QNJAC Guidance

SITE ENERGY ISOLATION SELF AUDIT

Introduction

This guidance has been produced by a working group of QNJAC which comprises of industry experts from varied backgrounds, the Trade Union and HSE.

This document does not consider the implications for isolation and lock-off procedures posed by systems which incorporate trapped key or captive key elements. An interlock system should not normally be used as a means of isolation, unless it has been specifically designed for the purpose, such as some trapped key systems. For this reason, care is needed and the advice of a competent person should be sought to ensure your isolation and lock-off procedure for such systems is fit for purpose. Further guidance is available in PD 5304:2014 “Guidance on safe use of machinery” available from BSI.

The purpose of this document is to provide a structured framework to enable organisations to carry out self-audits of isolation procedures to prove their effectiveness as well as identifying weaknesses in the system that could lead to serious injury or loss of life. It is can be used and adapted by any organisation operating machinery that needs to be isolated from sources of power, typically for maintenance purposes.

Serious accidents can and do occur. There have been numerous serious accidents, many resulting in fatal injury, where machinery has not been isolated from all sources of energy and has started either intentionally or unintentionally. Systems for achieving effective isolation consist of many elements including;

- Provision of suitable means to isolate equipment and test the effectiveness of isolation that is available and clearly and unambiguously labelled
- Maintenance of equipment
- Training and competence of individuals
- On the job assessment of knowledge
- Supervision and refresher training
- Audit and review of effectiveness of control measures

All elements combine to form a safe system of work. A failure of one or more critical elements may lead to a complete failure of an isolation system and the consequences can easily be fatal. Therefore, it is essential to consider all of the individual elements that make up the system and routinely monitor their effectiveness. To help achieve that, this guidance provides a useful set of questions to ask in order to check the integrity of systems provided to ensure safe isolation including consideration of the people who work within those systems and procedures. Human error is a significant factor in many accidents involving failure to isolate correctly. A procedure in itself

will not prevent an accident. Do not ignore the people who are required to make isolations or supervise the work of other that may involve isolating plant.

The findings of the audit can be recorded and used to write an action plan and a record made of the actions taken as a result of the audit. The question set can never be totally comprehensive in all circumstances, but it represents a good starting point that will be adequate in many situations.

Scope

The self-audit is not exclusive to the quarry industry. The same risks exist across a wide range of industries and the guidance therefore has a use in many industries in the mineral products sector.

The guidance is biased towards isolating electrical power simply because this is the most common source of power for machinery and equipment in the mineral products industry. However, it is important to consider all sources of energy and include them in the audit process. The questions in the self-audit do provide prompts to consider all sources of energy.

Carrying out the audit

Allow enough time to carry out the audit. At large sites it is likely that the audit will have to be carried out over a period of time. Plan the time and stay to plan as far as possible. The audit does not have to be done in one go, so be realistic. The audit process is part of the function of supervision and monitoring so it is useful if it is seen to be a regular on-going process rather than a one-off event.

Remember that the purpose of the audit is to uncover weaknesses in the system. Finding weaknesses is therefore a success and action taken as a result of the audit may prevent serious accidents or death.

Planning the audit is critical. The size of the site and complexity of plant and equipment is likely to be a significant factor in terms of the amount of planning required. However, regardless of the size of the organisation there are key considerations at the planning stage. For example;

- Involve the workforce. Ensure that the workforce is fully briefed on the purpose of any audit and encourage them to become involved.
- Remember that it is often the workforce who are the most informed.
- Encouraging a ‘just culture’ will help you discover more.

People are critical to the audit:

- Decide who will carry out the audit, it may be an individual or teams.

- Take time to brief them and train them if necessary.
- Check their competence and understanding of the process.
- Make time available to them.

There are a number of ways the audit can be carried out. The questions move through a logical sequence and follow under the headings of equipment, processes and people. There is also flexibility to split the task of auditing amongst members of a team with responsibilities for different areas of the site, for example. It doesn't matter how the audit is carried out or over how long a period, it is the rigour and integrity that matters.

Remember contractors. They should be included in the audit process. Regular contractors may be responsible for isolating plant and machinery so involve them in the audit process including any planning so that they can contribute their knowledge and understanding. For other contractors check that procedures for managing isolations are in place, understood and effective.

Useful references

QNJAC, The Management of Electrical Safety in Quarries, Associated Plant and Equipment. (available at qnjac.co.uk and safequarry.com). All electrical systems provided for achieving isolation need to be inspected and maintained. This document provides useful guidance on schemes of inspection and maintenance.

Managing for Health and Safety HSG65 . Includes the widely recognised and used PLAN, DO, CHECK, ACT model to represent good management of Health and Safety. Checking or auditing plays an invaluable part in feedback to inform organisations of how deeply imbedded systems and procedures are in reality.

The Safe Isolation of Plant and Equipment HSG253. Primarily aimed at high hazard industries but contains some useful references including an alternative audit checklist that may inform organisations with complex processes looking beyond this guidance.

The Mineral Products Association, MPA, have produced guidance on LOTOTO which has widely been accepted as good practice in the mineral products industry. Individual copies are available, and it is also available to download from safequarry.com.

SITE ENERGY ISOLATION – SELF AUDIT

FACILITIES & EQUIPMENT			
QUESTIONS	**Y**	**N**	**ACTIONS**
1. Is there an accessible isolating device for all machinery, plant and equipment, clearly marked that is provided with a facility for locking in the 'OFF' position?			
2. Is the operation of switches, valves and machinery clearly labelled and able to be cross referenced to the item of plant, motor etc that it isolates?			
3. Has it been confirmed with a suitably qualified person that electrical isolation systems cut off the energy supply rather than control circuitry?			
4. Is it possible to isolate all forms of stored energy?			
5. Is there sufficient and suitable equipment, padlocks, hasps, warning signs and isolation tags available at all points of isolation and are they identified in an inspection regime?			
6. Are master keys and duplicate keys for padlocks prohibited?			
7. Have checks been made to ensure isolators cannot be locked in the 'on' position? Additional controls will be required for High Voltage switch gear, for example, that is required to be locked in the 'on' position.			
PROCESS			
QUESTIONS	**Y**	**N**	**ACTIONS**
8. Do the isolation procedures clearly identify all the points of isolation for all plant equipment? For example:			

• Do they ensure machinery cannot be operated while people are exposed to danger? • Are they specific and sufficiently detailed for all different equipment that may need to be isolated, for example, PLC control systems and mobile processing plant? • Do they take account of all isolation tasks, i.e. preparation work (releasing stored energy), removal of guarding, monitoring, testing and reinstatement of machinery? • Do they consider the isolation requirement for all sources of energy, e.g. electrical, gravitational, hydraulic, pneumatic, chemical, heat and how it is to be achieved? • Do they consider machinery that may operate automatically due to sensors or timers?			
9. Are risk assessments and procedures reviewed and in particular whenever there is a change in activity that has not been considered previously?			
10. Does guarding and isolation system ensure it is not possible to enter a live area from an isolated area? Risk assessment should include all types of protection such as light curtains.			
11. Are there procedures in place for more complex isolations? These are where a large number of energy isolation devices or authorised individuals are involved. The complex isolation procedure should cover: • Extended energy isolation period (of more than one shift). • Complicated energy isolation. • Highly sequenced equipment or high-risk activities.			

12. Do the procedures include the requirement to attempt a safe 'try out' step to confirm isolation is effective? Are there procedures for when it is not possible to try out? Is it clear where the 'Test Button' is? Is it clear what mode the plant must be in for the 'Try Out' step to be effective? For example, attempting to start the plant out of sequence when the controls are in sequence will not give a true indication. Is it part of the procedure for all personnel to withdraw to a safe position for 'Try Out'.			
13. Do procedures include the requirement for an authorised individual to ensure equipment cannot be re-energised unless returned to a safe state?			
14. Where the isolation has to be applied for more than one shift, are there handover procedures in place to ensure the isolation remains effective with everybody locked out?			
15. Is there a formal check to ensure equipment has been returned to a safe condition before the isolation is removed?			
PEOPLE			
QUESTIONS	**Y**	**N**	**ACTIONS**
Organising			
16. Is there a system to develop and maintain the required competencies for isolation work that covers: • Identification of training needs for managers, supervisors, risk assessors, employees and contractors. • Verification of competence. • Keeping a record on site of competent and authorised persons.			

• Performance standards for training.			
17. Do people appointed to carry out isolations show understanding of the types of isolation that are made on site, the way that these can go wrong and how they can mitigate the consequences of these failures?			
Measuring Performance			
18. Are performance standards for isolation systems set and monitored?			
19. Does active monitoring include • Supervision, i.e. systematic direct observation of work and behaviour. • Assessment of compliance with training, instruction, operating procedures. • Inspection of samples of work in progress and completed. • Monitoring of quality of this checking?			
20. Does reactive monitoring include • A system for reporting incidents and near hits/misses which involve isolation deficiencies? • Incident investigation to determine both immediate and underlying management related causes, including the adequacy of the installation facilities and human factors. • Communication through the organisation of lessons to be learned, and improvements to procedures to prevent reoccurrence?			
Audit			
21. Is an audit programme in place and implemented?			
22. Are significant (positive and negative) results of audits communicated to 'controlling mind' level of the organisation?			

23. Are active improvement plans prepared and implemented?			
24. Do senior management review the overall isolation system at defined intervals against policy objectives, taking information from monitoring and audit activity.			
25. Are the review mechanisms responsive to considering lessons from relevant industry incidents and to considering impacts of organisational change?			
ALL 'NO' RESPONSES SHOULD BE ASSIGNED AN IMPROVEMENT ACTION. WHERE THIS IS NOT FELT POSSIBLE, THE ISSUE SHOULD BE ESCALATED TO THE MANAGEMENT TEAM AND H&S SPECIALIST.			