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1.0 PURPOSE

This procedure describes the mandatory processes required for installing and removing Status Tags.

2.0 APPLICATION

The ZES (Zero Energy State) Program is applicable at all Vale Ontario operations.

Parameters for Electrical Locking & Tagging	
Up to 600 volts	• Employees must be trained and qualified to ZES003

Greater than 600 volts and up to 15kV	• Employees must be trained and qualified to ZES003
	• **Power Department** will follow **MPROC-55001 High Tension Lines, High Tension Switching Procedure** between 600 volts and up to 15kV
	• **All other departments** will follow **MPROC-50001 Electrical Department Switch Room and Substation Access Procedure**
	  ○ Employees must be trained and qualified electrical tradespersons or have been trained, qualified and permitted through MPROC-50001
	  ○ Requires communication with the plant's Electrical Department to establish the level of involvement required from them

Greater than 15 kV	• Requires Power Department

2.1. EXCEPTIONS

- High tension power lines and related equipment are under the direct control of the Power Department i.e. all 230kV, 69kV, and 44kV lines and equipment. All personnel must follow Power Department procedure MPROC-55001 High Tension Lines, High Tension Switching Procedure
- Overhead lines and related equipment below 15kV must follow plant specific policies and procedures
- Equipment greater than 15kV not owned by the Power Department e.g. Cottrell, must follow plant specific policies and procedures

3.0 REFERENCES

The following references were used in the development of this document or are related to it. Reference should always be made to the most current official version of these regulations.

- Occupational Health and Safety Act
  - Ontario Regulation 854, Sections 160, 185
  - Ontario Regulation 632/05, Confined Spaces Section 14
- CSA-Z460 Control of Hazardous Energy

4.0 DEFINITIONS

Authorized: a person who has been given permission to perform the task

Cascaded Lock Bock: a lock box that contains the keys from an identified red project lock that has been affixed to the exterior of another lock box or lock boxes

De-energized: disconnected from all energy sources and not containing residual or stored energy.

Do Not Operate Tag: a yellow reusable tag that indicates authorization from the System Operator must be obtain before removing tag or operating of the device (used by Electrical Tradespeople)

Delayed Starts: used to delay the operation of a process or start of a motor, pump, fan, etc. The time can be varied depending on the requirements and typically uses time delay relays to accomplish it.

Designated Tagger: a qualified worker or another person who installs and removes project personal protection and manages status tags

Device: a piece of equipment or a mechanism designed to serve a special purpose or perform a special function

Energy Source: any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravity, pressurized, flow of material or other stored energy.

Energy Isolating Device: a mechanical device that physically prevents the transmission or release of energy, such as a disconnect of switches, valves, spades, or blocks

Equipment: any machine driven by electricity or any other prime mover, and/or combination of machines that operates as a system / process, such as pumps, fans, electric motors, mobile machines, vessels, piping, valves, etc.

Frequency Drive: a type of motor controller used with AC motors to vary the frequency and voltage supplied to the motor (In doing so, it can vary the motor speed to match the load requirements of the motor such as controlling the speed of a conveyor belt, fan, mine hoist, etc.)

Grounding Device: an approved device to mechanically connect electrical conductors to ground

Ground Tag: a green tag identifying that a grounding device has been installed on the circuit

Hold Off Tag: Affixed to fused disconnects or breaker control handles by a linesman or P&C technician (tag issued by the Systems Operator) to prevent individuals from reclosing a tripped device

Interlocks: Used in electrical circuits, it is usually a device (common switch, infrared beams, photo detectors, etc.) used to prevent undesirable actions in a piece of equipment, machine or process.

Isolate: a process use or action taken to introduce any number of approved physical barriers between the equipment and sources or forms of energy and/or process material.
Isolation Equipment Operator: a qualified person who operates the Energy Isolation Device (i.e. controls, valves, etc.)
Isolation Equipment Operator: a qualified person who operates the energy isolation device.

Lock Box: a lockable device with provision to secure/see and count keys and hold forms that can be used in two applications: 1) By a Designated Tagger to secure keys and hold the lock box form 2) By a Local Tagger to secure the remote tagging form and hold the lock box form

Lock Extender: a red device used to allow multiple personal protection locks to be installed on an energy isolating device

Lockout Device: a mechanical means of locking an energy isolation device, using a Personal Protection Lock.

Local Tagger: a qualified person who uses a Remote Tagger to install the Local Tagger's personal protection locks and tags on energy isolating devices

Personal Protection Lock: an approved single keyed red lock capable of locking an energy isolating device or a lock box

Personal Protection Tag: an approved red tag that is used in conjunction with a personal protection lock to lock and tag an energy isolating device

Project Lock: an approved single keyed blue lock that is used by a Designated Tagger to secure keys in a lock box

Protected Worker: a Tagger who has installed personal protection and has verified a Zero Energy State

Qualified: a competent person designated by his/her employer as being qualified because of knowledge, training and experience to safely perform an assigned task.

Remote Tagger: a qualified person who operates, locks and tags energy isolation devices on behalf of a Local Tagger

Running Repairs: a repair to a piece of mobile equipment that is in an energized state (Two types of running repairs: 1. Running repairs with power ON + key ON / engine not running and the electric/hydraulic motor is not energized – personal protection tag required in operators control area 2. Running repairs with key ON / engine running or electric / hydraulic motor energized – personal protection tag and a qualified operator required in operator's control area)

Soft Starts: Used with AC motors to reduce the load and torque on the powertrain and current surge during start up. Allow the motor to slowly (softly) ramp up to full speed.

Status Tag: an approved white tag identifying why an energy isolating device may not be operated so as to protect equipment

Station Guarantee Tag: a white, reusable numbered tag used by Power Department to identify the fact that a certain device is being used to protect a person or group of persons while working on or near equipment

Superintendent: the level of management that supervisors who are in charge of equipment and/or processes report to.

Tagger: a qualified worker who installs and removes his/her personal protection and manages status tags.

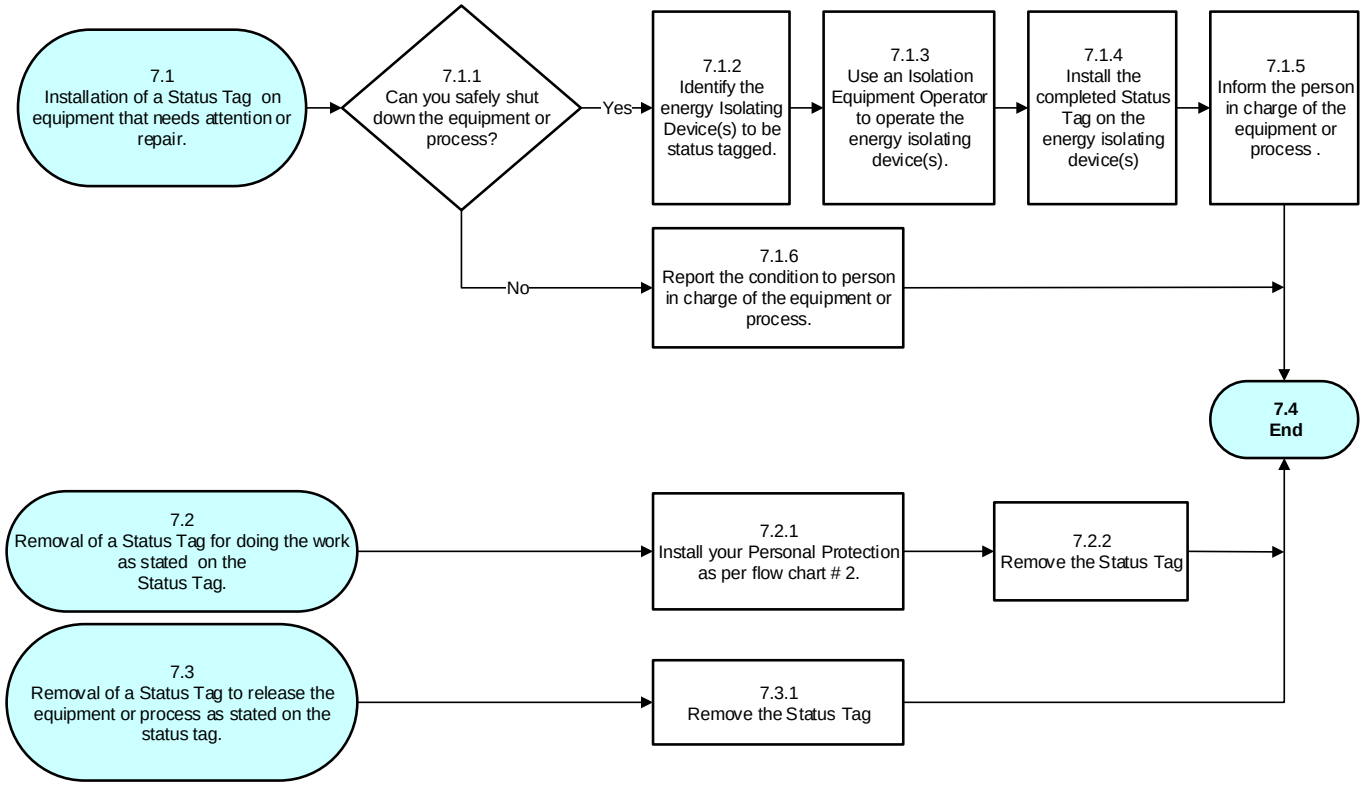
Variance: an approved plant specific measure put in place when it is impractical or unsafe to follow the Zero Energy State Locking and Tagging Procedure

Zero Energy State: a state where all hazardous energy has been isolated and de-energized, or otherwise controlled to manage risk.

5.0 STATUS TAGS – INSTALLING AND REMOVING

The following flowchart outlines the mandatory steps required for installing and removing status tags.

Status Tags, Installing and Removing
ZES Flowchart #7



The next sections describe the requirements for the three process flows shown in the above diagram:

- Installation of a Status Tag on equipment that needs attention or repair
- Removal of a Status Tag for doing the work as stated on the Status Tag
- Removal of a Status Tag to release the equipment or process as stated on the Status Tag

6.0 ZES PROCEDURE – FLOWCHART #7

FC: 7.1 INSTALLATION OF STATUS TAG ON EQUIPMENT THAT NEEDS ATTENTION OR REPAIR

The purpose of this process is to outline the steps taken when installing status tags to protect equipment and control hazards.

The steps are performed when a worker determines that the equipment must be secured in the isolated state to protect equipment and control hazards.

An example might be when a compressor has a faulty pressure relief valve, the equipment is capable of running, but obviously it is unsafe to allow it to operate.

FC: 7.1.1 CAN YOU SAFELY SHUT DOWN THE EQUIPMENT OR PROCESS?

The purpose of this step is to determine if you can safely shut down the equipment or process.

The Tagger has identified a piece of equipment or process that should not be allowed to operate. The Tagger must now make the decision if he or she has the authority to shut down and isolate the equipment or process. Some processes are complicated and must be shut down in a specific manner to avoid injury, process upset or equipment damage.

One example is when a worker discovers a leak on a compressor cooling water supply line; the person in charge of the equipment must be notified. The person in charge may need to take other measures prior to closing the supply line.

Another example is when you discover a sump pump with a broken discharge line. You would be able to safely shutdown the pump without affecting any other processes or equipment.

Each Tagger answers this question prior to shutting down the equipment or process that should not be allowed to operate: Can I safely shut down the equipment or process?

If the answer is “Yes”, then proceed to step 7.1.2

If the answer is “No”, then proceed to step 7.1.6

The question “Can I safely shut down the equipment or process?” must be considered before a Tagger shuts down the equipment or process.

FC: 7.1.2 IDENTIFY THE ENERGY ISOLATING DEVICE(S) TO BE STATUS TAGGED

The purpose of this step is to identify the energy isolating device(s) for the equipment or process you want to status tag.

The Tagger must identify the correct energy isolating device(s) to keep the equipment or process from operating. This step is performed every time a piece of equipment or process requires a Status Tag.

The Tagger is accountable for performing this task.

The Tagger will use any relevant resources to conduct this task:

- Equipment-specific hazardous energy control procedures.
- SAP Task Lists (Standard Jobs)

This step is to be performed before the Tagger isolates the equipment or process.

FC: 7.1.3 USE AN ISOLATION EQUIPMENT OPERATOR TO OPERATE THE ENERGY ISOLATING DEVICE(S)

The purpose of this step is to isolate the equipment or process and keep it from operating.

Energy Isolation Devices must be in the isolated position before a Status Tag is installed.
You could be injured if you improperly operate an Energy Isolating Device.

Only an Isolation Equipment Operator can operate an Energy Isolating Device. In some instances, the Tagger may be the Isolation Equipment Operator.

Isolation is performed once for each energy isolating device.

The Tagger is accountable for identifying the energy sources.

The Isolation Equipment Operator is accountable for using proper methods for isolation and de-energization. More than one person may be involved in the isolation step and the time involved will vary depending on the type of isolation that is required.

Isolating must be performed before the Status Tag is installed.

FC: 7.1.4 INSTALL THE COMPLETED STATUS TAG ON THE ENERGY ISOLATING DEVICE

The purpose of this step is to protect equipment and control hazards by installing a Status Tag on the Energy Isolating Device(s).

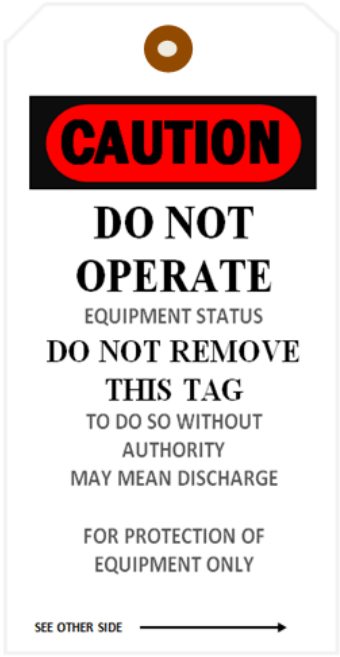
When Status Tags are used to protect equipment and control hazards, they must be installed on energy isolating devices.

The Tagger will install a status tag on the energy isolation device(s) for the equipment that is defective or unsafe to operate. One status tag must be installed for each energy isolating device.

The status tag is installed after the Energy Isolation Device(s) is in the isolated position.

EXAMPLE: **Status Tag**

FRONT



BACK

FC: 7.1.5 INFORM THE PERSON IN CHARGE OF THE EQUIPMENT OR PROCESS

The purpose of this step is to communicate with the person in charge that the equipment has been isolated and status tagged.

The person in charge of the equipment or process must be aware of equipment or process status and that the equipment or process has been isolated.

Some of the things that the person in charge is concerned about:

- What is wrong with the equipment or process?
- Is there any other equipment effected?
- What is required to repair the equipment or process?

The Tagger is responsible for performing this communication.

The communication should clarify to the person in charge of the equipment, why the equipment or process was isolated and status tagged.

This step is to be performed after equipment or process is isolated and status tagged.

FC: 7.1.6 REPORT THE CONDITION TO THE PERSON IN CHARGE OF THE EQUIPMENT OR PROCESS

The purpose of this step is to communicate to the person in charge the condition of the equipment or process.

You have discovered a piece of equipment or process that should not be allowed to operate but you cannot safely shut it down.

The person in charge of the equipment or process must be informed of the condition of the equipment or process.

Some of the things that the person in charge will have to know about:

- What is wrong with the equipment or process?
- Is there any other equipment effected?
- What is required to repair the equipment or process?

The communication, should clarify to the person in charge, the condition of the equipment or process.

A worker is responsible for performing this step once a problem is discovered with the equipment or process.

FC: 7.2 REMOVAL OF STATUS TAG FOR DOING WORK AS STATED ON THE STATUS TAG

This flowchart path outlines the steps taken when removing Status Tags. These steps are taken once a Tagger determines that a Status Tag is no longer required.

FC: 7.2.1 INSTALL YOUR PERSONAL PROTECTION

The purpose of this step is to secure the equipment with personal protection before removing the Status Tag

The Tagger has determined that he or she will be doing the work that is described on the Status Tag. The Tagger must install the personal protection before removing the Status Tag. In this way, the equipment is not left unsecured when the Status Tag is removed.

EXAMPLE:
An air compressor has been status-tagged because the pressure relief valve has not been installed. The Tagger wants to install the pressure relief valve and removes the Status Tag before locking out the primary mover. An equipment operator might start the air compressor while the Tagger is away finding an Isolation Equipment Operator to de-energize the prime mover.

The Tagger must install the personal protection before removing the status tag. Installing personal protection is described in procedure *SAF-ZES-60002 Tagger Installing Personal Protection.*

FC: 7.2.2 REMOVE THE STATUS TAG

The purpose of this step is to remove the Status Tag when doing the work described on it.

The Tagger has installed their personal protection to do the work that is described on the Status Tag.

The Status Tag is no longer needed and the Tagger has the authority to remove it.

The Tagger removes the Status Tag and disposes it. The Status Tag will be ripped in half and discarded into the garbage once it is removed from its application.

IMPORTANT:

The tagger must use due diligence when removing a status tag. They must be certain that:

- They understand the reason for the Status Tag
- They are doing the work that the Status Tag refers to

The Tagger removes the Status Tag after securing the equipment by installing his or her personal protection. The Tagger will be completing the work described on the Status Tag.

A Note on Due Diligence:

If the Tagger does not complete all the work identified on the Status Tag being removed and discarded, the Tagger must affix a new status tag identifying outstanding work to be done so that the equipment will remain secured in the isolated state to protect equipment and control hazards.

If necessary, multiple Status Tags can be used so as to clearly identify remaining work to be done.

FC: 7.3 REMOVAL OF A STATUS TAG TO RELEASE EQUIPMENT OR PROCESS AS STATED ON THE STATUS TAG

The purpose of this process flow is to outline the steps required when removing a Status Tag to release the hold on the equipment or process.

FC: 7.3.1 REMOVE THE STATUS TAG

The purpose of this step is to remove the Status Tag when the equipment or process hold is no longer required.

Note:
The tagger must use due diligence when removing a status tag. They must be certain that:

- They understand the reason for the status tag.
- They are authorized to remove holds from the equipment involved.

The Status Tag will be ripped in half and discarded into the garbage once removed from its application.

This step is performed when the Tagger determines that the Status Tag is no longer required.

7.0 APPENDICES

APPENDIX A: Revision Notes

Appendix A: Revision Notes

Revision notes describe what was changed, and if applicable, why it was changed, and the plan to implement the change, including whether changes are retroactive. The revision notes are a summary of the changes and may not necessarily be a complete list. A risk code is entered each revision and if applicable, the revision notes will describe how risk was addressed for the revision

Risk Code:	Risk Category
A	The revision is a minor change and/or introduces no risk.
B	Risk has been addressed for this revision by the reviewer and approver. Low risk or no new hazards identified.
C	For this revision, a risk management tool has been used to address risk and minimize hazards. This risk assessment has been document and is available through Maintenance Engineering.

Rev	Revision Notes
5	July 25, 2019 ownership of ZES Program transitioned to Ontario Operations Safety, Central Services. Risk Code A – minor change and introduces no risk. Changes include: Header of program documentation and reference number changes for example: MPROC-60000 now SPI-ZES-60000. Location of documents and forms on Websites remain the same. FORMS have no change other than "reference numbers" to the documents where applicable.
4	Revision of **Section 2 - Application** to clarify locking and tagging requirements for different voltages and involvement levels required of Electrical Department and Power Department. Risk Code for this revision is **A** – The revision introduces no risk.
3	Ontario Operations Zero Energy State Locking & Tagging Program, Section 6 Procedures, 6.7 Flowchart 7 and its related CPQQRT 1. Formatted content into a maintenance standard "procedure" document: *MPROC-60007 Status Tags – Installing and Removing.* The reason for reformat: • To update the format to meet the minimum requirements of documents maintained in the recently established Maintenance Standard Document Management System • To maintain the procedure on the Maintenance Standards Website for easy access for internal and external reference. 2. Updated graphics for Status Tags 3. Updated wording "Standard Job" to include wording "SAP – Task List" which is new terminology for standard job templates in the SAP system. 4. In procedure, step 7.2.2 Remove the Status tag, a Note on Due Diligence has been added: "If the Tagger does not complete all the work identified on the Status Tag being removed and discarded, the Tagger must affix a new status tag identifying outstanding work to be done so that the equipment will remain secured in the isolated state to protect equipment and control hazards. If necessary, multiple Status Tags can be used so as to clearly identify remaining work to be done."
2	March 31, 2009 **Ontario Operations Zero Energy State Locking & Tagging Program Ontario** Division changed its organizational structure. ZES Program document updated: "Section 7 – Accountabilities" to reflect the new organization structure
1	June 15, 2008 Implemented the **Ontario Operations Zero Energy State Locking and Tagging Program**