



[Life-saving rule\(s\)](#)

## Energy Isolation Standard

|                                      |  |  |                                   |
|--------------------------------------|--|--|-----------------------------------|
| <b>H&amp;S Discipline</b>            | Health & Safety  |  |                                   |
| <b>Custodian</b>                     | <a href="#">H&amp;S Programs &amp; Projects</a>  |  |                                   |
| <b>Program Category</b>              | Safe Work Management   |  |                                   |
| <b>Program</b>                       | Energy Isolation (lock-out-tag-out)  |  |                                   |
| <b>COMS</b>                          | <a href="#">3.1 Risk Identification and Assessment COMS Standard</a><br><a href="#">4.1 Identification of Risk Mitigation Measures COMS Standard</a><br><a href="#">4.5 Operating and Maintenance Procedures COMS Standard</a> |  |                                   |
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### Revision History

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| 3.0            | Merged Blanking & Blinding Practice with Energy Isolation Practice | 2018-06-04  | Mgr. HSER Programs                             |
| 2.0            | Old format, no rev. history  | 2011-11-17  | EHS Documentation                              |
| 1.0            | New document   | 2009-11-02  | EHS Documentation                              |

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### 1.0 Purpose

The purpose of the Energy Isolation Standard is to identify and mitigate all sources of hazardous energy in process systems/equipment/machinery/pipelines/piping etc. by providing the operational framework of approved isolation methods to reduce or eliminate the risk of workers being exposed to hazardous energy during operations, maintenance and repair activities.

Zero Energy state is achieved when all hazardous energy within the system being isolated, including stored or residual energy, has been dissipated and secured.

### 2.0 Scope

This standard applies to all Cenovus worksites and encompasses all work activities requiring zero energy isolation, including Cenovus Personnel, contractors and service providers. Please see hazardous energy exemptions 4.5 for items like trouble shooting, minor adjustments and exclusive control.

This standard provides requirements for the proper isolation, verification of the absence of energy, and control of energy sources prior to the start of work on equipment containing or having the potential to contain hazardous energy, examples include but are not limited to:

- Isolation of hazardous substances
- Pressure in piping and pressure system
- Isolation of electrical energy
- Isolation of mechanical energy
- Isolation of nuclear devices
- Potential energy

### 3.0 Roles and Responsibilities

The following responsibilities apply to the Energy Isolation Standard.

**Table 1: Roles and Responsibilities**

| Role                             | Description  |
|----------------------------------|--|
| Functions and Enabling Functions | <ul style="list-style-type: none"> <li>• Determine all hazardous energy sources and determine how the energy is applied to the equipment or machinery identified in the work scope</li> <li>• All equipment, machinery, process systems or piping intended to be part of the work scope must be identified and evaluated to determine what isolation is required</li> <li>• Determine all hazardous product sources and determine how the product may interact with</li> </ul> |

| Role                                      | Description   |
|---|---|
|   | <p>people, environment, equipment or machinery identified in the job scope</p> <ul style="list-style-type: none"> <li>• Identify isolation locations</li> <li>• Ensure all safeguards are in place prior to work commencing</li> </ul>  |
| Well Delivery                             | <ul style="list-style-type: none"> <li>• Work with Operations to determine all hazardous energy sources and determine how the energy is applied to the equipment they will be working on.</li> <li>• All equipment, machinery, process systems or piping intended to be part of the work scope must be identified and evaluated to determine what isolation is required</li> <li>• Identify isolation locations</li> <li>• Ensure all safeguards are in place prior to work commencing</li> </ul> |
| Major Projects                            | <ul style="list-style-type: none"> <li>• Design and planning of isolation systems and construction tie-points for new facilities</li> </ul>   |
| Facility Engineering                      | <ul style="list-style-type: none"> <li>• Engineering Approval of DIB and SIV work plans</li> </ul>  |
| Integrity Management                      | <ul style="list-style-type: none"> <li>• Manage blank and blinding specifications</li> </ul>  |
| Enterprise, Assurance, Compliance & Audit | <ul style="list-style-type: none"> <li>• Provide guidance when requested by Operations by completing OH&amp;S Regulation and Industry best practice reviews</li> </ul>  |

#### 4.0 Process Requirements

All energy sources must be identified in the isolation plan. All work performed on Cenovus sites will have an isolation plan prior to work commencing, however a hazard assessment must also be used to ensure that all energy sources are accounted for and effectively controlled. The isolation plan should address the following:

- The type of energy source and the energy isolation method needed
- The identification of authorized workers who are permitted to complete the required isolation
- Isolation procedures, verify procedure completeness, and ensure a zero energy state has been achieved
- Physical means of isolation that will be established
- Administrative controls to ensure that the physical means of isolation remain in place to protect workers
- Verification of zero energy prior to starting work

#### 4.1 Hazardous Energy or Substance

Identify all hazardous energy sources and determine how the energy impacts equipment or machinery identified in the work scope. All equipment, machinery, process systems, or piping included in the work scope must be identified and evaluated to determine if isolation is required.

Identify all hazardous substances and determine how the substance may interact with people, equipment or machinery identified in the job scope i.e. P&ID's/procedures etc.

#### 4.2 Equipment Blinding

Cenovus sites shall develop equipment isolation procedures for equipment requiring isolation. Refer to CVE assets for all detailed site specific isolation procedures and also reference OH&S codes AB & BC depending on the geographical location of the asset.

The following conditions apply:

- Blinding must be used for vessel entry. The terms Blank and Blind are used interchangeably at FCCL
- Under Alberta and BC OH&S, a stamped risk assessment is not needed for installation and removal of blinds as these tasks are encompassed under the Blinding and Line Break Procedures
- Blind installation and removal must be managed by means of a color coded two-tag system where blind locations are identified with a tag, or another type of administrative control.
- Prior to installation of blinds the asset/site specific LOTO Procedure must be followed
- When working on pipelines, cathodic protection must be shutdown or flanges bonded if blinding is required
- Stamped Pressure Rated blinds and gaskets MUST be used for all blinding, in accordance with ANSI Standard API-590: Steel Line Blanks. The use of pancake blinds at the equipment is sufficient where battery limit blinds are used for energy isolation
- If the visible markings do not clearly identify it as a blind or spacer, all work must be stopped until it can be verified.
- All vents and drains must be proven effective for release of trapped pressure prior to blind installation and removal.
- Spacers are typically used if the pipe size is >12" NPS, due to the physical limitations of spectacle blinds.
- Air gapping is an acceptable means of positive isolation. It's a state where the equipment is positively separated from the hazardous energy and toxic substance

### 4.3 Isolation Methods

The following methods of isolation are approved:

1. Double Block and Bleed; Creates a barrier between the pressure system and the target isolation area utilizing two separate valves with a proven bleed point between the valves.

Upstream valve shall be verified to be holding pressure. Its best practice to also verify the downstream valve when practicable.

2. Double Isolation and Bleed Valve (DIB); Noting that there are differences in construction as dictated by the governing code, (API 6D, ASME B31.3 or CSA Z662) some valves may have an inherent design that consists of a single valve with two dual piston effect (DPE) sealing surfaces and a means of bleeding the cavity between the seats. This may consist of a valve body with 3 integral independent valves or one valve body with live loaded seats and a bleed point.

Noting that it is impossible to determine the characteristics of a valve without reviewing the detailed OEM literature for the particular valve any such DIB valve to be used as equivalent double block and bleed isolation must be reviewed and approved by a Professional Engineer.

3. Single Isolation (SIV); Creates a barrier between the pressure system and the target isolation area utilizing a single valve. It is permissible to use a single isolation providing:
  - Single isolation is the least preferred method of energy isolation however, it is sufficient under OH&S to install blinds, refer to section 215.4 for additional details on blinding Refer to Cen-END PS12666. For Deep Basin refer to Process Isolation Standard WCBU-ENG-STD-683

### 4.4 Lock Removal

In an emergency or where the worker who installed the securement device is unavailable, the site supervisor or designate can only remove the securement device after first ensuring that no worker or facilities will be endangered by such removal. This type of personal lock removal is required to be documented and stored at the work site. All assets must have an emergency lock removal form.

### 4.5 Energy Isolation Exemptions

The following situations can be exempted from the application of the isolation practice:

1. *Direct or Exclusive control*; In the event that the energy isolation device or connection point is in direct control of the worker,
2. *Electrical work*; In the event that electrical work is required to be completed on a live circuit by a qualified electrician. The electrician must conduct their work in accordance with the Cenovus Electrical Safety Program, or the Electrical Work Procedure for Deep Basin.

#### 4.6 Lock-Out-Tag-Out Minimum Requirements

All workers, working on equipment that is isolated must attach their own personal lock securing device, to the lock box (e.g. breaker, switch, valve etc.). The first worker (usually the supervisor) must verify that the hazardous energy has been effectively isolated (bump test or function test) to ensure that a zero energy state has been accomplished. Administrative controls must be in place to ensure that the physical means of isolation remain in place to protect workers, including:

- Refer to Cenovus assets for all detailed site specific isolation procedures and also reference OH&S codes AB & BC depending on geographical location of the asset,
- If more than one worker is working at a location where hazardous energy sources have been isolated, the first worker (any worker however, working at the location can ask to verify zero energy has been achieved via a bump or function test) to apply their personal lockable securement device must verify that the hazardous energy source has been effectively isolated and ensure a zero energy state has been achieved. Each additional worker must apply their own lockable securing device to the lock box prior to commencing work,
- All tags or (lockbox worksheets) shall be signed by the individual installing them indicating the date and time installed,
- Personal lockable securement devices must have only **one** key per device,
- Operational lockable securement device-sets must be keyed alike and there must be only one key per device-set,
- Cenovus authorized personnel shall be the first to install their lockout device and tag out (LOTO) and the last person to remove their LOTO prior to reinstating back to service.

Securing by complex group control (OHS 215.1) MUST be directed through corporate H&S Management, in order for appropriate parties (respective asset Operations Director and H&S Director, prior to submittal to OH&S Director of Inspection.

#### 5.0 Training and Competency

There are two aspects of competency that must be considered; applicable procedures and training requirements. Each are governed by specific COMS Standards.

##### 5.1 Operating and maintenance procedures

It is the accountability of Functional Leaders to ensure that workers under their supervision have been trained in the appropriate policies, standards, processes, and procedures. This accountability is defined within [4.5 Operating and Maintenance Procedures COMS Standard](#).

##### 5.2 Training & competency

It is expected that all personnel involved work related to the Energy Isolation Standard will have training and the appropriate competency to perform their roles. Cenovus expectations related to training and competency is outlined in [5.4 Training and Competency Management COMS Standard](#).

Formal training on site specific isolation procedures is required for all workers who are required to isolate hazardous energy. The training should include the use, application, and limitations of the various isolation securement devices available within their work area.

## 6.0 Program Compliance

### 6.1 Compliance measurement

Compliance with this Standard shall be assessed through program assessments and internal audits, or other measurement criteria as specified in the [7.2 Assurance COMS Standard](#).

Business functions impacted by this Standard must include compliance and program effectiveness verifications in their business assurance program.

## 7.0 References

### 7.1 Internal references

**Table 2: Internal References**

| Reference Type or File Number (CEN-EHSxxxx) | Reference Title  |
|---|--|
| Policy                                      | <a href="#">Corporate Responsibility Policy</a>                              |
| CEN-EHS243                                  | <a href="#">H&amp;S Definitions and Acronyms Standard</a>                    |
| CEN-EHS13040                                | <a href="#">H&amp;S Document and Management of (MOC) Process</a>             |
| COMS 3.1                                    | <a href="#">3.1 Risk Identification and Assessment COMS Standard</a>         |
| COMS 4.1                                    | <a href="#">4.1 Identification of Risk Mitigation Measures COMS Standard</a> |
| COMS 4.2                                    | <a href="#">4.2 Physical Asset Mgmt Strategies and Plans COMS Standard</a>   |
| COMS 4.3                                    | <a href="#">4.3 Physical Asset Mgmt Work Execution COMS Standard</a>         |
| COMS 4.4                                    | <a href="#">4.4 Capital Project Management COMS Standard</a>                 |
| COMS 4.5                                    | <a href="#">4.5 Operating and Maintenance Procedures COMS Standard</a>       |
| COMS 5.4                                    | <a href="#">5.4 Training and Competency Management COMS Standard</a>         |
| COMS 6.1                                    | <a href="#">6.1 Management of Change COMS Standard</a>                       |

### 7.2 External references

**Table 3: External References**

| Reference Type/ Agency/ Association | Reference Title  |
|-------------------------------------|--|
| Regulatory                          | Alberta OHS Code (2009) – Part 2, Part 15, Part 22 Part 37 |
| Regulatory                          | Alberta OHS Regulation – Part 8                            |
| Regulatory                          | British Columbia OHS Regulation – Part 10                  |



| Reference Type/<br>Agency/ Association | Reference Title                                  |
|--|--|
| ASME                                   | ASME B31.3-2008, <i>Power and Process Piping</i> |
| ANSI/ASME                              | ANSI/ASME B16.48-2005, <i>Steel Line Blanks</i>  |