

Some basics about chemical safety

Solvents are commonly used as cleaning/degreasing, as thinners or as part of paints, varnishes and adhesives. Many solvents are effective, easy to use and readily available from chemical suppliers. Improving the safety of chemicals at work means starting with the information provided in Safety Data Sheets.

Solvents can enter the body via our lungs or our skin. If the chemical evaporates easily more vapours are available to be breathed in.

For example, it is estimated that for a volatile solvent, with a flash point below 21, during a day's work a worker could inhale 5.5 litres of vapour.

Compare this to the volume of vapour that can be inhaled over a day using:

- a high boiling hydrocarbon: 0.025 litres
- vegetable oil based cleaning agents: 0.007 litres.

Vegetable based cleaning agents or high boiling point solvents virtually eliminate the hazard of breathing in chemicals.

The hierarchy of control is in all hazardous substances regulations. Our job is to make sure the first three steps are used.

Hierarchy of Control - The best to the least effective method:

- 1. eliminate:** do the job without chemicals
- 2. substitute:** use less dangerous chemicals
- 3. engineering controls:** keep the chemicals away from the workers e.g. in closed systems, ventilate away the fumes; flame proof lighting
- 4. change to safer work practices :** use glove bags, use brushes not sprays, use chemicals in smaller quantities, keep the lids on, keep out flame sources
- 5. organise training:** train workers in the health hazards of the substances they are working with, train workers in safe work practices
- 6. use personal protective equipment:** use masks, gloves.



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'It's no accident' is the OHS newsletter of the AMWU.
Feedback and story ideas to amwu@amwu.asn.au

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IT'S NO ACCIDENT
AMWU H&S NEWS

Made in Australia by AMWU members

November 2011

The Saga continues: Model WHS Laws

As we go to press, Western Australia and Victoria have not introduced the new laws into their parliaments. The ACT, Northern Territory, Queensland, Commonwealth and New South Wales governments will have the new Work Health and Safety Act operational from January 2012. Tasmania and South Australia will be introducing the new laws but, as we go to press, these governments cannot guarantee that the date of introduction will be January 2012.

LOCK-OUT (Isolation) PROCEDURES

Lock-out/isolation procedures prevent the risk of machinery and equipment being inadvertently started during maintenance, breakdowns, cleaning etc. Typically, people are injured when plant operators are unaware that someone else is working on the machinery.

Essential features of any isolation procedure are:

- I. There must be no duplicate keys
- II. Every person must have an assigned padlock
- III. Roles and responsibilities must be defined
- IV. Tagging out is a warning identifying who to contact. It is not a lock or a form of isolation. Two types of tags are used – personal danger tags and out of service tags
- V. Each worker involved in the maintenance, cleaning or repair of the plant should have a lock, tag and key for each isolation point. A set of master keys should be kept in a secure location and should only be used in an emergency
- VI. During development of the procedure everyone must be consulted--- machine operators, maintenance, cleaners, supervisors, HSRs etc.
- VII. All personnel working on machinery must be part of the permit to work: key/lock numbers must be recorded on permit.

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BULLETIN

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ISOLATING PLANT

DEVELOP PROCEDURES

Employers must develop isolation procedures in consultation with their workers and have these recorded for each item of plant. Each procedure will involve the following steps:

1. IDENTIFY ALL ENERGY SOURCES

All energy sources and their controls must be identified and recorded. Energy sources including electricity, steam, pressurised fluids and circuits, eg air, water, hydraulic oil, stored energy (in batteries, capacitors, springs, flywheels etc), gravity, radiation.

2. IDENTIFY ALL ISOLATION POINTS

The procedure for shutting down the plant in the correct order should be determined and recorded.

The machinery should be designed with clearly marked identifiable isolation points. It should be clear what each point is isolating.

It is important to remember that:

- emergency stopping devices are not isolation points and **must** not be used for isolating machinery.
- electrical isolators may only isolate control circuits. This is not an adequate level of isolation.

STEPS TO ISOLATE PLANT

Each step should be completed before work begins.

Shut down

Shutting down machinery/plant may require single or multiple energy sources to be shut down, sometimes in a certain order.

Isolate all energy sources

There may be multiple control stations or independent electricity sources. Some machinery will require electrical circuits, connecting equipment and circuit protection devices to be de-energised. Ensure the operator and all associated workers are aware work is being conducted.

De-energise stored energy sources

Energy may still be stored, even after energy sources have been isolated. Stored energy includes static, kinetic (eg rotational motion) and potential (eg due to the plant's position).

Stored energy can be:

- released by earthing to the ground, allowing the machine to complete its motion (particularly after breakdown)
- contained by preventing movement through blocking, wedging or propping the part. Ensure blocks, wedges or props are designed for this task and can only be removed by a deliberate release action. Consider negative pressure used to activate some types of plant.

Lock-out isolation points

When locking out plant, employers must ensure:

- there is one lock fitted for each person performing maintenance or non-production tasks. If there is more than one isolation point, each person will require sufficient locks to lock-out each isolation point
- there is a lock for each worker attached to isolation points that need to be isolated by more than one worker. This should be identified in the isolation procedure
- locks are kept on until the work is finished or the work is passed on to another worker
- multiple locks at each point are avoided by using a lock box
- there is only one key for each lock, apart from a master key that should be given to a responsible person and stored in a secure location for emergencies only. If someone has multiple locks assigned to them, they can hold one key for all locks.

Lock-out isolation points — out of service locks

Make sure a supervisor or nominated person has been allocated with out of service locks and there is a system to fit locks to jobs that run over one shift or day.

Machinery/plant has been tagged with the appropriate tag.

Tagging is not an isolation procedure. It is a warning of who to contact.

Personal danger tags (red & white) warn that someone is working on the machinery. These tags should only be attached after the machinery has been locked out and must be in clearly visible areas.

Out of service tags (yellow & black) are used when machinery is out of operation. If these tags are placed on machinery with isolated energy sources, they should only be done when it is locked in the safe (off) position.

Confirm isolation

Confirm all isolation steps have been carried out effectively. Ensure that:

- no errors have been made (eg correct isolators have been selected)
- isolators are in safe positions
- all stored energy is dissipated or restrained
- locks are attached to each isolation point for each worker performing work
- confirm all steps have been undertaken.

Test for zero energy

Test that isolation of energy sources has been successful. Testing should be done using appropriate equipment and by someone who is suitably qualified and understands the machinery, energy sources, energy principles and isolation procedures.

Changing shifts or crews

If work is being taken over by the next shift or another crew, a handover must occur. This involves discussing the stage the work is at and changing over locks and personal danger tags.

Removing another worker's locks and tags

The only worker who should remove personal danger locks and tags is the person who put them in place.

If the worker can not remove the lock and tag

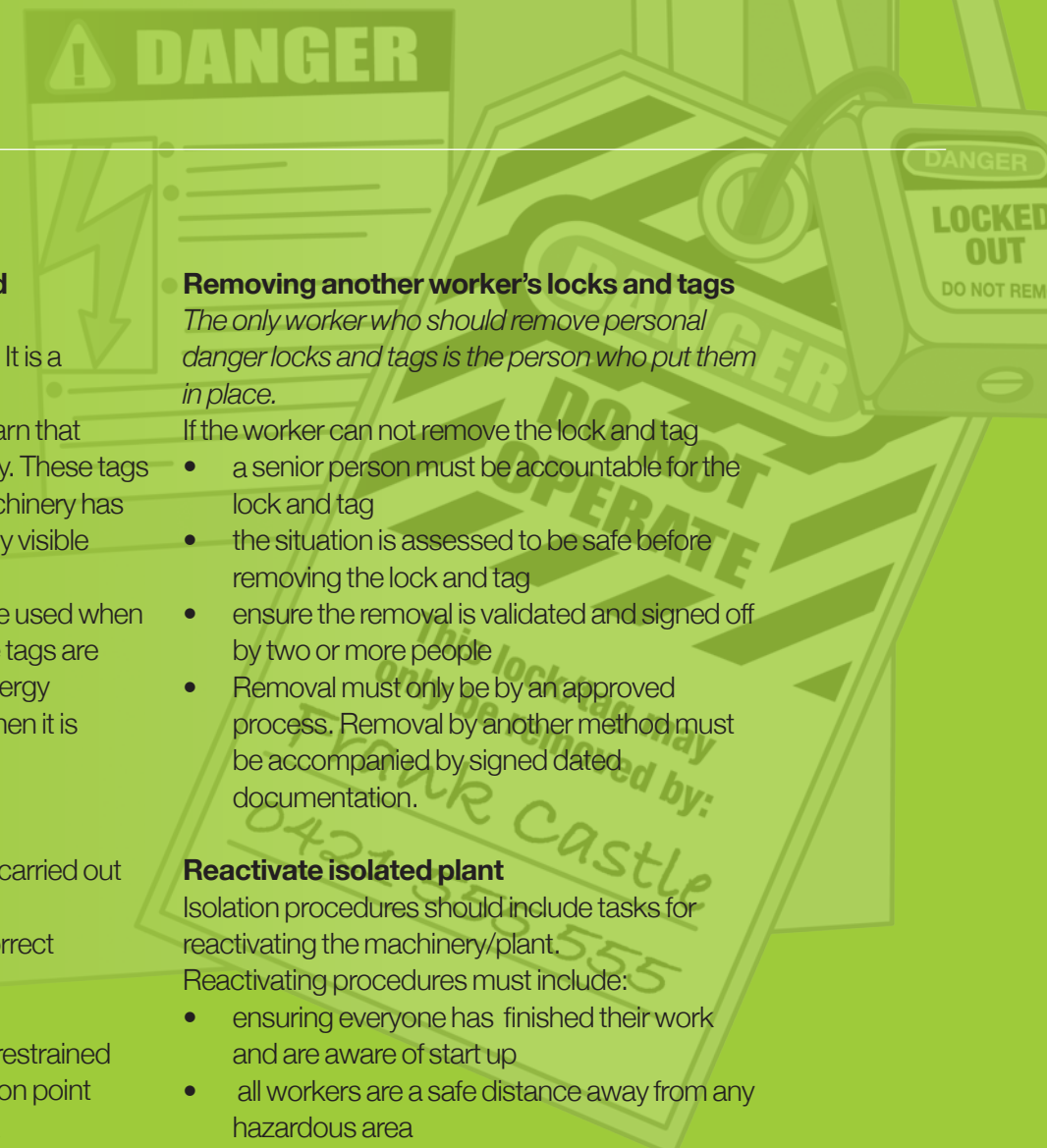
- a senior person must be accountable for the lock and tag
- the situation is assessed to be safe before removing the lock and tag
- ensure the removal is validated and signed off by two or more people
- Removal must only be by an approved process. Removal by another method must be accompanied by signed dated documentation.

Reactivate isolated plant

Isolation procedures should include tasks for reactivating the machinery/plant.

Reactivating procedures must include:

- ensuring everyone has finished their work and are aware of start up
- all workers are a safe distance away from any hazardous area
- blocks, wedges and props used to prevent parts from moving are safely removed (this will release energy)
- guarding is replaced
- locks and tags have been removed by the workers who placed them
- sensory guarding is reactivated and tested to ensure it is functional
- emergency devices are reactivated and tested (eg stop buttons and pedals)
- everyone understands the method and order energy will be restored to each isolated point.



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