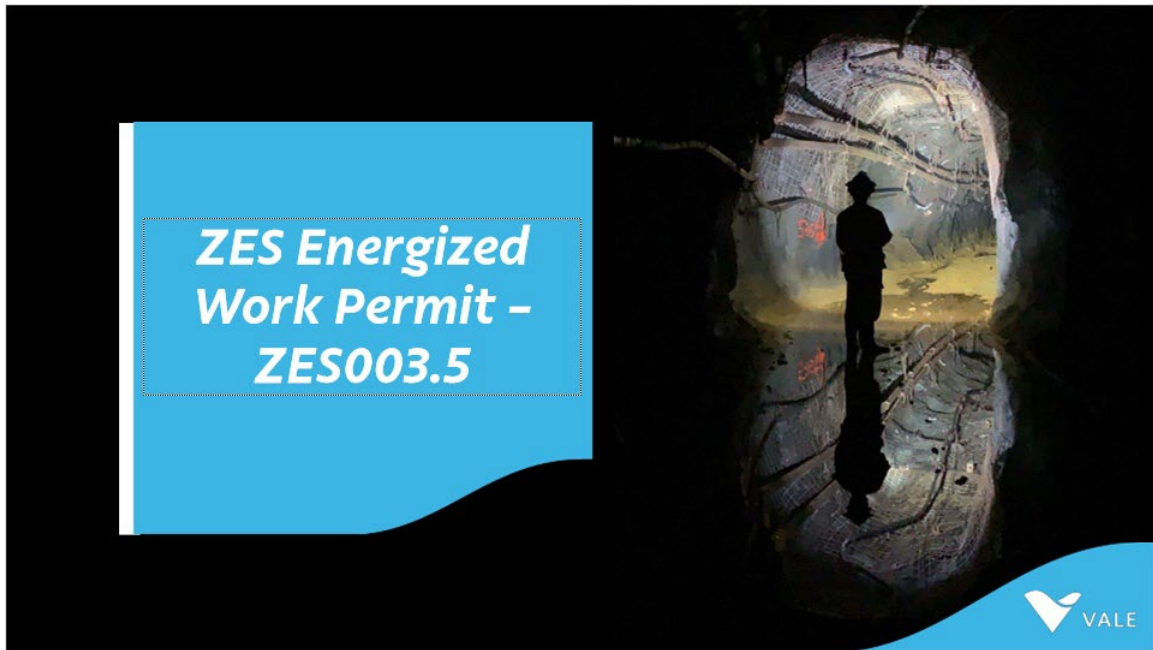


## ZES Energized Work Permit - ZES003.5

### 1. Energized work permit role out ver 4

#### 1.1 ZES Energized Work Permit - ZES003.5



## 1.2 Ontario Regulations

### Context

It is understood that there are tasks where it is not practical to achieve Zero Energy when working on equipment but working on energized equipment involves significant risks and requires strict adherence to safety protocols to prevent accidents and injuries. It is essential to identify these scenarios where it may be impractical to achieve Zero Energy—meaning complete de-energization of equipment before maintenance or repair.

**Ontario Regulations provide for such work to be done on energized equipment provided the following is completed:**

1. When working around equipment that cannot achieve Zero Energy due to a specific task being undertaken, a risk assessment shall be completed with controls put in place protecting the worker from hazardous energy sources.
2. A Live work permit shall be completed where applicable (with the controls in place from the risk assessment) and signed off by workers and management.



## 1.3 Guidelines for Working on Energized Equipment

### Guidelines for Working on Energized Equipment

#### Risk Assessment

Prior to starting work on energized equipment, perform a detailed risk assessment. Consider the following factors:

- Type of Equipment: Evaluate the equipment and its operating characteristics.
- Nature of Task: Determine if the task can be done safely under energized conditions.
- Potential Hazards: Identify electrical, mechanical, thermal, and other hazards related to the task.

#### Reference Manufacturer or OEM Manuals

Always refer to the equipment's manufacturer or Original Equipment Manufacturer (OEM) manuals. These documents may provide guidance on:

- Necessary precautions for working on energized components.
- Specific tasks that can be performed safely without de-energizing.
- Recommended tools and personal protective equipment (PPE).



## 1.4 Establish Safe Work Practices

### Establish Safe Work Practices

*Implement safe work practices when working on energized equipment. Examples include:*

- Lockout/Tagout (LOTO): Use LOTO procedures wherever possible, even if complete de-energization is not achievable.
- PPE Requirements: Ensure that the appropriate PPE is used, including insulating gloves, face shields, and protective clothing.
- Safety Barriers: Utilize barriers to protect workers from exposure to energized parts.
- Two-Person Rule: Consider having a second qualified person present to help monitor safety.

### Training and Qualifications

Ensure that all personnel working on energized equipment are adequately trained and qualified. Training should cover:

- The risks associated with energized work.
- Proper use of equipment and tools.
- Emergency response procedures.

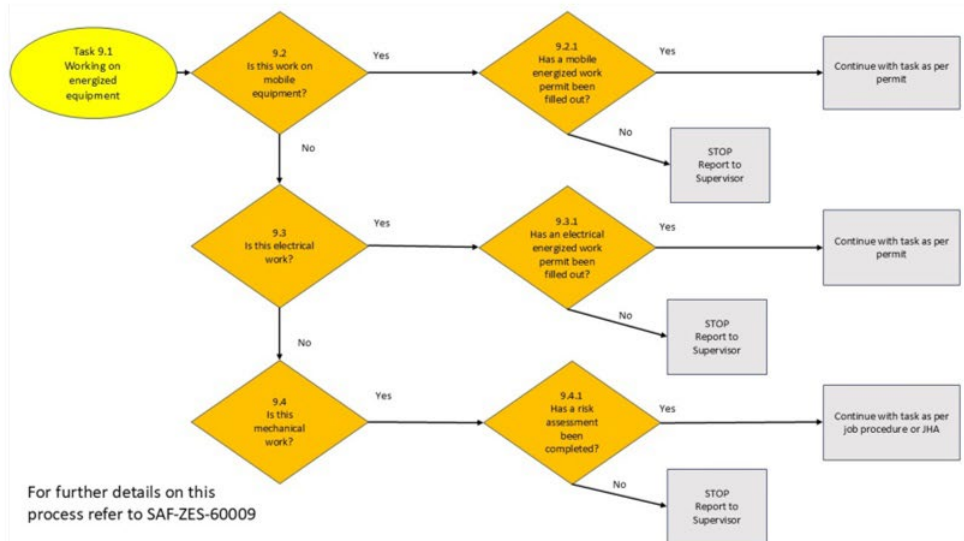
### Emergency Preparedness

Prepare for emergencies by establishing:


- Clear procedures for responding to all incidents.
- Access to emergency shut-off controls.



## 1.5 Working on Energized Equipment




## 1.6 Select to Continue




**IS THIS ELECTRICAL WORK?**  
WORKING ON ELECTRICAL EQUIPMENT.

[Click Here](#)




**IS THIS MECHANICAL WORK?**  
WORKING ON MECHANICAL EQUIPMENT.

[Click Here](#)



**IS THIS WORK ON MOBILE EQUIPMENT?**  
WORKING ON MOBILE EQUIPMENT.

[Click Here](#)



## 1.7 Electrical Energized Work Permit

Internal Information

**Electrical  
Energized Work  
Permit**



## 1.8 IS THIS ELECTRICAL WORK?

### IS THIS ELECTRICAL WORK?

The objective of Vale's initiative since 2009 has been to align with CSA Z462, which focuses on workplace electrical safety. A key aspect of this effort is the proactive reduction of energized electrical work wherever feasible. When it's unavoidable, the introduction of "Energized Electrical Work Permits" (permits) becomes essential. These permits serve as detailed risk assessments designed to enhance safety protocols and integrate with Vale's overarching safety management systems. The overarching principle guiding this initiative is the firm belief that energized electrical work should be minimized to ensure the safety of all personnel involved.

#### *Electrical work*

Electrical work involves tasks related to the installation, maintenance, alteration, or repair of electrical systems and equipment. This includes working with wires, cables, conduits, and electrical devices that generate, transform, transmit, or use electrical energy for various purposes such as lighting, heating, and power.

There are specific exemptions to the requirement for an energized electrical work permit. A qualified person can perform certain tasks without an energized electrical work permit if they use appropriate safe work practices and personal protective equipment (PPE).

1. Testing, troubleshooting, or voltage measuring.
2. Thermography, ultrasound, or visual inspections provided the restricted approach boundary is not crossed.
3. Access to and egress from an area with energized electrical equipment, as long as no electrical work is performed, and the restricted approach boundary is not crossed.
4. General housekeeping and miscellaneous non-electrical tasks, again provided the restricted approach boundary is not crossed



## 1.9 IS THIS ELECTRICAL WORK?

### IS THIS ELECTRICAL WORK?

Contact your Supervisor and follow the Vale Ontario Operations Electrical Safety Program for procedures on how to use the Energized Work Permit for Electrical Work.

*This will include the following MPROC's:*

MPROC-51001	<i>Electrical Shock Safeguarding</i>
MPROC-51002	<i>Arc Flash and Arc Blast Safeguarding</i>
MPROC-51005	<i>Arc Flash Protection and Energized Work</i>
MPROC-51007	<i>Energized Electrical Work Procedure</i>



## 1.10 Mechanical

Internal Information

# Mechanical Energized Work Permit



## 1.11 IS THIS MECHANICAL WORK?

### IS THIS MECHANICAL WORK?


**Mechanical work**

Mechanical work are maintenance tasks being completed on stationary equipment such as conveyors, mills, hoists, pumps, etc. generally completed by Industrial Mechanics or Millwrights.

Working on energized mechanical equipment requires strict safety protocols to ensure the safety of everyone involved. One of the following need to be used for the work to be completed:

1. Specific Job Procedure: This involves having a detailed, step-by-step procedure tailored to the specific equipment being worked on in an energized state, ensuring all necessary precautions are taken and the work is performed safely and efficiently.
2. JHA (Job Hazard Analysis) Risk Assessment: This involves identifying potential hazards associated with the task of working on an energized piece of equipment and developing strategies to mitigate those risks. A thorough JHA helps in understanding the risks and implementing controls to prevent accidents. Both measures are essential to maintain a safe working environment when dealing with energized equipment

*Contact your Supervisor for further direction on how to continue with the task.*





## 1.12 Mobile



## 1.13 Notification of Event

**Context**

On July 3rd, 2023, at Coleman Mine an HDET sustained a reportable injury when his hand was injured when performing maintenance on the feed assembly.

### NOTIFICATION OF EVENT

☒ EVENT WITH PERSONAL LOSS ☐ EVENT WITH ENVIRONMENTAL LOSS ☐ EVENT WITH MATERIAL LOSS ☐ EVENT WITH COMMUNITY LOSS ☐ OPERATIONAL OCCURRENCE ☐ EVENT WITH NO LOSS

HEAD, MINING OPERATIONS NA (S)

**DESCRIPTION:**  
Running repairs/adjustments were being carried out to a Boltec carousel arm to align a self drilling connectable bolt to the striking bar. A worker grabbed the bolt when the operator of the Boltec was asked to open the jaws. The operator of the Boltec pressed the incorrect button and instead of the jaws opening, the arms moved into the carousel pinching the workers finger. The Boltec operator immediately moved the arms away from the carousel but the workers finger was severely cut. The worker was transported to surface and immediately taken to hospital.

	SEVERITY (SAFETY)	SEVERITY (ENVIRONMENT)	SEVERITY (FINANCIAL)	SEVERITY (SOCIAL)
ACTUAL	Moderate	No Consequences	No Consequences	
POTENTIAL	Moderate	No Consequences	No Consequences	

ID	17132047
DATE	Jul 3, 2023
TIME	10:20:00 AM
LOCATION	Coleman Mine - 153OB / ID: 2572
ASSOCIATED RAC	NA : Not applicable

VALE


## 1.14 Why are we here?

### Why are we here?


High Potential Event

Re-enactment – Field Location

IP grabbed the bolt to prevent it from dropping onto the machine when the jaws opened but instead the arm moved and pinched IP's finger



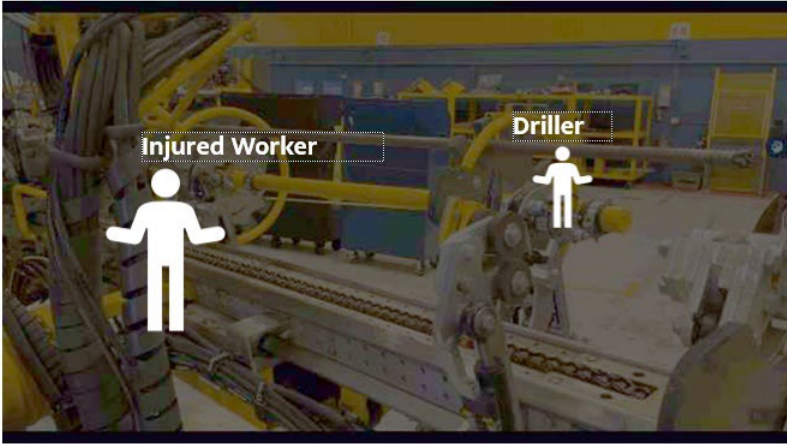
FOR INTERNAL USE ONLY:  
This document is owned by Vale and must be used only for internal communications




## 1.15 High Potential Event

### High Potential Event

Motion of the bolt going to the carousel



FOR INTERNAL USE ONLY:  
This document is owned by Vale and must be used only for internal communications



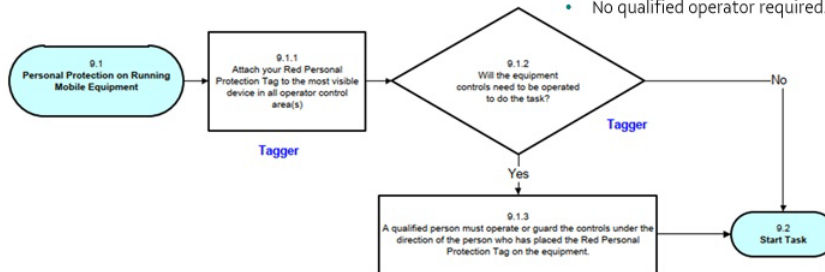


## 1.16 Running Repairs

### Context

As a result of the investigation a gap in our ZES program was identified when performing testing and adjustments "Running Repairs" on mobile equipment while the equipment is energized.

Personal Protection on Running Mobile Equipment ZES Flowchart #9



Our previous program was as follows

#### 1. Running Repairs

Running repairs with power on "key on" engine not running and the electric motor is not energized.

- Personal protection tag required in the operator's cab.
- Qualified operator required in the operators control area.

#### 2. Running Repairs

Running repairs with key on and the engine running or electric/hydraulic motor is energized.

- Personal protection tag required in the operator's cab.
- No qualified operator required.

## 1.17 Regulation 854 Mine and Mining Plant

### Context

The investigation revealed the following gap in Vale's ZES program:

If it is not practical to comply with subsection 185(7). What information and instructions will be provided to workers on what may be done on mobile equipment to comply with 185(10) barriers shields or other effective precautions are used or taken for the safety of the worker.

We received an MOL order to provide a plan for a process to meet the requirements of 185.

A team was created that included Workers, Leadership and the JHSC team. The conclusion of this work was the **Energized Work Permit**. The permit was then reviewed with the team, workers and MOL that approved the process.

### Regulation 854 Mine and Mining Plant

#### Section 185

(7) If any work is being done on a machine,

- the moving parts shall be stopped;
- any stored energy that could be a hazard to workers shall be dissipated or contained;
- energy isolating devices shall be installed if the machine is not already equipped with them; and
- all energy isolating devices shall be properly engaged, locked and tagged. O.Reg. 31/04, s.10; O.Reg. 69/23, s.27.

(8) Before doing any work to which subsection (7) applies, a worker shall verify, by testing, that the requirements of that subsection have been complied with. O.Reg. 31/04, s.10.

(9) A tag required by clause (7) (d) shall,

- be secured to prevent its accidental removal;
- state the reason the energy isolating devices are locked and tagged;
- show the name of the person responsible for locking and tagging the energy isolating devices; and
- show the date on which the energy isolating devices were locked and tagged. O.Reg. 31/04, s.10.

(10) If it is not practical to comply with subsection (7), work to which that subsection applies may be done if, while it is being done, barriers, shields or other effective precautions are used or taken for the safety of a worker. O.Reg. 31/04, s.10; O.Reg. 265/15, s. 12.

## 1.18 Purpose

### Purpose

Coleman created a team to address the gap in the ZES program. The team included Workers, Leadership and the JHSC team. The conclusion of this work was the **Energized Work Permit**. The permit was then reviewed with the team, workers and MOL that approved the process.

### Order received

2	Plan	OSHA	1990	57	4
15785NDW892					
An order made under subsection (1) may require a 2023 constructor, a licensee or an employer to submit to the ministry a compliance plan prepared in the manner and including such items as required by the order.					
Provide the undersigned inspector a compliance plan with dates on how the employer Vale Canada Limited at the Coleman Mine will ensure when a worker is performing work on a machine, they are compliant with Ontario Regulation 854 section 185. The plan shall include but not limited to what information, instruction will be provided to workers and supervisors on what work being performed on mobile equipment requires compliance to 185 (7). If it is not practical to comply with subsection 185(7). What information and instruction will be provided to workers on what work may be done on mobile equipment to comply with 185(10). How the manufactures operations and maintenance manuals will be referenced in the work being performed and how the employer will ensure if work is being performed under section 185(10) barriers, shields or other effective precautions are used or taken for the safety of a worker.					

### Compliance Plan

Field Visit	No.	Type	Act Reg.	Year	Sec.	Sub. Sec.	Compliance Detail	Due Date
045785NDV889	2	Plan	OSHA	1990	57	4	1. Jointly Review ZES policy for section currently named running repairs and revise. Examples of revisions will include: Terminology and the addition of a Decision tree. Revision to include: - Communication requirements. - References to OEM manuals. - Barricades or suitable controls.	Dec 31, 2023

The **Energized Work Permit** is designed to address the revisions detailed in the compliance plan.

## 1.19 Quality

### Quality

It is understood that there are tasks that are required to be done while equipment is still energized, and all energy sources are not locked and tagged.

#### Questions to be asked when assessing the task:

1. Does the equipment need to be energized to perform this task?
  - Refer to OEM manual when possible.
2. Does the equipment need to be operated with controls?
  - A qualified operator is required.

#### Regulation 185(10) allows for work to be done on energized equipment provided the following is completed:

1. An '**Energized Work Permit**' requires completion which will identify hazards and their controls, **which must be authorized by supervision.**
2. As identified through the 'Energized Work Permit', a field level risk assessment may be required which shall be completed with identified controls put in place protecting the worker from hazardous energy sources. **If the worker cannot control all the hazards, the work shall not proceed.**

Currently the **Energized Work Permit** is being implemented at the plant level to allow for compliance to sec 185(10).

A formal role out of the entire revised ZES program is currently being developed.

MOC #24730 was created at Coleman for the use of the **Energized Work Permit** and replicated at the other plants.

CCM has created MOC #25447 to support the implementation of the **Energized Work Permit**.

## 1.20 Quality

### Quality

#### How does it work?

Prior to a member(s) of the Mobile Team performing running repairs (testing and adjustments) on a piece of mobile equipment, they are to complete an **Energized Work Permit**.

#### Information required

1. Work Location - level, shop, other
2. Date
3. Equipment ID - Unit Number
4. Equipment description - Equipment type and Model
5. Task(s) that require energization - this can include more than one task example t/s the lights and hydraulic leak
6. Name of technician(s) - more than one technician can be indicated on the permit, however only one technician is required to sign the permit. This is the technician that will be in control of the task and have their red personal protection tag is filled and attached to the most visible control device in all operating control area(s) prior to starting work.

The form is titled "Energized Work Permit" and is divided into several sections. At the top, there is a red header with a white circle. Below the header, the form is divided into sections: "Work Location", "Date", "Equipment ID", "Equipment Description", "Tasks that require energization", "Name of Technician(s)", and "INSTRUCTIONS". The "INSTRUCTIONS" section contains six numbered steps: 1. Complete Section A of this document (reverse) which will indicate subsequent sections to complete. 2. Do not proceed until all identified hazards are adequately controlled in the field. 3. Do not proceed until supervisor authorization received - Section D. 4. Ensure area is adequately roped off to restrict unauthorized access. 5. Ensure a red personal protection tag is attached to the most visible control device in all operating control areas prior to starting any work. 6. After the tasks requiring energization are complete the permit is no longer valid - full deenergization and lockout required.

## 1.21 Quality

### Quality

#### How does it work?

Prior to a member of the Mobile Team performing running repairs (testing and adjustments) on a piece of mobile equipment, they are to complete an **Energized Work Permit**.

The "INSTRUCTIONS" section of the form contains six numbered steps: 1. Complete Section A of this document (reverse) which will indicate subsequent sections to complete. 2. Do not proceed until all identified hazards are adequately controlled in the field. 3. Do not proceed until supervisor authorization received - Section D. 4. Ensure area is adequately roped off to restrict unauthorized access. 5. Ensure a red personal protection tag is attached to the most visible control device in all operating control areas prior to starting any work. 6. After the tasks requiring energization are complete the permit is no longer valid - full deenergization and lockout required.

**Ensure completed tags are returned to the Supervisor at the end of the task/shift**

The form continues with "Section A: Answer the following questions?" and "Section B: Record identified hazards". Section A contains six numbered questions with checkboxes for "Yes" and "No" and instructions on what to do next. Section B contains a table for recording hazards with columns for "Hazard", "Comments", and "Status". The table has three rows for "Hazard", "Comments", and "Status". Below the table, there is a section for "Supervisor Authorization" with a checkbox for "Supervisor authorization required".

## 1.22 Examples

### Examples of tasks that requires an Energized Work Permit.

1. Anytime the key is on for testing or adjustments
2. Anytime the engine is required to run for testing or adjustments
3. Anytime an Electric motor is energized for testing or adjustments

Examples of tasks that require an energized work permit		
Task	Hazards of Energized work	Potential Controls (note this is just a sample others may be identified by the technician)
Boosting a Kubota	Mobile equipment	Wheel chocks, Jaws, Radio protocol, Ramp parking, Pre-op, Qualified Operator at the controls
	Explosion (of the battery)	Ensure the negative is the last lead connected, PPE, Inspection of the battery and leads
	Rotating equipment	Fan shroud, awareness of rotating equipment
	Acid burns	PPE, Pre-op
T/S Hydraulic leak on the feed of a Maclean Bolter	Hydraulic injection	PPE, Ensure hands are clear of hoses, Pre-op (Inspect prior to running the unit to looks for obvious leaks, damage etc.)
	Entanglement	Ensure qualified operator at the controls when the unit is operating, Maintain 3 feet from potential rotating and moving components, loose clothing and
	Mobile equipment	Wheel chocks, Jaws, Radio protocol, Ramp parking, Pre-op, Qualified Operator



## 1.23 Examples

### Examples of tasks that requires an Energized Work Permit.

1. Anytime the key is on for testing or adjustments
2. Anytime the engine is required to run for testing or adjustments
3. Anytime an Electric motor is energized for testing or adjustments

Examples of tasks that require an energized work permit		
Task	Hazards of Energized work	Potential Controls (note this is just a sample others may be identified by the technician)
T/S a no start of a loaded haulage truck on the ramp	Mobile equipment	Barricade, Wheel chocks, Jaws, Radio protocol, Ramp parking, Pre-op, Qualified Operator, good communication
	Explosion (of the battery)	Ensure the negative is the last lead connected, PPE, Inspection of the battery and leads
	Rotating equipment	Fan shroud, Drive line guards, awareness of rotating equipment
	Mounting and Dismounting	Three-point contact, railings, proper footing
	Fuel under pressure, when bleeding/verifying fuel delivery	PPE, ensure hot surfaces are shielded, Clean up fuel spills.
	Crush, if going under the unit is required	Ensure proper stands are under the unit (they just need to be under in the event of a tire failure)
Boom inspection on a Boltec (when the equipment is operated, and a technician looks for abnormalities with the boom/feed assembly	Hydraulic injection	PPE, Ensure hands are clear of hoses, Pre-op (Inspect prior to running the unit to looks for obvious leaks, damage etc.)
	Entanglement	Ensure qualified operator at the controls when the unit is operating, Maintain 3 feet from potential rotating and moving components, loose clothing and
	Mobile equipment	Barricade, Wheel chocks, Jaws, Radio protocol, Ramp parking, Pre-op, Qualified Operator, good communication



## 1.24 Memo

**Memo**



**Memo**

**To:** CCM Employees and Contractors.

**CC:** Stephanie Belar, Ryan Vain, Thomas Oberhead, Jim Hering, Tracy Miller, Nicholas Ceccori

**From:** Bill Bailey

**Date:** 1/24/2025

**Re:** HDET Energized work permit safety talk – Draft

**Context:**

On July 31, 2023, an HDET at Coleman sustained a serious hand injury while carrying out running repairs on the feed/circuit assembly of an Espino Solar. As a result of the injury a new "energized work permit" is being implemented across the Sudbury operations. This work permit is in place to support HDET's when having to perform V's or adjustments to mobile equipment that must be energized to perform the work. Emergency is when the master switch is not locked out.

The permit requires an HDET to perform a risk assessment on the permit and review that risk assessment with their supervisor who will authorize the risk assessment prior to performing the work. The supervisor can authorize the work over the radio/telephone or by visiting the HDET at the work site. If the supervisor is unfamiliar with the work or has questions with the proposed controls presented by the HDET they have the following options:

1. Stop the work and defer the repair until day shift when a Mobile Supervisor is available (no critical processes). Ensure a notification is entered indicating that an Energized Work Permit is required.
2. Escalate to the on call for support.

Please share this with your teams.

Any questions, please let me know.

Regards,  
Bill Bailey  
Maintenance Manager, CCM Complex

1



## 1.25 Questions

### Questions

**What happens to the tag after it is submitted to my Supervisor?**  
*The tag is audited for quality and compliance to the ZES program*

**Do I need authorization by a Mobile Supervisor?**  
*No – The Supervisor that lined you up and is on site is your resource for authorization.*


**What if I cannot mitigate the hazards?**  
*The work is to not proceed. The Supervisor is to determine if the work can wait till a Mobile Supervisor can be consulted or if the Senior On-call needs to be contacted.*

**If I cannot complete the work on my shift can the permit be transferred to the next shift?**  
*No – The Supervisor that lined you up must authorize the Energized Work Permit.*

**Can I complete the permit during the line up?**  
*The permit must be completed in the field by the technician(s)*

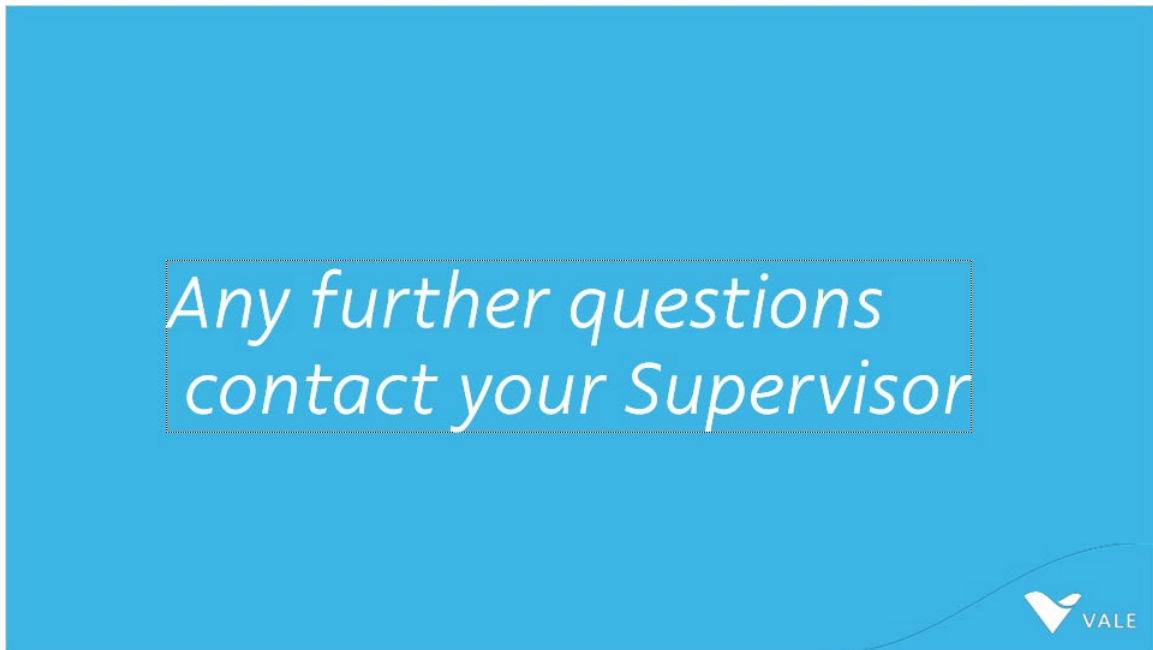
**Does the Supervisor need to be at the work site to authorize the work?**  
*No – The permit can be authorized over the radio/phone, the intent of the permit is to pause and perform a risk assessment.*

**Why do I need to install a barricade?**  
*Site control must be in place to control those entering the work area to ensure their safety from potential hazards.*





### **1.26 Any further questions?**



### **1.27 Start The Module Quiz**

