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**Kaius Resources**

**Standard Operating Procedure – Isolation and Tagging**

Reference: SOP-005

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# Purpose

This Standard Operating Procedure outlines the requirements for protecting personnel during maintenance activities, identifying equipment that is not fit for service and conveying information about a specific item of plant.

# Scope

This Standard Operating Procedure (SOP) applies to all activities at sites operated and/or under the control of Kaius Pty Ltd and its subsidiaries. It applies to all persons working on the site including exploration personnel, permanent, temporary and contract employees. This SOP forms a key part of the Kaius Safety & Health Management System which has been established to manage risk to an acceptable level and in accordance with all relevant legislation.

# Authority

This procedure can only be altered with the approval of the Site Senior Executive (SSE).

# Responsibilities

**Site Senior Executive (SSE)**

Site Senior Executive shall ensure:

* That all of the provisions of this SOP are implemented, and that compliance is achieved.
* Adequate resources are provided to maintain compliance with the requirements of this SOP.
* The application and requirements of this SOP are periodically audited and reviewed, and
* Authorise appropriate personnel for cutting and welding functions.

**Supervisors**

Supervisors shall ensure:

* That the requirements of this SOP are implemented.
* That workers, including contractors, are trained in the requirements of this SOP.
* All work undertaken within their area of responsibility is conducted in accordance with the requirements of this SOP.
* They monitor compliance with this SOP.
* This SOP is readily available to all mine workers, and
* That the relevant mine workers are competent in the use of the apparatus.

**Mine Workers**

Mine Workers shall:

* Comply with all requirements of this SOP.
* Not undertake any tasks for which they are unable to safely complete.
* Read and sign onto the Isolation Permit.
* Ensure your Personal Lock and Tag is fitted to the Isolation Point or Group Lock Box when working on isolated equipment.
* Remove lock and sign off documents when task complete.

**Permit Authoriser**

Permit Authoriser shall:

* Authorise valid isolation permits and checklists, including other supporting Permits.
* Ensure any simultaneous operations are identified and managed.
* Ensure all isolation equipment that has been issued and returned is accounted for.
* Report any breaches of isolation procedures.
* Ensure all documentation is completed correctly, readable and accurate.
* Close out, collect & file completed documents.

**Permit Holder**

Permit Holder shall:

* Ensure the Permit is understood and complied with at all times.
* Ensure all documentation relating to the isolation process is managed and safe from loss or damage.
* Ensure all personnel comply with permit requirements.
* Stop all works and remove all personnel if the permit requirements have been compromised.
* Sign over permit to another Permit Holder if work is still being undertaken.

**Authorised Isolator**

Authorised Isolator shall:

* Comply with the requirements of the Isolation Permit.
* Ensure all isolations are initiated and report any failed isolations to the Permit Authoriser immediately.

• Account for all isolation locks during installation and removal.

# Definitions and Abbreviations

The following definitions and abbreviations are used in this procedure.

|  |  |
| --- | --- |
| Authorised Isolator | A person formally authorised carry out isolations in conjunction with the Group Isolation Permit.  |
| Commissioning | The process of verifying the functions and specifications of a system, plant or equipment. This process does not only apply to new equipment and plant but also to plant and equipment subject to expansion or overhaul. |
| De-isolation | Carried out by an Authorised Isolator to return equipment or plant back to service by removing all isolations and re-energising the system. |
| Energised | Establishing a source of energy such as an electrical supply, hydraulic pump or motor and / or having any stored energy present. |
| Isolation | Isolation is the process by which a source of energy is removed or contained and remains in place for the duration of the work. |
| Isolation Device | Equipment that is used to assist in the isolation of plant and equipment and facilitate the fitment of a hasp for personnel to lockout on (e.g. plastic valve covers, chains or cables). |
| Isolation Point | A point or points used to remove/control the potential stored energy or source of energy from plant (e.g. switch, plug, de-contactor, valve, clamp, restraint or locking point). |
| Plant | Includes any machinery, equipment (mobile or fixed), appliance, apparatus, implement or tool and any component, fitting or accessory thereof, including all associated switches, valves, levers, controlling devices or isolators. |
| Service Lock | A maintenance lock used to lockout equipment that is out of service and must not be energised. |
| ‘Test for Dead’ | The checking of the control effectiveness of a potentially hazardous energy source for isolation purposes i.e. attempting to start up the machine post isolation. |
| Testing  | Work that includes the physical testing of energised electrical or mechanical systems, fault finding or any other ‘power on’ maintenance activity. |
| Testing and Adjusting Tag | Identification tag that when attached to plant indicates that equipment is live (i.e. has power either Mechanical or Electrical) to conduct tasks such as testing and adjusting. |
| KRES | Kaius Resources Mine |

# C:\Users\ollie.hastie\Documents\01. Permits System\01. Group Isolation Permit\Resources\12 step.jpgTwelve (12) Step Isolation

Kaius Resources Mine utilises the Twelve (12) Step Isolation Process for all where there is a risk of exposure to a release of potential energy. The purpose of this process is to protect people, the environment and plant.

**Step 1 - Identify energy sources**

* Identify all primary energy sources and confirm that the Isolation Point(s) (for example, switches, circuit breakers, de-contactors, whole current isolators, battery isolators, valves, etc.) are correct. Where appropriate refer to schematic diagrams to confirm that the Isolation Point(s) used deactivate all energy sources, i.e. provide complete isolation.
* Identify any associated plant or equipment that could create a hazard.
* Check for secondary sources of energy such as stored hydraulic pressure, air pressure and suspended loads must be considered (others include loader bucket in the air, conveyor counterweights, etc.).
* Determine the type of isolation that you will require (for example: Individual Isolation, Group Isolation, or High Voltage Isolation) and apply it as required.

**Step 2 - Advise relevant parties**

* Notify all the persons who will be affected by the isolation to confirm that no safety or operational problems will be created.
* Where necessary advise operators that the plant or equipment they are using is to be isolated and that the equipment and area shall be left in a safe condition prior to isolating.

**Step 3 - Isolate and secure energy sources**

* Deactivate any energy sources at their primary Isolation Point. For example: operate a whole current isolator, remove a plug, close a valve, etc. Shedding of loads prior to operating a primary isolator may need to be considered in some instances.
* Isolate, secure or control all secondary energy sources. For example:
	+ Bleed off stored hydraulic or pneumatic pressure from pressure vessels, accumulators, pipes, hoses, etc.
	+ Release stored energy such as springs and conveyor belt tension, etc
	+ Secure, barricade or chock elevated equipment or material hung-up in chutes, truck bodies, etc, and
	+ Chock machinery and equipment to prevent unplanned movement.

Do not use auxiliary devices such as: push buttons, control circuit devices, emergency stop buttons, key-switches and conveyor lanyards for isolation purpose.

**Step 4 - Apply Personal Danger Lock (Red) & Tag or Permit Locks (Yellow)**

* A Personal Danger Lock & Tag is to be placed on the appropriate Isolation Points by a competent person (use a scissor clip / hasp if multiple lock on required).
* Any Short Term Contractor required to place a Personal Danger Lock & Tag can only do so under the direct supervision of a competent person or Permit Holder.
* When a permit is being used:
	+ A Permit Lock & Tag is to be placed on the relevant Isolation Points via a scissor clip / hasp by the Authorised Isolator after the appropriate permit has been approved by the Permit Authoriser, and
	+ All members of the work party shall sign onto and attach their Personal Danger Lock & Tag to the appropriate Lock Box after checking the work they are performing under isolation is covered by the specific permit.

**Step 5 - Verify the effectiveness of the isolation**

* All isolations must be checked to verify their effectiveness. The following actions are to be carried out:
	+ Testing the test equipment is in serviceable condition and is set to the correct scale, for example, check pressure gauges, non-contact voltage detector multi-meters, and
	+ Checking the operation of test equipment before and after isolation.
* Test the isolation to ensure it is effective and reliable by:
	+ Checking for the presence of voltage in the case of electrical isolations. Attempt to switch the isolator to make sure that it is secured in the isolated position.
	+ Attempting to start the equipment, for example, attempt to start the mobile equipment or the machinery.
	+ Attempting to operate valves in pipelines. Closed valves must not allow liquid or air to pass. Open valves must drain without obstruction.
	+ Confirming secondary energies are secured, e.g., chocking, bleeding and barricading, etc.
* Any specific test methods relating to the types of equipment used will be determined and applied for the various isolations.

**Step 6 - Commence work**

* Commence the task(s) to be carried out under the isolation.
* Monitor the work area for any new or changing hazards.

**Step 7 - Complete work**

* Complete the task(s) to be carried out under the isolation.

**Step 8 - Check work**

* Review all work that has been carried out under the isolation, confirm the work-area has been left in a safe condition, for example, guards and covers are back in position, etc.
* Attach an Out of Service Tag (and service lock if required) to the plant or equipment Isolation Point if it is not safe or not serviceable.

**Step 9 - Clear area**

* Confirm all persons working on the isolated plant or equipment have completed their tasks and are clear of the work area.
* Confirm the area in which energy will be restored is been returned to a fit for purpose state. Remove any rubbish from rotating parts, roll up hoses, remove spare or replaced parts, remove waste, clean up any spillage, etc.

**Step 10 - Remove Personal Danger Lock and Tag or Permit Locks**

* Remove all Personal Danger Locks & Tags associated with the isolation. Each person is to remove only their own Personal Danger Lock & Tag.
* When permits are being used, each individual is to sign off all permits, and remove their Personal Danger Lock & Tag associated with the permit. The Permit Authoriser may then cancel the permit.
* Short Term Contractors may only remove their own Personal Danger Lock & Tag under the direct supervision of a competent person or Permit Holder.

**Step 11 - Restore energy**

* Advise all stakeholders of the restoration energy.
* Restore energy to the plant or equipment in accordance with the OEM or site procedures.

**Step 12 - Check operation**

* Test-run the plant or equipment to confirm that the work carried out has been successful and that the plant or equipment is operating normally.
* Attach an Out of Service Tag (and service lock if required) to the Isolation Point if it is not serviceable, or if testing is required prior to operation.
* Attach an Information Tag if required.

# Personal Isolation

1. This refers to a situation requiring isolation of energy where:
	* Six (6) or less persons are involved in the work to be carried out.
	* The work does not involve more than four simultaneous (4) isolation points.
2. A Personal Isolation can be performed by a person that is competent.
3. If more than one person is involved, ALL personnel performing the work MUST use their own Personal Isolation Lock (red) and tag. (First lock used will be attached via a hasp).
4. If a person is unsure of the location and requirements of an isolation, (such as a new starter or contractor) a competent person must assist.
5. Personnel such as a Short Term Contractor conducting an urgent critical task must have their isolations directly supervised by a competent person.
6. Personal Isolation Locks shall not be used for any other purpose.

**If you are not sure ASK!**

## Removal of Personal Isolation Lock and Tag

1. All personnel are required to remove their own Personal Isolation Lock and Tag at the end of the task or when leaving the area for more than one (1) hour. Where a Personal Isolation has been removed and the task is not complete an Out of Service Tag (and service lock if required) must be placed on the isolation point of the equipment.
2. Where a person has not removed their Isolation Lock at the end of task or shift, the following process shall be followed.
	* Issue and complete FRM-135 Personal Isolation Lock Removal Form to remove an Isolation Lock or to sign off of a Group Isolation Permit.
	* If the person can be located, they are to return to remove their Isolation Lock or sign off, immediately.
	* If the personal cannot remove their own lock then, a “Personal Isolation Lock Removal Form” is to be used to authorise the lock removal or counter signature.
	* The Supervisor is to initiate an incident report as soon as practicable after the lock has been removed.

# Group Isolation

1. Group Isolations Permit shall be undertaken where:
	* the number of persons exceeds six (6) or
	* where the number of Isolation Points exceeds four (4) or,
	* when a group isolation is a preferred option over personal isolation.
2. Persons completing the Group Isolation will follow the 12 Step Isolation Process and will use the following locks and tags:
	* Permit Holder Lock (Blue) to indicate a Permit Holder has secured the keys to the Permit Locks in the relevant Group Lock Box, and
	* Permit Lock (Yellow) and group isolation tags to indicate a permit is being used.

## Group Isolation Permit

1. Where a Group Isolation Permit is required the Permit Applicant must:
	* Complete a Authority to Work Permit as well as a Group Isolation Permit.
	* Collect any supporting documentation, such as any other supporting permits for the task, drawings or plans.
	* Submit completed application and supporting documentation to the Permit Authoriser for approval.
	* Provide enough time for the Authoriser to review and approve the Permits before work commences.
2. The Permit Authoriser upon receiving the completed Permits and documentation, must:
	* Review the documentation to ensure it is valid, complete and appropriate for the task.
	* Liaise with the Authorised Isolator to conduct the Group Isolations.
	* Ensure any simultaneous operations are identified and communicated to the relevant persons.
	* Register the Permit in the site Permit Register.
	* Prepare the approved documents in a weatherproof document holder for issue.

## Group Isolation Process

Once the Permit has been registered the following actions must be completed:

* The Authorised Isolator collects and inspects isolation equipment and independently completes the isolations as per the Permit.
* The Authorised Isolator returns the Group Lock Box with the keys and any remaining Permit Locks along with the signed Permit documentation to the Permit Authoriser. (all sections of the permit must be completed)
* The Permit Holder / Users may request to inspect the isolations prior to taking responsibility for the Permit.
* The Permit Authoriser is to communicate any special conditions to the Permit Holder including any potential simultaneous operations that may impact the work.
* The Permit Authoriser hands over the Group Lock Box and all relevant Permits / documentation to the Permit Holder in a weatherproof document holder.
* The Permit Holder shall place the Permit Holder’s Lock onto the Lock Box and maintain responsibility for the key, unless signed over to another Permit Holder on the Permit
* The Group Lock Box Is to be taken as close as practicable to the work site to enable easy access for Workers to sign ON or OFF and place their Personal Danger Locks and Tags as required.
* All Permit Users shall place their Personal Isolation Locks and Personal Danger Tags onto the Group Lock Box as well as sign onto the Group isolation Permit.

## Continuation of Isolation Permit

1. Where a task requires the isolation to continue beyond a single shift the following actions must be undertaken:
	* The Permit Users shall remove their locks and tags at the end of shift.
	* The Permit Holder shall ensure the work area is left in a safe condition.
	* The Permit Holder shall maintain security of the Permits / documents and Group Lock Box and Permit Holder’s key, unless signed over to another Permit Holder.
	* Permit Users shall re-attach their locks and tags at the start of shift.
2. The Permit Holder shall undertake an inspection of the work area verifying the isolations are intact and safe to commence work before anyone starts work.
3. Where there is an issue with the work or the ability to comply with the requirements of the Permit, work shall cease and be reported to the Permit Authoriser immediately.
4. If a change to an isolation in a group lockout is required, the following must occur.
	* an information tag with a detailed description of the change must be attached to the Group Lock Box,
	* the Group Isolation Permit modified to show the change,
	* the Permit Holder is to be informed of the change.
5. The Group Isolation Permit can remain in force for a period of up to 4 weeks, however the Permit Authoriser must revalidate the permit every week. This includes identifying any potential risks to users and planned works which may impact current activities. Section 2 of the permit must be signed by the Permit Authoriser to be considered as valid.

## De-isolation and Return to Service

1. Once the work has been completed and the plant / equipment can be de-isolated and returned to service, the following actions must be completed:
	* The Permit Users shall remove their locks and tags.
	* The Permit Holder shall ensure the work area and equipment is left in a safe condition.
	* The Permit Holder shall return the Permits and Group Lock Box to the Permit Authoriser and sign off on the Group Isolation Permit and Work Authorisation Permit.
	* The Permit Holder shall remove the Permit Holder’s Lock.
	* The Permit Authoriser shall confirm that all works have been completed and the work area and equipment is in a safe condition to start or handover.
	* The Permit Authoriser will organise for the removal of the Group Permit Locks by an Authorised Isolator and close out all original documentation.

# Isolation Training

All personnel operating or maintaining any fixed or mobile plant or acting as a Permit User shall complete training as part of their site induction prior to undertaking any work, which covers Isolation and Tagging SOP-007.

Personnel undertaking any role in Group Isolation other than Permit User shall complete the following:

* Permit System, Permit Authoriser, Permit Holder
* Permit System, Authorised Isolator Authorisation, Authorised Isolator

# Testing and Commissioning

Testing and commissioning can occur on any mobile or fixed plant and within simple or complex operational systems for the purpose of repair or verification. These processes generally occur with equipment or systems that are completely operational / live or partially isolated, depending on requirements.

## Setup of Work Area

Prior to conducting any live testing of HME systems the mine worker must ensure:

* Plant is fundamentally stable and GET is grounded as required
* Area immediately around the machine being tested is clearly barricaded with either traffic cones, bollards or fencing and “Testing In Progress” signage is in place
* Testing outside of a workshop requires a minimum of one person to have on their person a handheld two-way radio in case of emergency

## Testing and Commissioning of Plant

Prior to undertaking testing and commissioning of mobile or fixed plant, the Live Testing Checklist FRM-322 must be completed by the worker.

1. The checklist shall consider, as a minimum:
	* Potential hazards to workers and others arising from testing and commissioning work.
	* Barricading, signage and tagging requirements.
	* Use of spotters
	* Partial isolation of non-testing / commissioning systems.
	* Emergency planning and response.
	* Permits, procedures and OEM manuals.
	* Communications between personnel doing the work, especially in noisy environments.
	* Chocking and securing mobile plant from unwanted / hazardous movement.
2. Conducting live testing of machine systems, operations and functions requires the following controls:
	* A testing and adjusting tag must be placed on the main access point and main control panel of the equipment that is being tested
	* Keep clear of machine crush zones at all times
	* Ensure machine guarding and lagging is fitted at all times
	* Utilise hydraulic lockout of machine functions where possible, bleed the systems of residual stored energies prior to testing
	* No person is to enter an area where plant or equipment is under testing or commissioning without permission of the Mine Worker undertaking the testing

**The main issues with testing and commissioning of plant is the potential for the person/people conducting the testing being injured and other personnel entering the work area without workers being aware, controlling these hazards is critical to conducting the work.**

# Tagging

Kaius Resources Mine utilises four specific types of tags for work onsite, each tag serves a different purpose and are not interchangeable. You cannot use a different tag than the one that is required.

## Personal and Group Isolation Tags

1. Personal tags are used to identify the person placing the lock. The tag can be either printed card or disposable. Whenever a personal danger tag is fitted it must be securely attached via an eyelet in the tag to the lock on the Isolation Point.
2. A printed card tag must contain at least the following information:
	* Your name, and
	* Department

Note: It shall not have any company name or logo other than Kaius Resources

1. A disposable Isolation tag shall have the following details completed in pen:
	* Full Name of the person placing the tag.
	* Signature of the person placing the tag.
	* Relevant department responsible for the work.
	* Date and time the tag was fitted.
	* Reason for isolating the equipment.
2. The tag must be checked regularly and maintained throughout the time the isolation locks are fitted to the Isolation Point.
3. Disposable or paper Isolation Tags are not transferable and must be destroyed after the task is complete.
4. Group Isolation Tags are fitted to the Group Isolation Locks, these tags are subject to the conditions of the Group Isolation Permit.

## Testing & Commissioning

1. A Live Testing Tag is used to inform personnel that equipment may be fully energised or partially isolated and personnel may be carrying out testing or commissioning activities on that equipment. The plant or equipment undergoing testing or commissioning shall be barricaded and the testing & commissioning tags fitted at the main access point and main control panel.
2. No person is to enter an area where plant or equipment is under testing or commissioning without permission of the Mine Worker undertaking the testing.

## Caution / Out of Service Tag

1. A Caution / Out of Service Tag is used to protect personnel and equipment from using unserviceable equipment. A Caution / Out of service tag can be fitted by any person, it must be placed in a prominent position where it can be easily seen by anyone who may operate or access the plant or equipment.
2. A Caution / Out of Service Tag shall have the following details completed in pen:
	* Classification
	* Department
	* Date and time the tag is fitted
	* The reason for placing the tag, ensure that there is adequate detail so that all readers will understand what the hazard is and why the tag has been placed
	* Name of the person fitting the tag
3. Caution / Out of Service Tags can only be removed by a competent person who is undertaking or has completed repairs and is returning the equipment back to service.

## Information Tag

1. Information tags shall only be used to convey general information about plant and equipment. It shall not be used as a substitute for an Isolation Tag, or a Caution / Out of Service Tag. An Information Tag can be attached to any piece of equipment to allow the transfer of information.
2. Common uses for information tags include:
	* Attach to taped / barricaded areas to explain the reason for the barricading.
	* Transfer maintenance requirements to operators, (i.e. wheel re-torque after 10 hrs)
	* Identify equipment items for which a maintenance notification has been raised (i.e. a leaking valve).

# Review Criteria

This document shall be reviewed:

* Every three years
* When there is a change of method and/or technology that may affect the accuracy of this document, and
* When a significant incident has occurred that is relevant to this document and its subject matter.

# Safety and Environment

Safety and Environment are covered in the body of this procedure.

# Attachments, References and Related Documents

## Attachments

## References and Related Documents

Mining and Quarrying Safety and Health Act 1999

Mining and Quarrying Safety and Health Regulation 2017

DNRM Hazard Database