

Energy Isolation Management Plan

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1. Introduction

1.1 Purpose Statement

The purpose of this Management Plan is to provide direction for the effective use of isolation, lockout, tagging, de-energizing, and testing of systems to ensure safety, and is applicable to all WesCEF Exploration work sites and workers, including contractors.

This management plan relates to the control of energy where activities are being performed on both fixed and mobile plant and equipment.

1.2 Scope

To establish the necessary precautionary measures to reduce risk to personnel, the environment, and/or plant and equipment located on WesCEF Exploration worksites, and to ensure compliance with relevant statutory regulations as detailed in the Work Health and Safety Act 2020 and Work Health and Safety Regulations (Mines) 2022.

2. Responsibilities

2.1 Summary of Responsibilities

The roles identified in this table hold specific responsibilities in relation to this activity.

Role title	Summary of Responsibilities
Senior Site Executive	<p>Ensure that energy installations at the project are designed, installed and maintained to minimise the potential for electrical shock, burns, injury, explosion, fire, overheating, and release of hazardous energy/material or mechanical damage.</p> <p>Ensure that persons who perform work under this Management Plan are authorised to do so.</p> <p>Approve isolations that are not able to be performed by the application of a lock.</p> <p>Authorise removal of personal lock as per Section 7.</p>
Supervisors	<p>Ensure that plant, equipment and energy sources within their area of accountability can be mechanically isolated and physically locked.</p> <p>Ensure that written isolation procedures are developed for designated systems, plant and equipment within their areas of accountability.</p> <p>Ensure that isolation breaches within their areas of accountability are investigated and corrective actions implemented.</p> <p>Develop implementation plans to remove the circumstances where padlocks cannot be applied to a piece of plant or equipment in their area of responsibility.</p> <p>Ensure that employees who perform isolations are:</p> <ul style="list-style-type: none"> - Suitably authorised - Adequately trained and are deemed competent to perform required task. - Understand the applicable procedures/ JHA.

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	<p>Ensure that written authorisation is provided for equipment or repairs where energy sources are unable to be isolated and locked out.</p> <p>Ensure that employees have sufficient resources for effective isolations of plant and equipment.</p> <p>Ensure that sufficient information, instruction, training and supervision are provided to personnel.</p> <p>Supervisors shall conduct routine inspections to ensure that the Energy Isolation Management Plan is being followed and that emergency stops or local control systems are not used as points of isolation.</p>
Employees	<p>Ensure energy sources are adequately isolated and locked out prior to work commencing and cannot be reconnected accidentally or before it is safe to do so.</p> <p>Be responsible for maintaining assigned isolation locks and tags.</p> <p>Ensure that they are trained and deemed competent in the application of their Personal Padlock.</p> <p>Ensure that they apply their lock to plant or equipment prior to starting work.</p> <p>Ensure that they remove their personal padlock upon leaving the work site, or upon completion of the work.</p> <p>Follow the "Identify, Isolate, Test, Lock" process (See 4.1 below)</p>

3. Risk Management

3.1 Hazard Identification

Energy sources that can potentially interact with fixed and mobile plant and equipment shall be controlled through the use of Energy Isolation.

Potentially damaging energy sources shall be controlled and managed prior to commencing work on, or interaction with, fixed plant or mobile equipment on site.

The need for energy isolation shall be identified through:

1. This Management Plan
2. Equipment manuals
3. Company Risk Register
4. Job Safety Analysis
5. Take 5/STOP

3.2 Hazard Analysis and Control

The release of, or exposure to, hazardous energies may lead to a range of consequences. A risk assessment shall always be conducted prior to commencing a task using the hierarchy of risk controls. In accordance with this hierarchy, the first efforts should be to eliminate the risk altogether. If this is not possible, efforts should be made to minimise the risk. Wherever practicable, the steps should be as follows:

1. Eliminate
2. Substitute
3. Isolation
4. Engineering controls

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5. Administrative controls
6. PPE

3.3 Energy Types

Energy Type	Comments on Isolation
Low Voltage (< 1,000 volt AC or < 1,500 volt DC)	Can be performed by a worker who has been deemed competent and authorised to isolate low voltage electricity. Only qualified Electricians can perform isolations on low voltage electricity that involve the exposure or work on bare copper wiring or access behind a panel or switchboard. Positive isolations shall be proven prior to work commencing.
High Voltage (> 1,000 volt AC or > 1,500 volt DC)	Isolations involving high voltage switching etc. shall only be carried out by an Authorised High Voltage Operator as part of an authorised high voltage switching program. Positive isolation shall be proven prior to work commencing.
Mechanical (The energy an object possesses due to it's motion)	Mechanical isolation is the act of removing spools, closing valves upstream and/or downstream, installing spades/blinds or the isolating and bleeding of instrument air to powered valves.
Potential (Includes gravitational, hydraulic pressure, spring tension etc.)	These isolations may require use of restraining devices or physical barriers such as slings, blocks and bars. For example, fixing of a barricade to an ore chute exit to prevent ore flowing out.
Thermal (Includes heat sources such as burners etc.)	Requires removal of the heat source and the cooling down of equipment prior to work commencing.
Chemical (includes reagent lines and equipment isolation)	Performed using mechanical isolation methods, but with a higher degree of control due to the inherent risks of chemicals or other hazardous materials. While mechanical isolations rely on a single valve to hold back energy, this is not acceptable on chemical isolations. For chemical isolations, the flow and pumps shall be shut down for the duration of the isolation; or a Double Block and Bleed facility shall be utilised; and/or an air gap and spade shall be installed.

3.4 Control Measures

General Control Measures for the hazards associated with this Management Plan include the following.

3.4.1 Training

All employees of WesCEF Exploration are required to undertake training specific to their role. Specifically related to this Management Plan includes:

1. Company induction - section on energy isolation – Identify, Isolate, Test and Lock
2. On the job training
3. Basic safety training in hazard identification, risk assessment and controls
4. Job Safety Analysis and Take-5/STOP

3.4.2 Workplace inspections

1. All operational work areas are inspected daily or more frequently as required by supervisors.
2. Records of formal workplace inspections conducted on a monthly basis are maintained and any hazards or corrective actions required are tracked to completion using the Hazard Reporting and Corrective Action Log.
3. Any work being performed on equipment at the time will have the isolations checked to ensure the process outlined in this Management Plan is being adhered to.

3.4.3 Incident Management

All incidents are to be reported verbally immediately to a Supervisor. This includes reports of near misses; not following procedure e.g. Identify, Isolate, Test and Lock; and any real or potential re-energisation of equipment during work, whether it causes an injury or not.

3.4.4 Behavior and Culture

As described in the Health and Safety Management Plan, unsatisfactory behavior is addressed through the disciplinary policy. This process is a specific intervention used to highlight and correct inappropriate or unacceptable behavior, including blatant misuse of safety equipment, or the lack of following the requirements set out in this management plan.

4. Energy Isolation Management

4.1 Isolation Process

A four (4) step isolation process is in place consisting of the following steps for working on fixed or mobile plant:

1. **Identify** – this step involves identifying the isolation point(s) required to complete the particular task;
2. **Isolate** – this step involves performing the isolation and any release of stored energy as required;
3. **Test** – this step involves testing the effectiveness of the isolation by attempting to start an isolated item of plant or ensuring no stored energy exists; and,
4. **Lock** – once the isolation has been tested in step 3 above and has been confirmed as effective then locks and personal danger tags are placed on the isolation point(s) and work can commence.

4.2 Tagging

Three types of tags are used at WesCEF Exploration operating sites. These are:

1. **Out of service** – these tags (yellow and black) are to be placed on any and all equipment that is damaged, faulty or unsafe to use. An out of service tag warns the user that either they or the equipment may be damaged if the equipment is used. An out of service tag can only be removed by a competent person servicing the equipment once it has been fixed and ready to be used.
2. **Danger** – these tags (red and white) are to be placed on all isolations along with a personal danger lock when working on machinery. The Danger tag informs personnel that someone is working on the machine and if it were to be energised, this person/s' safety is at risk. There must be one danger tag (and lock) attached to the isolation point for each person working on the equipment

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The only person who may remove a danger tag is the person whose name is on the tag, except in the rare case where the Registered Manager/ delegate may remove it (exceptional circumstances where the person is unable to remove it themselves e.g. injured, left the project site and unable to return etc.). The Registered Manager/Delegate will personally locate the worker, and ensure they are not working on the equipment before performing this removal procedure.

3. **Information** – these tags (blue) are placed on an item of equipment when the machine is deemed safe to operate however the operator needs to be aware of certain information that is not ordinarily required. An information tag can be removed when the information displayed on the tag is no longer relevant.

4.3 Procedures

Standard operating procedures exist for maintenance tasks that are considered to have a heightened health and safety risk and it is important that a defined work method is required to control those risks.

All maintenance procedures are reviewed on a regular basis to ensure they are still relevant and reflect the best way to complete the particular task.

5. Isolation Methods

5.1 Chemical Isolations

Methods used to ensure chemical isolation from potentially hazardous materials, including acids, alkalis, hydrocarbons, toxic liquids, noxious gases or carcinogenic compounds, and from air, water or hydraulic pressure potential energy are detailed below:

5.1.1 Blocking and Bleeding

The method of closing a line, duct, or pipe by closing and locking/ tagging two in-line valves and by opening and locking / tagging a drain or vent valve in the line between the two closed valves.

Note: A double block and bleed is only considered positive isolation when the pipe segment between the 2 block valves can relieve continuously to a lower pressure than what is being contained by the block valves.

5.1.2 Spade or Blank

Insertion of a suitable full pressure spade or blank in piping between flanges as close as practicable to the equipment or confined space to be made safe for working may be used as a means of isolation.

5.1.3 Closing Valves and Draining Lines

Closing Valves and draining Lines is a means of isolation involving closing and locking closed any feed valves in piping leading to the equipment or confined space to be made safe for working. Any drain valves must also be locked open and checked to ensure they are clear and not blocked.

5.2 Simple Isolations

Simple isolations are isolations that require no more than five isolation points or five personnel to be locked onto each isolation point e.g. use of a scissor hasp.

Simple isolations can include but are not limited to the isolation of mobile plant for inspections or repair, or the isolation of low voltage electricity.

5.3 Group Isolations

Group isolations are when there are more than five isolation points or where more than five people are required to be locked onto each isolation point. Group isolations shall be conducted with the use of a lock box. Personnel performing work in a group such as this, shall ensure that their padlock is placed on the lock box prior to work commencing.

6. Live Testing

Live testing can be defined as the inspection, testing and commissioning of equipment or machinery that cannot be isolated while performing the required work. Such activities include but are not limited to diagnostic activities, fault finding and repair, servicing live equipment, testing of isolations and testing of repairs.

The purpose of a Live Testing system is to ensure the protection of the individual/s conducting the activities because a positive isolation cannot be achieved whilst Live Testing is being conducted.

If Live Testing is to occur, signage is required to be placed around the machinery warning others not to come into the area, nor touch the controls. If practical, barricading should be placed around the plant or machinery.

Equipment should remain tagged Out of Service during testing.

All energy sources that can be individually isolated should be. Only those energy sources directly required to be live for the testing should be left un-isolated.

Workers shall be made aware of emergency stop buttons, location of controls and the level and type of communication required between workers during testing.

7. De-isolation and Personal Lock removal

De-isolation is the process of removing isolations and returning equipment to normal operation.

The generic process of de-isolation involves reversing the Identify, Isolate, Test and Lock process:

1. Verify that work has been completed,
2. All workers to remove their own locks from equipment,
3. Physically check all Personal Padlocks and tags have been removed,
4. Re-energise equipment.

Note: In the case of a person leaving site without removing their lock, the Registered Manager/Delegate must provide written authorisation after locating the person personally for the lock to be removed.

8. High Voltage

There are legislated requirements for High Voltage work. High Voltage work requires the following:

1. The manager of a project where high voltage equipment is installed must appoint a competent person/s as high voltage operators to be responsible for high voltage installations at the project. This is recorded in the Mine Record book.
2. Before any high voltage installation is installed at the project, complete details of the proposed installation are to be provided to an electrical inspector.
3. Isolation of any high voltage equipment at the project for is only carried out by the appointed person.

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4. Reviewing of the Electricity Regulations 1947 as needed, to ascertain the safe methods of work and equipment required to be complied with.
5. A person does not work, or operate any plant, in close proximity to exposed high voltage conductors or components unless authorised to do so by the High Voltage Access Permit. This is to be issued by the appointed high voltage operator, must not be issued unless the high voltage operator has ensured that all relevant safety measures have been detailed on the permit and are in place.

9. References

9.1 Reference Documents

Title	Document Number
National Work Health and Safety (National Uniform Legislation) Act and Regulations 2011	
Work Health and Safety Act 2020	
Work Health and Safety Regulations (Mines) 2022	
Commission for Occupational Health and Safety, <i>Guidance Note: Isolation of plant</i> , 2010.	
Department of Mines and Petroleum, <i>Code of Practice: Safeguarding of Machinery and Plant</i> , 2009.	
Safe Work Australia, Code of Practice: Managing Risks of Plant, www.safeworkaustralia.gov.au , 2013	

9.2 Key Terms and Definitions

Term	Meaning
De-Isolate	To restore energy to equipment/plant so as it can be operated, i.e. switch on, replace fuses, turn valve on, or remove Isolation Tags/Padlocks.
Energy	<p>Energy and Energy Sources are forces that power the capacity of a physical system to work.</p> <p>Energy sources are essentially as follows:</p> <p>Mechanical Energy, the energy of motion that does the work</p> <p>Heat Energy, where motion or rise in temperature is caused by heat</p> <p>Chemical Energy , is the chemical reaction causing changes</p>

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	<p>Electrical Energy is when motion, light or heat is produced by an electrical current</p> <p>Gravitational Energy where motion is caused by gravity's pull</p>
Energy Isolation	The process or activity of applying a barrier or control through the use of padlock, tag and de-energisation between an energy source and an activity or function that is being performed.
High Voltage	Any electrical current exceeding 1000 volts AC. High voltage power supplies can only be isolated by a High Voltage Authorised Person.
Isolation	To turn off and make safe an area or item of equipment, such as a conveyor or pump, and put a tag and/or padlock on the switch.
Isolation Device	Equipment used to ensure that isolations once made, cannot be inadvertently over-ridden, cancelled or interfered with.
Out of Service Tag	An out of service tag is a notice that distinguishes plant as out of operation. Whilst an Out of Service tag is attached, the equipment shall not be operated. An out of service tag does not protect a person, only the machine.
Personal Padlock	An isolation device utilised as a protection mechanism for a person, it prevents this equipment from being re-energised.
Plant	Any machinery, tools, appliances and equipment.
Scissor Hasp	A device used to allow multiple padlocks to be attached to an isolation point
Test (Try)	After plant or equipment has been shut down and tagged, all isolated power sources should be tested. First with appropriate instruments and then by trying to activate the plant, before any person attempts to start work on the plant. This should be done by persons familiar with the plant (or parts of the plant, including control stations and remote computers) to ensure isolation procedures have been effective