
ISOLATION AND TAG-OUT PROCEDURES

GUIDELINE



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FOREWORD

This Department of Industry and Resources (DoIR) guideline is issued to assist in the development of procedures to effectively isolate plant from its energy source prior to persons commencing work on it, or which is to be removed from service because it is unsafe or may be damaged if it is operated.

The scope of the guidelines is confined to the general use and application of accident prevention tags known as personal DANGER tags and equipment OUT OF SERVICE tags.

The purpose of the guidelines is to describe well established principles from which employers can develop effective isolation policy appropriate to particular minesite conditions. In each section key points have been summarised to assist in any review or auditing of existing systems of work. The procedures and recommendations outlined in these guidelines should not be regarded as regulations, and compliance with them is not mandatory.

These guidelines have been compiled from a review of existing work practices and with input from experienced mining industry practitioners. Further comments or suggestions relating to improvement of the document are encouraged.

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1.0 INTRODUCTION

Isolation of plant to facilitate activities such as maintenance, installation, inspection, testing or cleaning is a normal everyday event carried out by mining industry employees. Isolation will necessarily involve the de-activation of all relevant energy sources, and is also likely to require the implementation of other safeguards. Having correctly identified and operated the appropriate isolating devices, and where a person may be injured if the devices do not remain in the safe position, it is paramount that a personal 'DANGER' accident prevention tag be attached to each isolating device.

Similarly, equipment OUT OF SERVICE accident prevention tags are a recognised means of preventing the use of plant that is unsafe or which may be damaged if operated.

Use of accident prevention tags in this manner is an essential practice, and commonly forms an integral part of other more specific safe systems of work.

2.0 RELEVANT LEGISLATION AND STANDARDS

Reference should be made to relevant legislative provisions and standards.

2.1 Duty of Care

Section 9 of the Mines Safety and Inspection Act 1994 includes obligations on employers to provide and maintain workplaces, plant and systems of work such that employees are not exposed to hazards.

Section 10 of the Mines Safety and Inspection Act 1994 requires employees to take reasonable care to ensure their own safety and health, and to avoid adversely affecting the health and safety of others.

2.2 Employer to Prevent Unsafe Use of Plant

Employer to Prevent Unsafe Use of Plant

Regulation 6.21 of the Mines Safety & Inspection Act and Regulations 1995 states:

An employer must ensure that:

- (a) plant at the mine is used only for the purpose for which it was designed, unless the employer has determined, and a competent person has assessed, that a proposed change in use does not present an increased risk of exposure to any hazard;
 - (b) measures are provided to prevent (as far as practicable) unauthorised interference, alteration or use of plant, which is capable of making the plant hazardous or a greater hazard;
 - (c) subject to paragraph (d), where access to plant is required for the purpose of maintenance, cleaning or repair, the plant is stopped and one or more of the following are used to reduce the risks of exposure to any hazards:
 - (i) lockout or isolation devices;
 - (ii) danger tags;
 - (iii) permit-to-work systems;
 - (iv) other control measures approved by the State mining engineer;
- and
- (d) where it is not practicable to carry out cleaning or maintenance with the plant stopped, operational controls that permit controlled movement of the plant are fitted.

2.3 Australian Standard 1319

This Standard entitled 'Safety signs for the occupational environment' briefly describes recommended size colour and format of accident prevention tags.

3.0 DESCRIPTION OF TAGS

The accident prevention tags described in these guidelines are:

- ◆ personal DANGER tags; and
- ◆ equipment OUT OF SERVICE tags.

Both kinds of tag are commercially available, and can be printed on waterproof paper in standard sizes, colours and format; detachable 'reminder' sections may be provided for control purposes.

The background colour of personal DANGER tags should be white, and yellow is preferred for equipment OUT OF SERVICE tags. Printed text and legends should be coloured black.

Personal DANGER tags must display a recognised DANGER symbol on each side, and equipment OUT OF SERVICE tags must boldly display the words OUT OF SERVICE on each side. Both tags must prominently show a DO NOT OPERATE message on each side.

Details to be entered on OUT OF SERVICE tags and on (disposable) DANGER tags should include an equipment reference, date, time and most importantly the name of the person attaching the tag. OUT OF SERVICE tags must indicate the reason for placing the tag, and may also identify the work group or section responsible. Non-disposable DANGER tags need only identify the owner of the tag.

Tags should be durable, not less than 60 x 120 mm in size, and provided with a reliable means for attachment to plant.

Key Points

System of work should provide for:

- ◆ *the use of both personal DANGER tags, and equipment OUT OF SERVICE tags;*
- ◆ *tags which conform closely to these guidelines;*
- ◆ *adequate supplies of tags to be readily available in convenient locations.*

4.0 USE OF PERSONAL 'DANGER' TAGS

Personal 'DANGER' tags attached to isolation devices signify that persons are currently engaged in work on the plant, and that it is likely that those persons will be injured if the isolating devices are not maintained in the safe position.

4.1 Attaching Personal DANGER Tags

Prior to commencing work in, on or about any plant which could cause injury, it is essential that each individual:

- (a) ensures that all relevant energy sources have been switched off, and that all necessary safeguards have been put in place, including accounting for any stored energy sources.
- (b) establishes that the isolation is effective.

- (c) attaches his own properly completed personal DANGER tag to each isolation device.
- (d) Seeks assistance where doubt arises

Personal DANGER tags should always be fixed to isolation devices that are in the 'off' or 'safe' position, and should never be placed by any one person on behalf of another person.

It should be noted that some systems of work restrict the isolating function to nominated personnel and only allow DANGER tags to be placed on isolation devices already fitted with special purpose tags commonly referred to as 'isolation tags.'

4.2 Removing Personal DANGER Tags

Personal DANGER tags should be removed only by the person whose name is written on the tag.

Removal of personal DANGER tags from isolating devices should be carried out as soon as practicable after completing the work, and in every case should be removed prior to leaving the worksite at the end of the shift.

Should a person fail to remove a personal DANGER tag prior to leaving the worksite and the equipment to which it is attached is required for use, the person immediately in charge of the plant and the work group must, if unable to locate or contact that person, verify beyond doubt that the person is not in, on or about the plant, prior to authorising reactivating of the equipment.

Where work on plant is not completed by the end of a working shift and the plant is required to remain isolated, arrangements must be made for OUT OF SERVICE tags to be placed on each isolating point prior to the removal of personal DANGER tags.

Key Points

Personal DANGER tags must:

- ◆ *be attached to all isolating devices for the purpose of preventing injury to persons undertaking work;*
- ◆ *be attached only to isolating devices that are in the 'off' or 'safe' positions;*
- ◆ *be attached and normally removed only by the person whose name is on the tag;*
- ◆ *have all information clearly entered on the tag prior to attachment;*
- ◆ *be securely attached at the isolation point in a prominent position by each person prior to commencing work;*
- ◆ *be removed after completing the work and prior to leaving the worksite at the end of a working shift;*
- ◆ *be replaced with equipment OUT OF SERVICE tags before removal when work is incomplete;*
- ◆ *not be used in place of an equipment OUT OF SERVICE tag.*

System of work must detail emergency procedures which allow authorised persons to remove another persons personal DANGER tag.

Plant, equipment and isolating devices displaying a personal DANGER tag must not be used, switched manipulated or interfered with while the tag is in place.

5.0 USE OF EQUIPMENT 'OUT OF SERVICE' TAGS

Equipment OUT OF SERVICE tags are used to signify that an item of plant is not to be used.

5.1 Attaching Equipment OUT OF SERVICE tags

OUT OF SERVICE tags should be attached by competent persons having specific knowledge relating to the plant. However, this should not preclude any other person from attaching OUT OF SERVICE tags in emergency situations where it is apparent that the continued use of equipment could be dangerous.

OUT OF SERVICE tags should be placed on the devices which isolate the energy sources only when those devices are set in the 'off' or 'safe' position.

Any stored energy source must also be accounted for by isolation or controlled discharge of the stored energy.

Prior to attaching an OUT OF SERVICE tag, all required details on the tag must be clearly and indelibly entered in the spaces provided, with emphasis given to the reason for placing the tag.

Tags must be securely fixed to the respective isolation point, so as to be clearly visible.

5.2 Removing Equipment OUT OF SERVICE tags

Except in an emergency, OUT OF SERVICE tags should be removed only by an authorised person who is both familiar with the equipment and fully conversant with the reason that the tag was placed. Some systems of work provide for OUT OF SERVICE tags to be removed only by persons from the same work group responsible for placing the tag.

In the absence of any personal DANGER tag, removal of an OUT OF SERVICE tag effectively releases plant or equipment for use, and must not be done prior to ensuring that:

- (a) all persons known to have been working on the plant are clear of the equipment;
- (b) an inspection of the plant indicates that all machinery guards are in place, that all protective devices are functional, that all maintenance tools and aids have been removed, and that the equipment is safe for normal use.

OUT OF SERVICE tags are intended to convey a clear DO NOT OPERATE warning, and that failure to comply may result in damage to the equipment and/ or cause injury to persons. Therefore, it is essential that isolating mechanisms with OUT OF SERVICE tags attached are not switched, manipulated, or interfered with in any way while these tags are in place.

OUT OF SERVICE tags must not be relied upon to provide personal protection, as they may be removed at any time by other authorised persons.

Whenever work is required to be undertaken in on or about equipment or machinery that could cause injury, personal DANGER tags should be employed.

Key Points

Equipment OUT OF SERVICE tags must:

- ◆ *in the absence of any personal DANGER tag, be attached to all plant or equipment which is unsafe to be operated;*
- ◆ *normally be attached by competent persons and removed only by authorised persons;*
- ◆ *be attached only to isolating devices that are in the 'off' or 'safe' positions;*
- ◆ *have all required information clearly entered on the tag prior to attachment;*
- ◆ *be securely attached at the isolation point in a prominent position;*
- ◆ *not be removed until it is safe to do so;*
- ◆ *not be used in place of a personal DANGER tags.*

Plant, equipment and isolating devices displaying an equipment OUT OF SERVICE tag must not be used, switched manipulated or interfered with while the tag is in place.

6.0 DESTRUCTION OF TAGS AND ACCIDENTAL REMOVAL

It is intended that tags manufactured from paper be regarded as disposable and be destroyed immediately after use to prevent any possibility of reuse.

Any person who finds an undestroyed tag should assume that it has become unintentionally detached from an isolation point, place a substitute tag, and immediately refer the matter to the person named on the tag or a responsible person.

The same procedure should apply if a person accidentally removes another person's tag from an isolation point.

Key Points

System of work must provide for:

- ◆ *disposable tags to be destroyed immediately after use; and*
- ◆ *safe procedures in the event of a tag being accidentally removed or becoming unintentionally detached.*

7.0 ISOLATION AND USE OF PADLOCKS

Prior to commencement of work on any plant that requires to be isolated, and prior to removal from service of any equipment regarded as unsafe, it is essential that thorough consideration be given to how the isolation is to be carried out and the means by which the effectiveness of the isolation can be proved.

7.1 Isolation Practice and Devices

Hazards associated with conventional energy sources such as electricity, steam, gas, compressed air and hydraulic systems are normally readily apparent. Hazards resulting from stored energy sources such as charged springs, sudden release of pressure, unexpected motion, fuming, heat, radiation, chemicals and the like, may be less obvious, and must be accounted for.

Isolation of plant may typically involve:

- (a) the operation of electrical switches, removal of fuses or battery terminals, and the withdrawal of decontactor plugs from electricity supply sockets.
- (b) closure of service or process valves, and the blanking of pipelines.
- (c) securing of hatchways, manholes and other entries to confined spaces.
- (d) the provision of restraints, chocks, locking pins and other fastening devices.
- (e) erection of barriers and other safeguards.

Whatever means are selected to effect an isolation, it is critical that they be correctly identified, and can be positively relied upon to provide the required degree of protection.

Conventional emergency stop buttons, conveyor lanyards, and other similar control circuit devices are not suitable for use as a primary means of isolating electricity supplies. In general, electrical systems should be isolated by operating main switches, circuit breakers, decontactors, or other devices which provide a positive break in the main supply conductors.

Having selected and operated the appropriate isolating devices, it remains to prove that the devices have functioned correctly. This may be accomplished by visual inspection, opening drain valves, attempting to start or operate the equipment, and can be supported by observing indicator lamps, use of test instruments or other appropriate means.

Proving the effectiveness of an isolation is essential, many injuries have resulted from defective isolators, incorrect labelling, and quite simply switching off the wrong isolator.

7.2 Locking of Isolation Points

There are some situations such as public places where the use of isolation padlocks is appropriate.

In the workplace the requirement for isolation padlocks should be determined on the basis of a risk analysis of the work process.

Use of isolation padlocks should be regarded as an additional safeguard which is supplementary to an 'attached' DANGER tag or OUT OF SERVICE tag and under no circumstances should isolation padlocks be used in place of or as a substitute for DANGER tags or OUT OF SERVICE tags.

Scissor locks or multi-locks are commercially available, and allow any number of padlocks to be fitted to one isolation point.

Key Points

System of work must provide for:

- ◆ *the availability and correct selection of appropriate isolating devices;*
- ◆ *account for stored energy systems;*
- ◆ *proving the effectiveness of isolating devices;*
- ◆ *clear understanding of any use of isolation padlocks; and*
- ◆ *isolation padlocks not to be used in place of DANGER tags or OUT OF SERVICE tags.*

8.0 SUPPLEMENTARY TAGGING SYSTEMS

8.1 Common Tagging Points

Isolation of some items of equipment or workplaces may involve the switching of numerous isolating points together with the implementation of a complex series of safeguards. Situations of this kind require detailed consideration and systems of work such as the use of common tagging points should result from a thorough risk analysis of all the hazards involved.

Common tagging points are normally used in conjunction with a prepared isolation procedure, which avoids the necessity for all persons working on an item of plant to attach individual personal DANGER tags to each and every isolation point. The system operates in a manner such that one or more authorised persons carry out the necessary isolations and endorse the isolation procedure to this effect.

The procedure is then prominently displayed at the 'common tagging point' usually positioned adjacent to the plant, and allows workers to attach their individual personal DANGER tags to the common tagging point. Rules associated with the permit may require each worker attaching a tag to also sign the permit prior to commencing work and after completion of the work.

Typical applications for the use of common tagging points include entries to confined spaces such as process tanks and vessels, and work in or about rotating plant such as crushers, scrubbers, kilns and the like.

8.2 Maintenance Tags

Other names for this category of tag include 'RESTRICTED OPERATION', 'COMMISSIONING', 'TESTING/ADJUSTMENT', and 'CALIBRATION'.

Maintenance tags perform a very different function from that of the 'DANGER' and 'OUT OF SERVICE' tags already described.

A point to note with MAINTENANCE tags is that they can be placed on isolating devices that are in the 'on' or 'operating' positions, and the isolating points may be manipulated by authorised persons while the tags are still attached.

Maintenance tags are intended to provide exclusive control of equipment, they do not provide personal protection.

Key Points

Systems of work utilising 'Common Tagging Points' must:

- ◆ *result from a thorough risk analysis of all the hazards involved.*
- ◆ *inform persons placing tags on the common point of all the isolations that have been effected.*
- ◆ *be consistent with recommendations detailed in these guidelines.*

9.0 ADMINISTRATION

9.1 Policy and Procedures

An essential part of all safe systems of work, including Isolation and Tag-out, is to ensure that policy matters and procedures are clearly documented and authorised. Careful detailing of specific requirements not only informs and conveys an understanding, it provides the basis for periodic review and further improvement.

Procedures need to be fashioned such that the rules and objectives are clear and will be readily adopted by employees.

9.2 Instruction and Training

Isolation and Tag-out rules and procedures may vary from one mining operation to another. It is therefore essential that all involved persons are fully instructed in particular systems and procedures.

Key Points

System of work must provide for:

- ◆ *formal and detailed documentation of policy;*
- ◆ *periodic review of policy details;*
- ◆ *authorisation of policy and amendments by Registered Manager or more senior corporate officer;*
- ◆ *ready access to policy details by persons involved;*
- ◆ *training assessment and record keeping consistent with MSI Regulation 4.13;*
- ◆ *clear understanding of authority levels;*
- ◆ *investigation of accident and incidents caused by failures to properly isolate.*