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1.0 PURPOSE

This procedure describes the mandatory process required to make changes to the ZES Program.

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	<ul style="list-style-type: none"> Employees must be trained and qualified to ZES003
Greater than 600 volts and up to 15kV	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 used 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

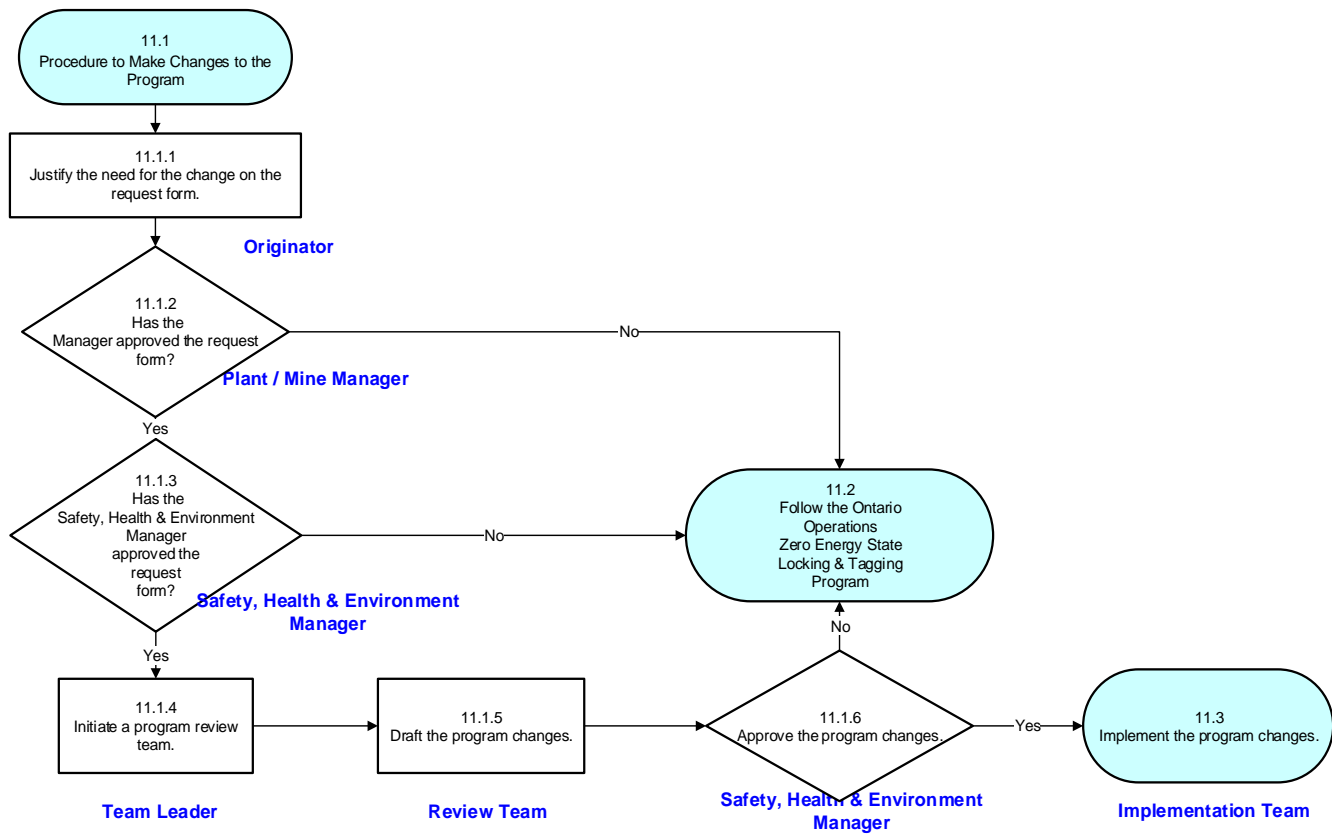


Zero Energy State: a state where all hazardous energy has been isolated and de-energized, or otherwise controlled to manage risk.

5.0 PROCEDURE TO MAKE CHANGES TO THE PROGRAM

The purpose of this flowchart is to outline the steps required for developing and approving changes to the Zero Energy State Locking and Tagging Program.

**Procedure to Make Changes to the Program
ZES Flowchart #11**



6.0 ZES PROCEDURE – FLOWCHART #11

FC: 11.1 REQUESTING A CHANGE TO ZES PROGRAM

Persons at a plant may recognize a need to modify portions of the Ontario Operations Zero Energy State Locking and Tagging Program (program). This would affect all plants and mines within the Ontario Division.

The Manager of Safety, Health & Environment is accountable for program changes.

Resources that can be used in this process include the following:

- SHEAC Committee.
- Manager of Engineering and Maintenance.
- Program Change Request Form

FC: 11.1.1 JUSTIFY THE NEED FOR THE CHANGE ON THE CHANGE REQUEST FORM

The Program Change Request Form captures all the pertinent information and authorizations that are required for a program change request.

The originator of the request must complete the form. The form outlines the program change that is being proposed.

The originator must complete the program change form including:

- The reason for the request.
- Background information.
- Impact on safety.
- Alternatives.

The plant / mine manager must approve the request before it is forwarded to the Manager of Safety, Health & Environment.

This step is performed every time a program change to the Ontario Operations Zero Energy State Locking and Tagging Program is requested.

A sample Program Change form is displayed on the next page.

PROGRAM CHANGE – Request Form SAMPLE

Ontario Operations Zero Energy State Locking and Tagging Program ZES Program Change Request Form			
Originating Plant: North Mine		Date: April 1, 2006	
Originator: Pat Rainer			
Reason for the Request: (State why the locking and tagging program should be changed.) To enhance auditing capabilities by introducing record logs for the opening and closing of all energy isolating devices.			
Background Information: (Include such things as history, investigation recommendations and best practices.) The former locking and tagging process used log sheets for electrical disconnects that were located in switchrooms. These were referred to whenever there was a tagging incident.			
Impact on Safety: (Will the program change reduce / increase the risk of a downgrading incident?) The change should enhance the program. Compliance will be easily audited because records will exist. Recurring training on the record logging will be required.			
Alternatives: (What are some other things that have been considered in lieu of a program change?) Continue as we do now.			
Approval to send request to the Manager of Safety, Health & Environment:			
<input type="checkbox"/> Approved	Plant / Mine Manager's Signature:	Date	
Approval to develop the draft program change:			
<input type="checkbox"/> Approved	Manager of Safety, Health & Environment:	Date	Development Team Leader
Approval to implement the program change:			
<input type="checkbox"/> Approved	Manager of Safety, Health & Environment:		Date
<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;"> <p>Note: The Manger of Safety, Health & Environment must approve the program change before it can be implemented.</p> </div>			
<p>The use of this form is described in SAF-ZES-60011 - Procedure to Make Changes to the ZES Program Revised April 2019</p>			

FC: 11.1.2 HAS THE PLANT/MINE MANAGER APPROVED THE CHANGE REQUEST?

The originator has explained the need for a program change to the Ontario Operations Zero Energy State Locking and Tagging Program by filling in the program Change Request Form.

The plant / mine manager must approve the form before forwarding it to the Manager of Safety, Health & Environment.

If the mine / plant manager does not believe a program change is required, proceed to Step 11.2 – Follow the Ontario Operations Zero Energy State Locking and Tagging Program.

If the mine / plant manager approves making the request for change, the mine / plant manager's approval will be recorded on the program Change Request Form.

The mine / plant manager will forward the form to the Manager of Safety, Health & Environment.

FC: 11.1.3 HAS THE MANAGER OF SAFETY, HEALTH & ENVIRONMENT APPROVED THE CHANGE REQUEST?

The plant/mine manager has approved the form and forwarded it to the Manager of Safety, Health & Environment

If the Manager of Safety, Health & Environment approves the request for change, he or she will proceed to Step 11.1.4 – Initiate a Program Review Team.

If the Manager of Safety, Health & Environment rejects the request for change, he or she will return the request providing feedback on the reason for the rejection. The plant will follow the existing Ontario Operations Zero Energy State Locking & Tagging Program.

FC: 11.1.4 INITIATE A PROGRAM REVIEW TEAM

The Manager of Safety, Health & Environment has approved the development of the program change by signing the program Change Request Form.

The Manager of Safety, Health & Environment will assign a team leader to manage the program review.

The team leader will put together a team to review the program and draft the program changes. The team leader's name will be recorded on the form.

The team should include at minimum:

- The team leader
- A representative from the originating plant (i.e. worker rep)

Resources:

- Plant / mine representatives
- SHEAC members
- Safety Department

FC: 11.1.5 DRAFT THE PROGRAM CHANGES

The purpose of this step is to develop the draft program change.

The team leader has formed a team to develop the program change. The team must have a good understanding of the existing program and the proposed change.

The team will develop the draft program changes after reviewing:

- Current regulations and standards.
- Pertinent incident investigations.
- Approved variances of the Ontario Operations Zero Energy State Locking and Tagging Procedure.
- Program audit reports.

The team may also:

- Recommend changes beyond those requested.
- Recommend that the requested change be rejected.

The draft changes should have an independent review by persons who were not involved in the change development.

Resources for this work can include the following:

- The team
- Regulations and Standards
- Incident Reports
- EMOC records for variances
- Program audit reports
- Plant / mine representatives.
- SHEAC members.
- Safety department.
- Training department.

FC: 11.1.6 APPROVE THE PROGRAM CHANGES

The purpose of this step is to approve the program changes to the Zero Energy State Locking and Tagging Program.

The team has developed program changes. The changes have been independently reviewed.

The Manager of Safety, Health & Environment must review the draft program change and will grant the approval to implement the change or reject it.

If approved, the Manager of Safety, Health & Environment approves the drafted program changes, he or she will sign the program change request form to indicate their approval and proceed to implement the program changes.

If rejected, the Manager of Safety, Health & Environment will return the request providing feedback on the reason for the rejection. The plant will follow the existing Ontario Operations Zero Energy State Locking & Tagging Program.

FC: 11.2 FOLLOW THE ONTARIO OPERATIONS ZERO ENERGY STATE LOCKING & TAGGING PROGRAM

The purpose of this step is to make it explicitly clear that the Zero Energy State Locking and Tagging Program must be followed.

If the Safety, Health & Environment Manager determines that a program change is not required, the Ontario Operations Zero Energy State Locking and Tagging Program must be followed.

The Safety, Health & Environment Manager will inform the plant/mine manager when rejecting a program change and explain the reason(s) for the rejection.

The plant/mine manager will inform the originator when a request for a program change has been rejected and explain why.

FC: 11.3 IMPLEMENT THE PROGRAM CHANGES

The purpose of this step is to implement the approved changes to the Zero Energy State Locking and Tagging Program.

The Manager of Safety, Health & Environment has approved the program change to the 'Zero Energy State Locking and Tagging Program'.

The Manager of Safety, Health & Environment will appoint a team to implement the approved change(s). The plan will include:

- Updating the program standard documentation / ZES Website.
- Updating the record of program revisions.
- Communicating the program change to the mine/plant managers along with any specific requirements that they must put in place to implement the change(s).
- Communicating the revisions to stakeholders

Learning & Development will:

- Update training modules.
- Update Web based information.
- Communicate changes to training agents (as is applicable)



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, 6.10 Flowchart 11 and its related CPQQRT 1. Formatted content into a maintenance standard “procedure” document: <i>MPROC-60011 Procedure to Make Changes to the Program</i> . The reason for reformat: <ul style="list-style-type: none"> • 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 Flowchart and procedure wording to reflect change in role holder responsibility for Manager of Central Maintenance – changed to Engineering & Maintenance Manager. 3. Program Change Form updated to reflect role holder description (as per above) and reference added to related procedure MPROC-60011 Procedure to Make Changes to the Program
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