems that fail safe should be selected.

Isolation Controller / Supervisor – An individual with overall control over a complex isolation. This individual should be appointed in writing. Normally the isolation controller is the first person to attach their personal padlock to a multi-hasp and the last one to remove it following completion of the isolation event – this is to maintain control over the event and to ensure all relevant control measures have been put back in place before re-energising the equipment or plant. This person also ensures that where a shift handover occurs, that his/her padlock is not removed until the isolation controller on the following shift has made all necessary checks to ensure safety and attached his/her own padlock. Only then can the first shift isolation controller remove their own padlock.

Isolation Lock – A padlock with a single key. No other key used on site shall be able to open the isolation lock, and no other lock used for isolation shall be opened by the key to this lock. Isolation locks bought from specialist suppliers can be obtained which include references to the fact the padlock is being used for isolation, may include the owners name or a reference number marked on the lock. Some companies also prefer locks used by Contractors to have a 'C' or 'Contractor' engraved on them along with an ID number. Where any padlocks are supplied with duplicate keys the duplicate key MUST BE DESTROYED.

Isolation Procedure – A written procedure which identifies all hazardous energy sources which affect a specific item of equipment, machinery or process and the appropriate controls, and which provides instructions for the person carrying out the isolation on exactly where to apply isolation securing devices, and which ones to apply to the specific item of equipment, i.e., specific references should be used to avoid confusion – particularly where multiple examples of the type of equipment are on site.

Labelling / Marking of Isolation Points – All equipment isolation points must be clearly and durably labelled / marked to indicate the specific item of machinery or equipment they isolate. This must be done consistently across the site. Where multiple similar items of equipment exist near to each other, the isolation point label / markings must be replicated with an identification label / markings to avoid possible confusion. The name / label of the machine / equipment must be consistent with any other process names, e.g., where equipment is controlled by a computer, the machinery or equipment must be named to the same convention as that used in the control system to avoid possible confusion.

Lock Box – A physical box designed to hold multiple isolation lock keys from complex isolations which provides a single point for workers to apply their physical isolation locks.

Lock Out – The placement of a personal lock on the hazardous energy isolating device in a position that prevents the operation, i.e., movement, of the energy isolation device and energisation of the item of plant or equipment until the removal of the lock in accordance with established procedures.

LOTOTO – The equipment isolation procedure is also called "Lock out, tag out, try out" (LOTOTO), mentioning some of the main steps of the process.

Multi-Hasps – Are devices at isolation points of equipment that permit several isolation locks to be attached to a single isolation point. Several multi-hasps can be chained together where required to permit sufficient isolation locks to be attached. It must not be possible to remove a multi-hasp device whilst it is secured with an isolation lock.

Tag – A durable label applied at the isolation point designed to inform other people that the item of equipment has been isolated for the safety of people at work, the date, name of person who applied it, and the purpose of the isolation. Tags on isolation locks are used to identify the user of a specific lock (particularly useful where a bank of isolation locks is used 'on demand' in preference to individually issued named locks).

Tag Out – Placing a tag on a lock or point of isolation to identify who placed the lock and when it was placed.

4 GENERAL PRINCIPLES

Prepare

Includes identification and preparation of the isolation equipment involved in the task and any other areas of machinery. All isolation equipment which is necessary to isolate machinery, mobile and static plant, valves, etc. from energy sources and to perform necessary tasks has to be inspected prior to use and properly maintained in good working order. Equipment must be readily available to all workers in sufficient number.

Operational procedures are often affected by isolation events; therefore, it is necessary to plan any equipment isolations in advance and to inform the personnel involved.

Caution: Equipment isolation always has to be performed if danger may occur to people working. Even if a task seems to be easy, like moving a product to the right position on a conveyor, necessary safety measures have to be implemented.

For every task requiring isolation there must be suitable and sufficient risk assessment undertaken. the risk assessment must be reviewed prior to the isolation process to ensure it is valid, taking into account the frequency and level of exposure as well as the severity of any potential incidents. Existing risk control measures are to be taken into account. Risk assessments will identify if isolation at a central point, e.g., electrical distribution board, a point close by the machine, e.g., control cabinet, or an individual piece of plant, e.g., local isolator, is the most appropriate option. The findings of the risk assessment must be recorded along with safe work procedures before an isolation event is conducted. The risk assessment and safe working procedure must be communicated to all persons involved in the isolation event.

Review local isolation procedures for the affected item of equipment or plant, the method of LOTOTO (simple/complex), the potential for stored energy, the types of lockout devices required, the isolation method to be adopted, the test and energy dissipation methods to be employed and who needs to be informed/involved. For complex isolations the Isolation Supervisor/Controller shall control the isolation event. For more complex processes/higher risk activities, or where contractors are involved, the Isolation Supervisor/Controller shall assess whether a permit to work is also required.

Many companies also employ the use of a documented isolation register/record to document the details of the isolation event. See your own company procedures for details.

Notify

The effects of the isolation event shall be clearly understood and communicated to all affected personnel. Relevant individuals shall be advised to stay clear of, and instructed not to operate, the affected machinery or equipment.

Turn Off / Shutdown

Ensuring the local isolation procedure for the item of plant or equipment, positively identify each energy source, cross referencing isolation points and equipment labels and signs.

Where it is safe to do so, test that the isolation is effective by attempting to start the equipment in order to confirm that the start function and isolation point identification match.

Each energy source shall be shut down, turned off and de-energised. An orderly shutdown shall be utilised to avoid any additional or increased hazard to individuals as a result of equipment stoppage.

Every conceivable effort must be made to allow the person(s) performing the required tasks on the system to be able to disconnect and isolate the energy. For higher hazard isolations some supervisory checks will also be necessary. Such involvement provides for the highest level of controlling risks.

Caution: The simple turning off of any equipment through switches, conveyor pull-wires, emergency buttons or interlocks does not replace a proper equipment isolation process.

Isolation

The equipment including adjacent and interfering equipment must be secured against restarting, and if applicable, backflow. The safety measures have to ensure the prevention of restarting by someone else, e.g., unique key padlocks, Castell or Fortress Isolation key banks.

Where additional switch mechanisms of the equipment exist (second electrical feed supplies, generator back-up, etc.), this equipment also has to be secured against restart.

For electrical isolation, and other power sources, the isolator must be clearly labelled, and the isolator switch must be capable of accommodating a multi-hasp type unit that will allow for multiple locks to be used.

Other power sources, i.e., hydraulic, pneumatic or steam, may require 'double-valve' isolation. The risk assessment process will identify isolation and venting requirements.

It may be necessary to dissipate stored energy, e.g., pneumatic or hydraulic energy, before a person may safely interact with machinery. Careful consideration must be taken during the risk assessment process as to how, when and where to isolate and / or dissipate energy. Scotching or chocking of parts that may move under gravity or spring pressure may also be necessary.

Where isolations have to be made, individual locks must be utilised. Should the situation require it, e.g., where more than one person has to work on or in the machine, 'multi-hasp' type equipment must be used to allow for each person to make an effective isolation.

Important: Where there are multiple energy isolation points, each one must be locked off by each person involved in the isolation event to ensure they have control of the isolation.

Isolation Equipment

Personal Padlocks

The key to the padlock shall be unique with no spare keys.

There should be sufficient padlocks available to enable workers to perform proper equipment isolation processes.

Shackles should be able to fit all multi-hasps, and other associated lock off equipment, ideally not exceeding 6mm in diameter.

Clearly traceable to the employee (ideally named) or individual to whom the padlock was issued by its unique isolation lock ID.

While operating, each worker must have exclusive access to his/her personal padlock and key in order to guarantee his / her safety.

Contractors padlocks should be distinguishable from employee padlocks – Consider engraving a 'C' or 'Contractor' along with the ID number.

Multi-Hasps and Lock Boxes

A hasp works by allowing each employee to attach their lock to the energy source. This means that a device or hasp is used to lock an energy source and then, in turn, each employee locks out the hasp. This ensures that the device cannot be removed from that energy source until all employees have removed their locks from the hasp. A hasp is required at each energy source for a lock out with multiple employees. Sufficient numbers, including spares, must be readily available.

They should be of suitable design and sufficiently robust to ensure they cannot be easily defeated or easily removed once personal padlocks are secured.

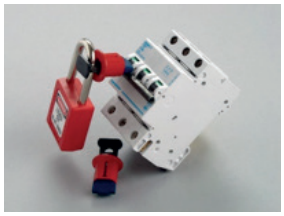
Where a multi-hasp becomes full with personal padlocks, alternative means for additional locks must be provided, e.g., an additional multi-hasp added to the multi-hasp already in place. Always confirm that the isolator is robust enough to withstand the additional load.

Lockout key boxes may be used for isolations involving a large number of energy isolations and/or large groups of individuals involved in the energy isolation event, provided all the necessary isolations and lock–offs can be ensured. One method of achieving this is by having a checklist which records what isolations are required and enables a positive check to be made that the necessary isolation and lock offs have been made and the required number of keys have been placed into the box. Lock boxes are particularly relevant where the weight of multi-hasps and padlocks may damage the equipment being isolated. The lock box has the same effect of making each employee responsible for the whole lockout session/isolation event.

How a group lock box works is that each energy source is locked out (using regular lockout padlocks) by an employee in charge (Isolation Supervisor/Controller). Then the keys for all those locks are placed into a group lock box. This lock box is then locked by each employee involved placing their individual locks onto the box. Having an employee in charge ensures than the keys to unlock all the energy sources cannot be accessed unless all involved employees are aware and remove their locks from the group lock box.

Caution: Combination locks, cable ties (binder), wires or similar must not be used in place of a properly designed and manufactured multi-hasp.

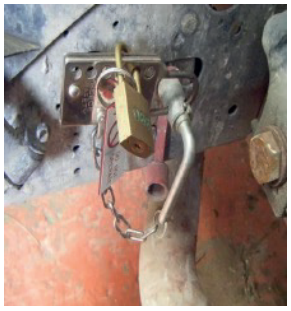
Lockout Devices

Lockout devices are items of equipment which, once put in place and locked off, prevent the operation and activation of switches, buttons, valves, and the reconnection of electrical circuits and hydraulic or pneumatic systems. They are generally used where the direct use of padlocks or hasps cannot be used to prevent activation/operation of the equipment. Once in place the lockout devices are then able to be padlocked/hasped as shown.

The pieces of equipment shown above are examples of the types of equipment available. Please consult your equipment suppliers for the most appropriate type of lockout device for your requirements.

Below are examples of lockout devices used on mobile plant


Tags

These provide information to employees and record key facts such as when the lock out took place and by whom. These can be colour-coded, especially where is there is more than one lock out authority, i.e., different staff doing their own maintenance regimes on the machine concerned.

Tags should be constructed of materials suitable and durable enough for the use for which they are intended. Alternatively, they may be held in plastic sleeves to protect them in hostile environments. Depending on your company requirements, tags must either be attached to each individual personal padlock, or they can be attached to each energy isolation point via the multi-hasp. The tag(s) must be clearly visible and not be able to be removed until the isolation event is completed.

Further parts of the equipment where hazards could arise are also to be tagged, to warn and point out the special state of the equipment.

Caution: Tags do not replace proper equipment isolation processes!

Try Out

Before conducting any tasks, all relevant switch mechanisms of the equipment are to be checked to prove the integrity and effectiveness of the isolations.

Examples of try out include but are not limited to:

- Checking for the presence of voltage for electrical isolations.
- Attempting to start the machine or equipment using the same method as in Turn Off / Shutdown.

Caution: Even if the equipment is isolated correctly, switch mechanisms should be left in the "off" position to prevent an unintentional start up during the restarting process.

Caution: Emergency stops must be in the operation "on" position when the isolator switch is turned off and isolated and the isolation is checked for effectiveness (try out). If the emergency stop is in the "off" position the isolation check is checking the control circuit and not the power supply isolation.

Caution: Try out must never be attempted if personnel are already working on isolated equipment. If joining an isolation event mid-task, reasonable checks must be made to confirm try out was attempted, e.g., check isolation record/register and confirm with colleagues. If there is any doubt, the task must be suspended, and measures taken to confirm the isolation event, e.g., personnel cleared from machinery, controls put in place, e.g., temporary guards, and try out process completed, where safe to do so.

Stored or residual energy shall be relieved, chocked, blocked, bled, restrained or otherwise rendered safe (zero energy state). (Note this may include consideration of the product, e.g., reinforcement wires under tension, as well as the equipment).

If there is a risk of re-accumulation of stored energy to a hazardous level, verification of zero energy state should be performed at regular intervals until the task is complete or the risk no longer exists.

Caution: If there is an unexpected presence of any energy source during the test/relief stage, the isolation event shall stop, and the relevant supervisor / manager must be informed. An investigation should take place in order to identify where a failure of the isolation procedure/event occurred.

Commence Work

Carry out the required work to complete the task as per the risk assessment and safe working practice requirements. Monitor the work area for new / additional hazards.

Complete Work

Ensure all work has been completed, including the fitment of guards (if applicable).

Inspect and Restore

- Verify that all individuals are clear of the work area from within and around the affected equipment.
- Further precautions via barriers/signage may need to be in place where danger could arise during restoration, e.g., work on high pressure/temperature systems where rapid expansion could cause leaks, extensive modifications to switch/control panels where there is a potential risk from arc flash, or during the removal of props, where parts of the machinery may move.
- Confirm equipment is safe to operate by visually inspecting the work area in and around the affected equipment to ensure all tools, material and debris have been removed and all guards and other safety devices are in place.
- All locks and tags are to be removed **by their owners.**
- For complex isolations the Isolation Supervisor/Controller shall ensure that all personal locks are removed prior to removal of their lock(s).
- All relevant paperwork (isolation register/ record) should be signed off to confirm it is safe to re-energise.
- Where applicable, cancel the Permit to Work.
- The equipment is to be restarted.
- Proper operating conditions are to be checked.

Forced Removal of a Padlock from an Isolation: There may be rare or unusual circumstances that require an isolation lock to be forcibly removed from the isolation point. Examples are as follows:

- Person applying padlock has left site and not removed it.
- Person applying padlock has been taken ill.
- Person applying padlock has lost the key.
- Key broken in lock.

Prior to any forced removal of a padlock from an isolator, extensive enquiries including physical checks of the work area must be made to ensure that no other alternative is available but to forcibly remove the padlock.
The appropriate forced removal of a padlock authorisation form must be completed to control and manage the forced removal of a padlock.
An investigation should take place to identify the cause of the need to forcibly remove the padlock.
The person to whom the removed padlock belonged must be informed of the forced removal of the padlock BEFORE they enter the workplace at their next visit.

5 TRAPPED KEY / KEY EXCHANGE SYSTEMS

Trapped key interlocking, where designed correctly, can ensure that a process is followed and cannot be circumvented or short cut. The transfer of a key ensures that wherever personnel find themselves, in either starting or shutting down operations, they can be assured that they are safe. A key is used to enable power to be switched on to the process and remains trapped whilst the machine is running. The only way to remove the key is to isolate the hazard. This key is then used to gain access to the dangerous area and remains trapped in position while the

gate or door is opened. The key can only be removed when the gate or door has been shut. In this way the key is either trapped when the machine is running, and access cannot be gained, or the key is trapped while access is gained, and the machine cannot be started.

It is important when trapped key systems are incorporated into the machinery or equipment to be isolated that full control of the isolation event is maintained at all times whether the isolation is a simple or complex isolation event. See your individual company rules and procedures for further information.

A trapped key system can be used for isolation events when the power isolator is mechanically interlocked with an access key, in such a way that the key cannot be released to gain access into the interlocked area until the isolator is in the OFF position, and no other sources of energy are present. The system selected shall ensure the isolator cannot be overridden under any circumstances when the access key is released.

A single point isolation event can be carried out by a single individual using a trapped key system. When the isolator key is released and used to allow the guard to be unlocked this releases a second key. The second released key shall be retained by the person at all times. The isolator key can only be released from the guard when both the second key has been returned and the guard has been closed and locked. This may be sufficient to maintain control and prevent re-energisation. An additional safeguard would be to also ensure that a padlock is fitted to the isolator. See your individual company procedures and rules for further information.

Where multiple personnel are involved in the task then all personnel should then fit their locks to the main isolator. This will ensure the system cannot be re-energised until all locks have been removed.

Other simple isolation events may require that the released key shall be trapped within a key exchange system. A key exchange system can also be used to ensure, via the sequential release of keys, that activities take place in the correct order. For example, the activites might be first isolation(s), then stopping (if run down takes time), then venting of stored energy and chocking of parts that can move under gravity, before access into a machine via the guards is permitted. All persons involved in the task shall then remove a key from the key exchange box and retain it on their person at all times. Alternatively, the keys can be placed in a lockout key box and controlled using the lockout key box isolation method.

For complex isolations the Isolation Supervisor/Controller shall remove the trapped key, attach a tag, multi-hasp and padlock to the isolator. The isolation control should then follow one of the appropriate isolation methods to control the isolation event and ensure all individuals have control over the isolation.

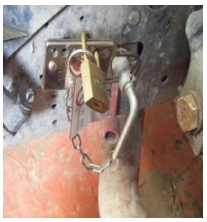
Where there is an instance of not enough keys, or there is no key exchange system, any person involved in the task, shall attach a tag, multi-hasp and personal padlock to the isolator.

All isolation records/registers should still be completed with full details of the isolation event.

Note: Due to the wide variety of system designs it is essential that site and equipment specific isolation procedures are developed, communicated and displayed at appropriate locations.

6 MOBILE PLANT

Including front end loaders, dumpers, excavators, mobile processing, crushing and screening plant.



Mobile plant can be isolated using:

- Lockable battery isolators.
- Lockable isolation boxes – Taking care not to cause a short circuit, first remove the negative (earth) terminal, then the positive terminal from the battery and place in a lockable isolation box.
- Unique removable battery isolator keys.

The following general guidance should be supported by site specific safe working procedures applicable to the type of mobile plant where an isolation event is required.

- Ensure there is a suitable and sufficient risk assessment and safe working procedure in place for the isolation and the task to be undertaken.
- Follow the manufacturer's recommendations ensuing the plant is secured from movement by applying the primary and secondary braking system(s) and chock the wheels, or drums (rollers) as necessary.
- Apply any secondary security features, as necessary, where maintenance/repairs/work is to be carried out in the articulation area. Engage transportation rams, where fitted, or provide other means where they are not and where there is a risk of the mechanism moving in the event of pressure being lost, e.g., due to a hose being disconnected.
- Switch off the ignition, remove the key and ensure all hydraulic, pneumatic and electrical circuits cease to operate and all stored energy is dissipated.
- Isolate the mobile plant or machinery from electrical sources by removing the battery isolator (where fitted) and applying a multi-hasp, personal padlock and tag. Where the isolation point cannot be locked off, the isolator key should be placed in a lock box which is, in turn, secured by personal padlocks. Where an isolator key is not fitted, the battery should be disconnected by a competent person.
- Try start.
- Where a potential risk exists due to accidental movement of the steering wheel, this should be secured with a lock out device and a DO NOT OPERATE tag.
- Where no access to the cab is required, the cab door should be locked, and keys secured, e.g., on person or in lock box.

7 PORTABLE ELECTRICAL EQUIPMENT

Portable and transportable equipment (appliances) means all electrical equipment which is or can be connected to a source of supply by a cable connected to the appliance and terminated by a plug. The equipment can include angle grinders, drills, photocopiers, computers, pressure washers, domestic type equipment, etc.

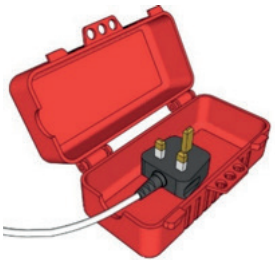
Where the plug of the portable electrical appliance can be removed from the socket and controlled locally, i.e., within direct sight of the equipment and the plug can be retained at the point of work, and the person carrying out the task does not leave the equipment unattended, e.g., changing an angle grinder wheel, then:

The item may be isolated by disconnecting from the power source (battery removed). This should be done prior to any covers being removed.

Any stored energy should be dissipated in a controlled manner.

Where the item of equipment cannot be worked on locally with the plug alongside, e.g., electrical cable fed through a wall to another room:

- Follow the general isolation principles set out earlier.
- Disconnect the plug from the socket.
- Place plug in a lockable 'plug box'.
- Apply multi-hasp, personal padlock and tag.
- Ensure all stored energy is dissipated.
- Try start.



8 PIPEWORK AND ASSOCIATED EQUIPMENT

The risk assessment for the task must identify potential impacts on full or partial isolation of a system, ensuring the safety of the system (relief valves, etc.) and personnel working upon it.

Given the complex nature for safe isolation of pipework the HSE publication 'Safe isolation of plant and equipment' contains a selection tool to aid in the assessment and selection for isolation of pipework. Please refer to the publication for guidance. However, in summary, before carrying out any intrusive work:

- Minimise any potential energy within the pipework.
- Shut down all relevant plant.
- Dissipate built up energy.
- Isolate energy at source (taking into account upstream and downstream sources).
- Consider other precautions which may be necessary if the hazards in the pipework include oxygen deficient or toxic atmospheres.

9 COMPETENCE OF INVOLVED PERSONS

Only persons who are competent through a combination of skills, knowledge, experience and training should be authorised to perform equipment isolation.

The required competence must be defined and checked by the company prior to assigning any equipment isolation task. (Please refer to your company procedures on isolation and lock off as well as training and competence to undertake tasks.)

10 CONTRACTORS / EXTERNAL COMPANIES

If contractors, subcontractors or any third party are directly or indirectly engaged in equipment isolation processes, it is crucial that all technical, organisational and personal responsibilities are clearly regulated, controlled and documented to ensure safe working conditions for all involved persons. (See your company procedures for control of contractors.)

mpa British Precast

The Old Rectory,
Main Street, Glenfield
Leicester LE3 8DG

Tel: 0116 232 5170
Email: info@britishprecast.org
www.britishprecast.org

2019