HRP22: Lock Out, Tag Out

(1) Purpose and Scope

(2) The purpose of this procedure is to ensure the management of risks associated with energy isolation at Southern Cross University (SCU) are appropriately managed and controlled.

(3) The purpose of this procedure is to ensure Southern Cross University's management, employees, contractors, students, visitors and others are aware of the risks associated with energy isolation in the workplace, management strategies and to provide advice on appropriate controls.

(4) All employees, students and others including both independent contractors and contractors under SCU control are to be made aware of and follow this procedure.

(5) This Procedure applies to all SCU Work Units and sites. The procedure aligns with WHS legislation in the relevant jurisdictions SCU operates.

Section 1 - Definitions

Competent Person	A person who has acquired through training, qualification or experience the knowledge and skills to carry out the task. A competent person has a more specific meaning in the following circumstances: For design verification, the person must have the skills, qualifications, competence, and experience to design the plant or verify the design. For inspecting plant for registration purposes, the person must have: • educational or vocational qualifications in an engineering discipline relevant to the plant being inspected, or • knowledge of the technical standards relevant to the plant being inspected. For inspecting mobile cranes, tower cranes, amusement park devices and passenger ropeways the person must have the skills, qualifications, competence, and experience to inspect the plant, and be registered under a law that provides for the registration of professional engineers in jurisdictions where such a law exists or be determined by the regulator to be a competent person.
Danger tags	Danger tags are prominently marked 'Danger - Do Not Operate'. Danger tags are to be placed only for the protection of personnel working on plant. They are not to be left on after that person completes their work or finishes their shift. Danger tags should: • Be durable and securely fixed to the point of isolation • Clearly state the warning, including any warning about the specific hazards relating to the isolation • Be dated and signed by the worker/s involved in carrying out the work or, where appropriate, by the supervisor in charge of the workers; and • Be attached in a prominent position on each isolation point (or one of many points used to isolate) the plant or equipment. When the work is completed, the tags may only be removed by the signatories to the tag. If unavailable and unable to return, measures must be put in place to manage the risk associated with removing the tag.
Hazard	A situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence at the workplace.
Health and safety representative	An employee who has been elected by their work group under the WHS Act to represent them on health and safety matters.

Isolation	Isolation involves disconnecting the equipment from all possible sources of supply to prevent the equipment becoming live or operational.
Isolation device	A lock out device that removes plant or equipment from its energy source and prevents inadvertent operation, for example: • Manually operated circuit breaker. • Disconnect switch. • Manually operated isolating switch by which the conductors of a circuit can be disconnected. • Line valve. • Wheel chock or roll prevention device.
Lock out	An energy isolator such as an electrical power switch being turned to the OFF position and secured in the OFF position by having a physical block fitted such as a padlock with key removed. This lock out stops the plant or equipment from being turned on accidentally or in an unplanned circumstance.
Person conducting a business or undertaking (PCBU)	A PCBU is an umbrella concept which intends to capture all types of working arrangements or relationships. A PCBU includes a: • company • unincorporated body or association, and • sole trader or self-employed person. Individuals who are in a partnership that is conducting a business will individually and collectively be a PCBU. A volunteer association (defined under the WHS Act) or elected members of a local authority will not be a PCBU.
Plant	Plant includes machinery, equipment, appliance, container, implement and tool components or anything fitted or connected to those things. Plant includes items as diverse as lifts, cranes, computers, machinery, conveyors, forklifts, vehicles, power tools, quad bikes, mobile plant, and amusement devices. Plant that relies exclusively on manual power for its operation and is designed to be primarily supported by hand, for example a screwdriver, is not covered by the WHS Regulations. The general duty of care under the WHS Act applies to this type of plant. Certain kinds of plant, for example forklifts, cranes, and some pressure equipment, require a licence from the regulator to operate and some high-risk plant must also be registered with the regulator.
Person with management or control of a workplace	A person conducting a business or undertaking to the extent that the business or undertaking involves the management or control, in whole or in part, of the workplace. A person with management or control of a workplace does not include: • The occupier of a residence, unless the residence is occupied for the purposes of, or as part of, the conduct of a business or undertaking, or a prescribed person.
Reasonably Practical	Reasonably practicable means that which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including: • The likelihood of the hazard or the risk concerned occurring. • The degree of harm that might result from the hazard or the risk. • What the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk. • The availability and suitability of ways to eliminate or minimise the risk, and 1. after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Residual energy	Energy that remains in the plant or equipment following isolation, for example, mechanical parts that continue to move, capacitors, accumulators, fluids/gases under pressure.
Risk	The possibility harm (death, injury or illness) might occur when exposed to a hazard.
Tagout	A communication tool that advises workers that the plant or equipment is being tested, repaired, maintained, or otherwise out of service and must not be used.

Types of energy sources	• Gravity • Motion • Mechanical • Electrical (including magnetic energy sources) • Pressure • Sound • Radiation • Biological • Chemical such as gases, fuels • Temperature/Heat • Energy storing devices, such as batteries, springs
Workgroup	A group of employees is established to facilitate the representation of employees by one or more health and safety representatives. A work group may be all employees at a workplace, but it may also be appropriate to split a workplace into multiple work groups where employees share similar work conditions or are exposed to similar risks and hazards. For example, all employees on night shift.
Workplace	Any place where work is carried out for a business or undertaking and includes any place where an employee goes, or is likely to be, while at work. This may include offices, factories, shops, construction sites, vehicles, ships, aircraft or other mobile structures on land or water.
Zero energy state	When the plant or equipment has been isolated and any residual energy either dissipated, eliminated, or controlled, with a minimal acceptable risk posed to workers.

Section 2 - General Principles

(6) SCU minimises the risks arising from the energy sources to employees, contractors, students, and visitors to workplaces by:

a. Having this procedure accessible to the relevant people in the workplace.
b. Providing information, instruction and training to employees involved with the assets, equipment, plant and its components.
c. Ensuring a Permit Authoriser and Permit Holder are aware of their roles and responsibilities so that the work group follows and implements the isolation procedures and process.

Consultation

(7) SCU will ensure that consultation occurs with employees, contractors and managers, adopting the risk management process, with anyone who may be affected by energy sources and when developing a safe system of work. SCU should consult with employees and contractors who modify, clean, maintain, repair, or inspect the energised plant or equipment when creating safe work instructions.

Information, Instruction and Training

(8) SCU must, so far as is reasonably practicable, ensure the provision of training, instructions, or supervision necessary to protect all persons from risks arising from work carried out as part of the conduct of SCU business.

(9) SCU will ensure that the information, training, or instruction is suitable and adequate to address the nature of the work and the degree of risk, confirming employee understanding and application of controls.

(10) The training content and format will be tailored according to the level of risk involved. This should include information on the types of hazards and risks the plant may pose to the person when they are conducting these activities. This information should be supported with safe work instructions.

Requirement for Isolation

(11) Ordinarily in routine operation scenarios, workers will be adequately protected from hazardous energies through the use of guarding, shrouds, physical separation, complete containment of energies within plant/equipment, or other applicable controls such as administration and personal protective equipment.

(12) Before any plant or equipment is inspected, maintained, cleaned or repaired, it must be deactivated and all sources of energy depleted (where possible), and locked and tagged as part of this isolation procedure.

(13) Isolation procedures apply when interlocks, guarding, or any other safety/protective device are removed, inactive, or by-passed with the intention of performing work tasks on the applicable plant or equipment. The isolation process ensures the safety of people doing the work on plant and equipment.

(14) The most common situations for using isolation are when:

a. Carrying out maintenance of plant or equipment.
b. Removing, cleaning or repairing equipment.
c. Modifying equipment.
d. Breaking into pipes or lines.
e. Carrying out electrical wiring.
f. Fault and / or problem finding.
g. Equipment is found to be faulty.
h. Working on or near equipment with energy sources, i.e. work on potentially moving parts.
i. Any other task that may involve exposure of employees or contractors to any hazards or stored energy.

Risk management

(15) Lockout and/or tagout of assets, equipment, plant and its components for routine inspections, repairs, maintenance, assessments, adjustments or cleaning should not be undertaken until a risk assessment is completed by the work unit team.

(16) A documented risk assessment must be completed to determine:

a. What energy sources are present?
b. What risks are associated with known hazards or energy sources?
c. What controls are implemented to remove all harmful sources of energy to make it safe?
d. Identify the isolation points required for the task/job to be undertaken safety.
e. Identify de-energisation processes.
f. Identifying Energy Sources
g. Possible energy sources that should be identified as part of a thorough risk assessment process include the following:
h. Electricity (mains)
i. Battery or capacitor banks
j. Solar panels
k. Fuels
l. Heat
m. Steam
n. Fluids or gases under pressure (e.g., water, air, steam or hydraulic oil).
o. Stored energy (e.g., compressed springs).

p. Gravity
q. Radiation.
r. Controlled or temporary magnetic fields (e.g., electromagnets).

(17) Isolation of potentially damaging stored energies can be carried out in a variety of ways. This information is typically found by reviewing the original equipment manufacturer's operation and maintenance manuals, reviewing 'as built' drawing/schematics, reviewing the individual plant & equipment risk assessment or physically inspecting equipment/infrastructure prior to performing a task, as part of the risk assessment process.

(18) When the risk assessment identifies energy sources, the Hierarchy of Control must be used in conjunction with the Property Services Lock Out and Tag Out Procedure and Safe Work Instructions 'Working on Electrical Equipment/Services' to ensure the task/job can be undertaken safely.

De-energise Stored Energies

(19) When plant or equipment are deactivated (e.g., disconnected from electrical supply), this does not necessarily guarantee that all stored or residual energies have been eliminated. Additional steps may need to be taken to dissipate, release, or neutralise forms of stored energy (e.g., hydraulic or pneumatic pressure, suspended loads, springs under tension).

(20) To ensure a thorough process is undertaken to appropriately de-energise stored energies, the following steps will be performed:

a. Ensure that all moving parts are stationary.
b. Install ground wires.
c. Relieve pressure.
d. Release spring tension, or prevent spring-driven parts from moving (e.g., use of a blocking device).
e. Prevent the fall of parts due to gravity (e.g., block or brace).
f. Block or otherwise safely move hydraulically- or pneumatically-powered parts to a low potential state (e.g., lower raised parts)
g. Bleed all fluid/pressure lines and leave appropriate venting valves open to release trapped or pressurised substances.
h. Drain piping systems and close appropriate valves to prevent hazardous materials from leaking or spilling.
i. Use a blank flange to block where there is no valve installed.
j. Purge reactor tanks and process lines.
k. Eliminate extreme cold or heat (or provide appropriate protective clothing to reduce the risk of temperature exchange and exposure).
l. Monitor stored energy systems/vessels to ensure they do not reaccumulate to hazardous levels.

Advise Relevant Workers

(21) Once the energies have been identified and controlled through isolation, other workers in the vicinity or who usually engage or operate the isolated plant or equipment will be notified of the energy sources and applicable controls. This process ensures there is proactive and positive communication about risk in relation to isolation procedures and relevant works being undertaken.

Hazard Warnings

(22) Areas where isolated works are being performed may require physical barriers such as bollards, temporary fencing, and/or warning and hazard tape.

(23) Where fault finding is being performed warning signs must be displayed in addition to the physical barriers to exclude access. Note fault finding should first be attempted in a de-energised environment using de-energised testing methods.

(24) The appropriate warning signage, tapes, and barriers should be used for the task.

a. Danger – do not enter signage and tapes must only be used to exclude persons from the area where live testing is being undertaken. No one will enter a danger area unless given permission by the Responsible Person and/or Supervisor or Manager in the work area.
b. Caution or warning signage and tapes must be used to notify persons of potential hazards in active work areas, such as objects and equipment on the ground (slip/trip risk). Such warnings must be accompanied by a tag that describes the nature of the hazard(s) and who placed the tape to enable consultation and information sharing as required.

Isolation, Locking Off, and Prevention Access to Electrical Equipment and Circuits

(25) To ensure electrical equipment or circuits remain de-energised while working, the electrical equipment or circuits should be effectively isolated from all relevant sources of electricity supply. This may be done using opening switches, removing fuses or links, opening circuit breakers or removing circuit connections.

No Working on or Testing Under Live Conditions

(26) SCU does not permit working on energised electrical equipment under any circumstances.

Plant Isolation

(27) A series of actions to be taken to prevent a plant or any of its parts from being moved or from releasing any stored energy such as heat, steam, electricity, or fluids is known as an isolation procedure.

(28) SCU must ensure that any operator controls are able to be locked into the “off” position to enable the disconnection of all motive power. Where this isn’t possible the process for de-energising must be documented, implemented and communicated to workers. SCU should assign competent individuals to create safe work instructions if their workplace lacks the necessary knowledge.

(29) Plant energy sources will be isolated in the following work situations:

a. Making changes to plant, such as modifications or upgrades.
b. Performing visual or invasive inspections of plant components.
c. Maintenance, cleaning, and repair of plant.
d. Storing plant.
e. Decommissioning, dismantling, and disposing of plant.

Lock out Tag out (LOTO) procedure

(30) Following the applicable codes of practice of managing plant risks, the steps involved in an isolation or LOTO process are as follows:

a. Shut down the machinery and equipment.
b. Identify all energy sources and other hazards.
c. Identify all isolation points.
d. Isolate all energy sources.
e. Control or de-energise all stored energy.

f. Lock out all isolation points.
g. Tag machinery controls, energy sources and other hazards.
h. Test by 'trying' to reactivate the plant without exposing the tester or others to risk (which effectively proves or disproves a 'zero energy state').

Key Restrictions

(31) The following key restrictions apply to all work processes involving LOTO:

a. No equipment is to be used or operated while an out of service tag is attached.
b. When plant or equipment has been shut down for servicing, repairs or maintenance no one is to commence work until they have attached a personal danger tag and lock.
c. No person can remove a personal danger tag placed by another person. The only circumstance under which a personal danger tag can be removed, is by the person who placed it on the equipment, or by the supervisor if the person is unavailable and they are satisfied that no harm can be caused.
d. Do not rely on a danger tag placed by another person. Always check, test and ensure that equipment is deenergised and isolated before commencing work.

Provision and Use of LOTO Equipment

(32) Individuals who are competent with the isolation procedure, must be provided with all locks, lock-out devices and tags. Isolation locks should only be used to isolate hazardous energy sources. They should not be used for other general purposes. When isolating an energy source for group isolation, a device that allows one or more padlocks to be fitted should be used. If more than one person is working on the same plant, each person should attach their personal lock to prevent the isolator being opened before all locks have been removed or opened. The isolation should identify common lock-out points to ensure hazardous energy sources cannot be restored while someone is still working on the plant. Isolation locks should only be able to be opened by authorised person with permit-to-work to remove locks and danger tags from isolation points.

Tags

(33) A tag is not an isolation device. It only provides information. It should never be used as an isolation device in SCU operations.

(34) The following types of tags are commonly used when a piece of plant is isolated from other parts of plant which include:

a. Personal danger tags.
b. Isolation tags.
c. Out-of-service tags.
d. Commissioning or testing tagging.

(35) Each worker involved in the maintenance, cleaning or repair of the plant should have a lock, tag and key for each isolation point. There should be no duplicate key for any lock, except a master key that is kept in a secure location and should only be used in an emergency.

Placement of Danger Tags and Locks

(36) The personal danger tag must be filled out with your name, work unit, date, time, reason for isolating and your signature.

(37) Each person working on the equipment must place their own personal danger tag, and if possible, a lock to the

isolating control. This process ensures that each person working on the equipment is protected and that the equipment cannot be inadvertently operated.

(38) These personal danger tags and locks are to always remain in place while performing work on the equipment.

Removal of Danger Tags and Locks

(39) When you have completed your work remove your personal danger tag and lock. Do not remove another person's personal danger tag or lock they may only be removed by the person whose signature appears on the tag.

(40) Once all personal danger tags have been removed notify all relevant personnel that the equipment will be energised. Do not operate equipment until each person has removed their personal danger tag.

(41) If the equipment is still not ready for use, an “Out of Service” tag must be attached to the equipment and your supervisor notified.

Verification of Isolation

(42) Before any work is performed on isolated plant or equipment, it must be tested by a competent person. The testing process effectively proves or disproves that the energy source has been effectively isolated and de-energised (a ‘zero energy state’).

(43) The testing process must ensure that each exposed part is treated as energised until such a time that it has been reliably determined to be de-energised. Always prove the presence and effectiveness of isolations before commencing work.

(44) If any worker is uncertain about whether an isolation has been successfully achieved and the plant or equipment are in a zero energy state, seek assistance from a suitably qualified and competent person (e.g., supervisor).

(45) At least one, or both of the following actions, if reasonably practicable, will be undertaken to verify the zero energy state:

a. Try to start and operate the plant or equipment using the controls. If relevant, reset the plant or equipment to its original state prior to commencing each test.
b. Test the plant or equipment using the appropriate testing procedure or inspection process.

(46) When working with electrical energy, always test before you touch and ensure that all isolation and subsequent electrical work is carried out by a suitably qualified person.

(47) The following methods can be used to prove or disprove that electrical energy has been appropriately isolated:

a. Physically removing or disconnecting the electrical circuit.
b. Inspection and observation of a physical separation in the break contactors.
c. Meter testing for dead of the applicable circuit(s).
d. Continuity testing.
e. Attempting to activate the plant/equipment when in local or manual mode.
f. Labelling Faulty Equipment

(48) If equipment is faulty and not being serviced place an out of service tag on it and report to your supervisor. This equipment should not be used or operated while an out of service tag is attached.

Repairing Equipment

(49) Before you start work ensure that the supply is effectively isolated. To do this, consider:

(50) De-energising the parts from all sources of electrical and mechanical energy.

(51) Each energy source must be isolated and locked out at each isolation point along the energy source route where practical.

(52) Removing all hazards from other sources of energy (i.e. spring tension or hydraulic pressure).

(53) Testing the equipment to ensure it has been effectively isolated.

(54) Incidents Including Near Misses

(55) If at any point, a worker becomes aware of a failed isolation and the plant or equipment is still in an energised state, the following steps will be immediately undertaken:

a. Stop the task.
b. Clear the area of personnel.
c. Safely implement additional control measures to prevent access to the area and the plant and/or equipment that is suspected to be in an energised state.
d. Report the incident or near miss to the supervisor and submit a RiskWare report
e. Participate in the incident or near miss investigation process.

(56) Note that the WHS Acts include provisions for notifying the regulator of dangerous incidents. A ‘dangerous incident’ means an incident in relation to a workplace that exposes a worker or any other person to a serious risk to a person’s health or safety emanating from an immediate or imminent exposure to any of the following (of relevance to stored or active/live energies):

a. An uncontrolled escape of gas or steam.
b. An uncontrolled escape of a pressurised substance.
c. Electric shock.
d. The fall or release from height of plant, substance, or thing.
e. The collapse, overturning, failure or malfunction of, or damage to, any plant that is required to be authorised for use under a regulation.
f. De-isolate and Re-energise to a Safe Working State

(57) Once the work has been completed and prior to removing the final lock and tag from the isolated plant or equipment, workers must:

a. Ensure that the area is clear of tools, parts, and any other debris or objects that could be affected by the re-energised plant or equipment.
b. Reinstall, secure, and inspect all relevant guarding, shrouds, or other physical separation measures.
c. Advise all workers in the area (and other persons as needed, such as vistors) to safely vacate the immediate are due to re-energising of the plant or equipment.
d. Remove all personal locks and tags only.
e. Re-energise the plant or equipment and restore it to its normal operating condition.
f. Advise all workers and other persons that the plant or equipment is back in operational service.

Section 3 - Roles and Responsibilities

(58) Refer to WHSMP13: WHS Responsibility and Accountability Statement.

Section 4 - Records of Documentation

(59) All relevant documentation will be recorded and kept in accordance with WHS Legislation and other legislative obligations including:

a. Hazard assessments
b. In-situ risk assessments
c. Service/Maintenance records plant/equipment
d. SWMS/SWI
e. Isolation check list
f. Permit-to-work records
g. Workplace Inspections Checklists
h. Training evidence/licences
i. Competency assessments

Section 5 - Revision and approval history

(60) This procedure will be reviewed as per nominated review dates or because of other events, such as:

a. Internal and external audit outcomes.
b. Legislative changes.
c. Outcomes from management reviews.
d. Incidents.

Section 6 - References

Work Health and Safety Act 2011
Work Health and Safety Regulation 2011 (QLD) 2017 (NSW)
Plant, Equipment and Machinery Energy Isolation Guidelines (NSW)
Managing Electrical Risks in the Workplace 2021 (QLD) 2019 (NSW)
Managing Electrical Risks in the Workplace Code of Practice 2021 (QLD) 2019 (NSW)

Section 7 - Related Documents

WHSMP13: Responsibility and Accountability Statement.
WHSMP05: First Aid, Emergency preparedness and Response Procedure.

Status and Details

Status	Current
Effective Date	9th December 2024
Review Date	9th December 2027
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Responsible Executive	Kim Franks Vice President (People and Culture)
Head of Work Unit	Brendan Pearce Director, Workplace Relations
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