

Fermilab's Controlled Access - FN000311

1. Controlled Access

1.1 Fermilab's Controlled Access Training




Notes:

1.2 Course information

Information About This Course

Getting started Use the menu on the left and the buttons in the lower right corner to navigate this training course.

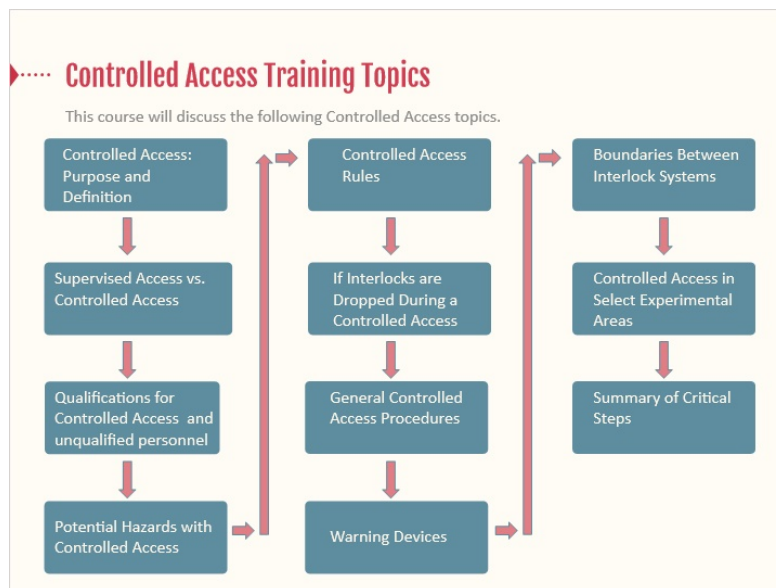
This Training Contains Interactive Pages
Some pages in this training require you to complete all the interactions on the page before you can advance to the next page. These pages will have a  icon in the upper right corner. You will need to complete all the interactions on the page for it to be considered "visited".

All Pages Must Be Visited
The menu will allow you to review the pages in any order you choose. However, all pages in this training must be "visited" in order for you to access the last page which contains the link to the course test. You are required to take and pass the test in order to receive TRAIN credit for this course.

Taking A Break Or Starting Over
If you are not able to complete this training in one sitting, leave the browser open when you leave. If you close the browser, you will have to start over at the beginning.

2. Training Topics

2.1 Controlled Access Training Topics



3. Purpose and Definition

3.1 Purpose and Definition

Controlled Access: Purpose and Definition

Click each icon below to read the definition and purpose of Controlled Access at Fermilab. You must review the information for each icon in order to advance.

Definition Purpose

Notes:

Definition (Slide Layer)

..... **Controlled Access: Purpose and Definition** 

Click each icon below to read the definition and purpose of Controlled Access at Fermilab. You must review the information for each icon in order to advance.

Definition
A controlled access is a *means by which two or more people may safely enter an interlocked enclosure*. A controlled access is typically used instead of a supervised access when it is desired to quickly resume operation after an access. *Because a controlled access does not involve a full radiation survey, configuration control, or searching and securing the enclosure, it minimizes disruption to accelerator operations.*

Purpose (Slide Layer)

..... **Controlled Access: Purpose and Definition** 

Click each icon below to read the definition and purpose of Controlled Access at Fermilab. You must review the information for each icon in order to advance.



 

Purpose
Personnel entering enclosures under controlled access conditions are *subject to increased hazards* due to a reduction in the level of sophistication of several safety measures. Because of this, personnel making controlled accesses *must have additional training* in order to know what safeguards have been reduced and to understand the procedures necessary to ensure their safety.

4. Supervised Access vs. Controlled Access

4.1 Supervised Access vs Controlled Access

▶..... **Supervised Access vs Controlled Access**


 Supervised Access	 Controlled Access
<ul style="list-style-type: none">❖ The enclosure safety system interlocks have been dropped to prevent energizing of exposed electrical bus and particle beams transport.❖ A radiation survey has been completed and documented and appended to the appropriate Radiological Work Permit (RWP).❖ Power supplies for the beamline components that have exposed electrical connections have been locked off.	<ul style="list-style-type: none">❖ The enclosure safety system interlocks are active and monitoring the status of the enclosure.❖ A documented radiation survey has not been performed, so individuals making the controlled access must measure the radiation levels.❖ Power supplies for beamline components that have exposed electrical connections have not been locked off.

5. Qualifications for Controlled Access

5.1 Qualifications page 1


▶..... **Qualifications for Controlled Access**

To ensure that controlled accesses can be conducted safely and reliably, procedures have been implemented. Normally, only Fermilab employees and users ([FESHM 1080](#)) are eligible to make controlled accesses.



Notes:

5.2 Qualifications page 2




Qualifications for Controlled Access

Before issuing *Enter* keys, either directly or via remote key tree, Main Control Room (MCR) personnel will verify by using the key logger or TRAIN database that the entrants have the required training. The qualification requirements are:

- Minimum Training
- LOTO II
- Additional Requirements
- Training Renewal

Click the buttons on the left to see the qualification requirements. All requirements must be reviewed before you can advance in the training.

Minimum training (Slide Layer)



Qualifications for Controlled Access

Before issuing *Enter* keys, either directly or via remote key tree, Main Control Room (MCR) personnel will verify by using the key logger or TRAIN database that the entrants have the required training. The qualification requirements are:

- Minimum Training
- LOTO II
- Additional Requirements
- Training Renewal

At a minimum, prospective entrants must have completed and be up-to-date in the following Fermilab training:

- ❖ Radiological Worker-- Classroom(Virtual) (FN000470/CR)
- ❖ Radiological Worker--Practical Factors (FN000471/OJ)
- ❖ Fermilab Controlled Access (FN000311)

LOTO 2 (Slide Layer)

▶..... **Qualifications for Controlled Access**

Before issuing *Enter* keys, either directly or via remote key tree, Main Control Room (MCR) personnel will verify by using the key logger or TRAIN database that the entrants have the required training. The qualification requirements are:

Entrants may need to be qualified in Lockout/Tagout (LOTO) Level II (FN000212).

- Minimum Training
- LOTO II
- Additional Requirements
- Training Renewal

Additional requirements (Slide Layer)

▶..... **Qualifications for Controlled Access**

Before issuing *Enter* keys, either directly or via remote key tree, Main Control Room (MCR) personnel will verify by using the key logger or TRAIN database that the entrants have the required training. The qualification requirements are:

There may be additional requirements such as Oxygen Deficiency Hazard training (ODH) areas and or area-specific hazard training for some experimental enclosures.

- Minimum Training
- LOTO II
- Additional Requirements
- Training Renewal

training renewal (Slide Layer)

▶..... **Qualifications for Controlled Access**

Before issuing *Enter* keys, either directly or via remote key tree, Main Control Room (MCR) personnel will verify by using the key logger or TRAIN database that the entrants have the required training. The qualification requirements are:

Minimum Training

LOTO II

Additional Requirements

Training Renewal

Fermilab Controlled Access training must be renewed annually.

6. Controlled Access for Unqualified Personnel

6.1 Unqualified Personnel

▶..... **Controlled Access for Unqualified Personnel**

Subcontractor personnel are typically prohibited from becoming controlled access qualified. Unqualified personnel (e.g. subcontractors) may be permitted to make an escorted controlled access if approved by the appropriate Division Safety Officer (DSO) and the Radiation Safety Officer (RSO). The following rules apply:

Safety Briefing

Escort Requirement

Key Requirement

Escort Responsibility

Click the buttons on the left to see the rules that apply. Rules must be reviewed before you can advance in the training.

Safety Briefing (Slide Layer)

▶..... **Controlled Access for Unqualified Personnel**

Subcontractor personnel are typically prohibited from becoming controlled access qualified. Unqualified personnel (e.g. subcontractors) may be permitted to make an escorted controlled access if approved by the appropriate Division Safety Officer (DSO) and the Radiation Safety Officer (RSO). The following rules apply:

The unqualified personnel must receive a safety briefing from the assigned RSO, or designee.

Escort Requirement (Slide Layer)

▶..... **Controlled Access for Unqualified Personnel**

Subcontractor personnel are typically prohibited from becoming controlled access qualified. Unqualified personnel (e.g. subcontractors) may be permitted to make an escorted controlled access if approved by the appropriate Division Safety Officer (DSO) and the Radiation Safety Officer (RSO). The following rules apply:

The unqualified personnel must be escorted during the entire access.

There must be a minimum of one qualified escort for each unqualified person.

Key Requirement (Slide Layer)

▶..... **Controlled Access for Unqualified Personnel**

Subcontractor personnel are typically prohibited from becoming controlled access qualified. Unqualified personnel (e.g. subcontractors) may be permitted to make an escorted controlled access if approved by the appropriate Division Safety Officer (DSO) and the Radiation Safety Officer (RSO). The following rules apply:

The unqualified personnel must have their own Entry key, but they *do not* operate the interlock boxes. Only qualified escorts are allowed to operate the interlock boxes.

Escort Responsibility (Slide Layer)

▶..... **Controlled Access for Unqualified Personnel**

Subcontractor personnel are typically prohibited from becoming controlled access qualified. Unqualified personnel (e.g. subcontractors) may be permitted to make an escorted controlled access if approved by the appropriate Division Safety Officer (DSO) and the Radiation Safety Officer (RSO). The following rules apply:

Escorts are responsible for ensuring that unqualified entrants observe all safety requirements.

The individual or organization on whose behalf the requested access is being made is responsible for providing the necessary escorts.

7. Potential Hazards with Controlled Access

7.1 Potential Hazards page 1

Potential Hazards with Controlled Access

There are potential hazards associated with controlled accesses. Following the correct procedures can minimize or eliminate these hazards.

Click the buttons on the right to see the potential hazards. All hazards must be reviewed before you can advance in the training.

- Direct Beam-On Radiation
- Electrocution
- Residual Radioactivity
- Removable Radioactivity

Direct Beam On (Slide Layer)

Potential Hazards with Controlled Access

There are potential hazards associated with controlled accesses. Following the correct procedures can minimize or eliminate these hazards.

Direct Beam-On Radiation

If a person is in a beam enclosure during beam-on conditions, they may be in immediate danger of receiving a large acute and potentially lethal radiation exposure.

- ❖ When an *Enter* key is removed from the key tree to allow access, the beam is inhibited in a fail-safe manner by several devices.
- ❖ Possession of the correct *Enter* key for the enclosure being accessed is the primary measure, under the personal control of the individual, that directly prevents the return of the accelerated beam during a controlled access.

- Direct Beam-On Radiation
- Electrocution
- Residual Radioactivity
- Removable Radioactivity

electrocution (Slide Layer)

Potential Hazards with Controlled Access

There are potential hazards associated with controlled accesses. Following the correct procedures can minimize or eliminate these hazards.

Electrocution

Fermilab accelerator and beamline enclosures contain various electrical hazards. The interlocked electrical safety system is intended to provide limited protection of entrants from exposed electrical hazards.

- ❖ The electrical safety system permit is inhibited when an *Enter* key for the enclosure is removed from the key tree, which disables power to exposed conductors with hazardous voltages and/or currents.
- ❖ Possession of the correct *Enter key for the enclosure* being accessed is the primary measure, under the personal control of the individual, that directly inhibits the electrical safety system permit during a controlled access.
- ❖ Reliance on the safety system alone does not satisfy Lockout/Tagout (LOTO) requirements. You must make certain that power has been locked off to any component you work on or may come in contact with.

Direct Beam-On Radiation

Electrocution

Residual Radioactivity

Removable Radioactivity

Residual Radioactivity (Slide Layer)

Potential Hazards with Controlled Access

There are potential hazards associated with controlled accesses. Following the correct procedures can minimize or eliminate these hazards.

Residual Radioactivity

After the beam strikes an object, the object becomes radioactive. It only takes a beam loss for a short period of time for high levels of residual radioactivity to be present shortly after the beam is turned off.

- ❖ During a controlled access, you are responsible for the radiation survey in the area where you are working. The log survey meter (LSM) is the only reliable means of determining radiation levels during a controlled access.
- ❖ Individuals making accesses to beam enclosures (during both controlled and supervised accesses) and other posted radiological areas must wear dosimetry specified by the Radiological Work Permit (RWP).

Direct Beam-On Radiation

Electrocution

Residual Radioactivity

Removable Radioactivity

Removeable Radioactivity (Slide Layer)

Potential Hazards with Controlled Access

There are potential hazards associated with controlled accesses. Following the correct procedures can minimize or eliminate these hazards.

Removeable Radioactivity (Surface Contamination)

Small quantities of radioactive material (in the form of dust, metal grindings, etc.) are hazardous if ingested, inhaled, or injected into the body, and can lead to contamination of skin, clothing or other items.

- ❖ You are not permitted to smoke, eat, or drink in any beam enclosures.
- ❖ All posted signs and instructions regarding contaminated areas and protective clothing requirements are to be obeyed. The controlled access RWP will specify the protective clothing requirements for the type of work to be performed, and frisking requirements upon exit.

Direct Beam-On Radiation

Electrocution

Residual Radioactivity

Removeable Radioactivity

7.2 Potential Hazards page 2

Potential Hazards with Controlled Access

The hazards listed below exist in some enclosures, but not all.

Oxygen Deficiency Hazard

Certain areas of the accelerator and extraction beamlines are classified as ODH areas due to the large quantities of inert gases contained in the cryogenic systems. These areas require additional ODH training. ODH procedures are to be followed in these areas at all times.

High Magnetic Fields

During a controlled access, some electromagnets may remain energized with potential exposure of personnel to magnetic fields. Components that, when energized, may produce magnetic field strengths above the action level for individuals with cardiac pacemakers may be found in various locations and are posted "Danger: Magnetic Field Hazard."

Other Hazards

Other hazards may be encountered. See your supervisor or DSO for more information.

8. Controlled Access Rules

8.1 Training

Training

Personnel who violate the rules pertaining to controlled access are subject to disciplinary action. See FRCM Article 111. For employees, this may include revocation of Controlled Access qualification, leave without pay, and possible termination. Non-employees may be denied use of Fermilab facilities.

- Training Will Be Verified**
Training will be verified for each individual prior to making a controlled access.
- Training Must Be Current**
Controlled Access and Radiological Worker training status must be current.
- Other Required Training**
Based upon the location and the nature of the tasks to be performed, other ESH&Q training requirements such as Lockout/Tagout (LOTO) and Oxygen Deficiency Hazard (ODH) and other may be required.

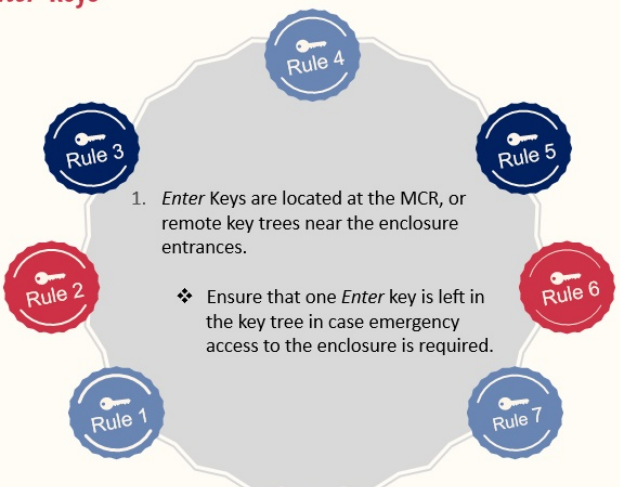
8.2 Enter Keys

Enter Keys

Click the buttons around the circle to view the Controlled Access rules for keys before entering and enclosure.

Key rule 1 (Slide Layer)

▶..... *Enter Keys*

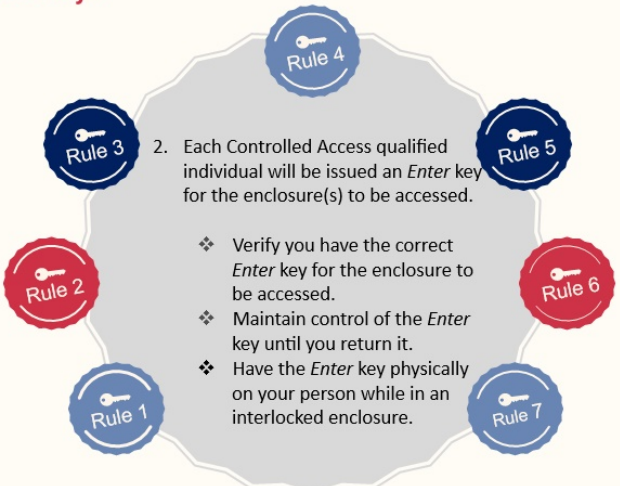


1. *Enter Keys* are located at the MCR, or remote key trees near the enclosure entrances.

- ❖ Ensure that one *Enter* key is left in the key tree in case emergency access to the enclosure is required.

Key rule 2 (Slide Layer)

▶..... *Enter Keys*



2. Each Controlled Access qualified individual will be issued an *Enter* key for the enclosure(s) to be accessed.

- ❖ Verify you have the correct *Enter* key for the enclosure to be accessed.
- ❖ Maintain control of the *Enter* key until you return it.
- ❖ Have the *Enter* key physically on your person while in an interlocked enclosure.

Key rule 3 (Slide Layer)

▶..... *Enter Keys*

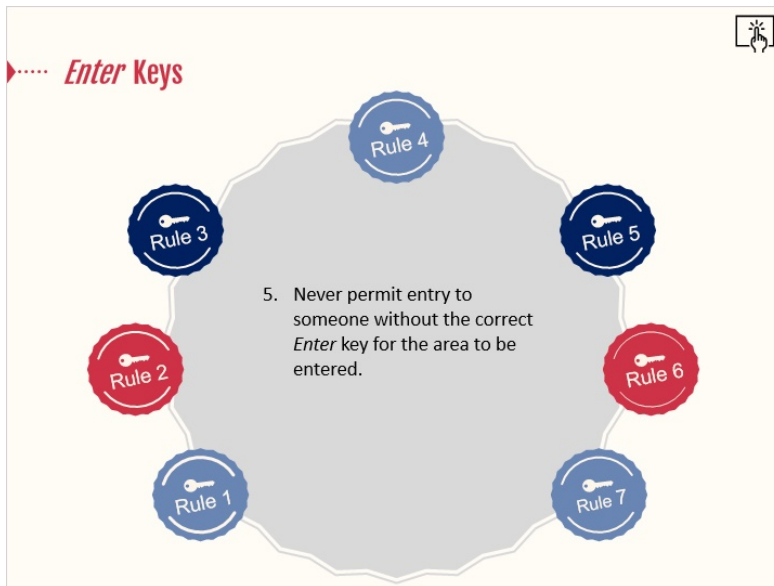
3. Never give your *Enter* key to another individual, even if they are qualified to make controlled accesses. The *Enter* key is assigned to you alone.

Key rule 4 (Slide Layer)

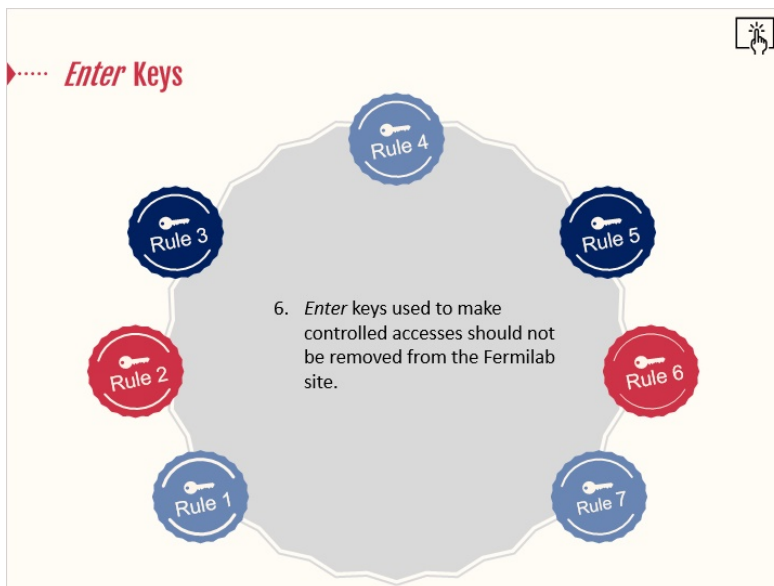
▶..... *Enter Keys*

4. You are responsible for checking that everyone who makes the controlled access with you possesses the correct *Enter* key. Each person entering an interlocked enclosure must physically display his/her *Enter* key to others participating in the access.

Key rule 5 (Slide Layer)



Key rule 6 (Slide Layer)



Key rule 7 (Slide Layer)

▶..... *Enter Keys*

7. Personally return your *Enter* key to the MCR or remote key tree as soon as the controlled access has been completed.

8.3 RWP and Sign-in Sheet


▶..... **RWP and Sign-in Sheet**

Click each icon below. You must review the information for each icon in order to advance.

Read RWP & complete sign-in

If an LSM is required.

Read RWP (Slide Layer)

 **RWP and Sign-in Sheet**

Click each icon below. You must review the information for each icon in order to advance.

Read RWP & complete sign-in


If an LSM is required

Read the Controlled Access Radiological Work Permit (RWP) for the enclosure(s) to be accessed, if an RWP exists, and completely fill out the sign-in-sheet.

- ❖ You must do this each time you obtain an *Enter key*, even if you have made an access earlier in the day.
- ❖ Verify that the *Enter Key* you were issued corresponds with the enclosure you are entering by checking the key barcode number on your *Enter key* against the range specified on the Controlled Access RWP sign-in-sheet. This 4-5 digit barcode number is what the RWP sign in sheet is asking you to write down, not the enclosure sequence number (typically 1-2 digits).

NOTE: RWPs are kept in the same location as the enclosure Enter keys, either in the MCR or next to the remote key trees.

LSM required (Slide Layer)

 **RWP and Sign-in Sheet**

Click each icon below. You must review the information for each icon in order to advance.

Read RWP & complete sign-in

If an LSM is required

If the RWP requires an Log Survey Meter (LSM) for the enclosure to be entered:

- ❖ Obtain an LSM from the MCR or Radiation Safety personnel
- ❖ Perform checks
 - ❖ Battery check
 - ❖ Source check
 - ❖ Look for damage (frayed wire, etc.)
 - ❖ Calibration check
- ❖ Make sure you know how to properly use the instrument

There are several LSMs kept in the MCR.

8.4 MCR Group LOTO Boxes

▶..... **MCR Group LOTO Boxes**

LOTO II May Be Required

Certain enclosures require LOTO II training and have group LOTO lock boxes in the MCR. Enclosures with Group LOTO boxes will be noted on the Controlled Access RWP for those enclosures.

Apply Lock

If the enclosure to be entered has a group LOTO lock box, all the individuals entering that enclosure are required to follow LOTO requirements and place their individual LOTO lock on the appropriate group LOTO lock box.

Notes:

8.5 General and Written LOTO


▶..... **General and Written LOTO**

Perform LOTO on individual components in accordance with Fermilab ES&H Manual Chapter 2100 , Fermilab Energy Control Program (Lockout/Tagout).

Notes:


8.6 Group Check Keys At Entrance

Group Check Keys At The Entrance



Possession of Correct *Enter* Key

- ❖ Possession of the correct *Enter* key is the best way to protect access participants from direct beam-on radiation and electrocution hazards.
- ❖ The *Enter* key is required for entry into enclosures.



***Enter* Keys Must be Displayed Before Entry**


- ❖ In order to ensure that everyone making a controlled access has the correct *Enter* key in their possession, all members of the access party are responsible for physically displaying their *Enter* key to everyone else, and also visually verifying everyone else's *Enter* keys before accessing the enclosure.

8.7 Knowledge Check - Group Access


(Multiple Choice, 10 points, 1 attempt permitted)

Knowledge Check

Which group shown below is ready for a controlled access assuming other entry requirements are met? Choose a group and click "submit".



Group A



Group B

[Submit](#)

Correct	Choice
	Group A
X	Group B

Feedback when correct:


That's right! You selected Group B which has matching Enter keys.

Feedback when incorrect:


Sorry, that is incorrect. The correct answer is Group B. All the Enter keys in Group B match. There is one Enter key in Group A that does not match the others.

Notes:


Incorrect (Slide Layer)

▶ Knowledge Check


Which group shown below is ready for a controlled access assuming other entry requirements are met? Choose a group and click "submit".



Group A



Group B

Incorrect Sorry, that is incorrect. The correct answer is Group B. All the Enter keys in Group B match. There is one Enter key in Group A that does not match the others.

[Continue](#)

[Submit](#)

Correct (Slide Layer)

Knowledge Check

Which group shown below is ready for a controlled access assuming other entry requirements are met? Choose a group and click "submit".

Correct That's right! You selected Group B which has matching Enter keys. **Continue**

Group A Group B

Submit

8.8 Two-Person Rule


Two-Person Rule

All Controlled and Supervised Accesses are considered a hazardous work activity that requires application of the two-person rule, even if the entry will be brief and only in the immediate area beyond the gate. At least two people are required to enter the enclosure for a proper controlled access. For supervised accesses, personnel may pass through the door/gate alone only if they are joining a work group already in the enclosure. You should never be in an enclosure alone.


Notes:


8.9 Personal Protective Equipment (PPE)

▶..... **Personal Protective Equipment (PPE)**


 **All Persons Shall Wear Personal Protective Equipment (PPE)**
All persons making a controlled access shall wear the personal protective equipment (PPE) specified in the applicable RWP.

.....

 **Less Restrictive Requirements May Be Requested**
A job-specific RWP with less restrictive PPE requirements may be requested through the assigned RSO. Requirements for work in the remainder of the enclosure would be dictated by the general controlled access RWP.



8.10 LSM Use

▶..... **LSM Use** 

You are responsible for surveying your work area for radiological conditions. Use an LSM to check radiation levels in the area where you are working, by holding the flat portion of the LSM probe parallel to the element at a distance of one foot. While inside, groups may split into smaller working groups as long as each working group has their own LSM.

[Calibration Sticker](#)

[Look For Damage](#)

[Battery Check](#)

[Source Check](#)

Click the buttons on the left to learn about the items you should inspect when you obtain an LSM. All buttons must be reviewed before you can advance in the training.

Calibration Sticker (Slide Layer)

▶..... **LSM Use**


You are responsible for surveying your work area for radiological conditions. Use an LSM to check radiation levels in the area where you are working, by holding the flat portion of the LSM probe parallel to the element at a distance of one foot. While inside, groups may split into smaller working groups as long as each working group has their own LSM.

Calibration Sticker

Look For Damage

Battery Check

Source Check



The image shows a person's hands holding a grey and black LSM (Lead Scintillation Monitor) device on a light-colored wooden table. The device has a flat rectangular probe on top and a handle on the side. The person is wearing a dark, long-sleeved shirt. The device is positioned horizontally on the table.

Look for Damage (Slide Layer)

▶..... **LSM Use**


You are responsible for surveying your work area for radiological conditions. Use an LSM to check radiation levels in the area where you are working, by holding the flat portion of the LSM probe parallel to the element at a distance of one foot. While inside, groups may split into smaller working groups as long as each working group has their own LSM.

Calibration Sticker

Look For Damage

Battery Check

Source Check



The image shows a person's hands holding an LSM (Lead Scintillation Monitor) device on a light-colored wooden table. The device is held vertically, with the flat rectangular probe pointing upwards. The person is wearing a dark, long-sleeved shirt. The device has a handle on the side and a small display or indicator on the front. The number '58' is visible on the front of the device.

Battery Check (Slide Layer)

▶..... **LSM Use**


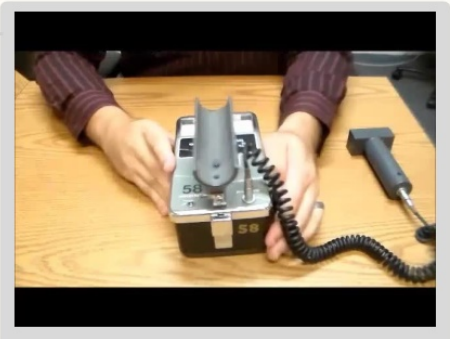
You are responsible for surveying your work area for radiological conditions. Use an LSM to check radiation levels in the area where you are working, by holding the flat portion of the LSM probe parallel to the element at a distance of one foot. While inside, groups may split into smaller working groups as long as each working group has their own LSM.

Calibration Sticker

Look For Damage

Battery Check

Source Check



Source Check (Slide Layer)

▶..... **LSM Use**



You are responsible for surveying your work area for radiological conditions. Use an LSM to check radiation levels in the area where you are working, by holding the flat portion of the LSM probe parallel to the element at a distance of one foot. While inside, groups may split into smaller working groups as long as each working group has their own LSM.

Calibration Sticker

Look For Damage

Battery Check

Source Check



8.11 Radiological Conditions Communications

▶..... Radiological Conditions Communications



Dose rates > 100mR/hr


If dose rates exceed 100 mR/hr at one foot in your work area, leave the area and inform the Crew Chief and the assigned Radiation Safety Officer (RSO) via the Main Control Room (MCR). You must receive permission from the assigned RSO or designee prior to beginning work.



Unexpected dose rates > 500mR/hr

If you unexpectedly encounter dose rates that exceed 500 mR/hr at one foot, immediately leave the enclosure, check closely for contamination, and inform the Crew Chief and the assigned Radiation Safety Officer (RSO) via the Main Control Room (MCR). The Crew Chief and assigned RSO will determine subsequent action.

8.12 Response to Deviations

▶..... Response to Deviations 

If you should discover that you or another person does not have possession of the correct *Enter* key for the enclosure, or you have otherwise departed from the controlled access procedures in a manner that could lead to a safety concern:

Click the buttons on the right review the proper responses to deviations. All must be reviewed before you can advance in the training.

[Exit the Enclosure](#)

[Call the MCR](#)

[Search and Secure](#)

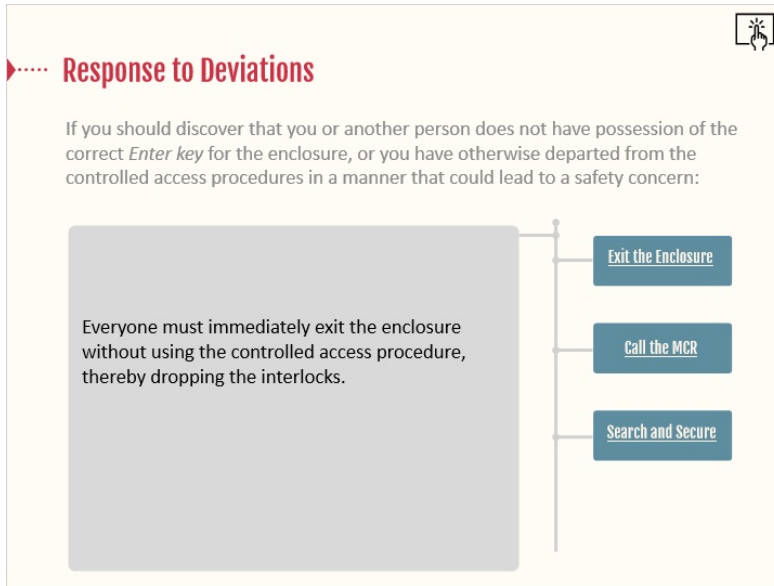
Exit the Enclosure (Slide Layer)

▶..... **Response to Deviations**

If you should discover that you or another person does not have possession of the correct *Enter key* for the enclosure, or you have otherwise departed from the controlled access procedures in a manner that could lead to a safety concern:

Everyone must immediately exit the enclosure without using the controlled access procedure, thereby dropping the interlocks.

- Exit the Enclosure
- Call the MCR
- Search and Secure



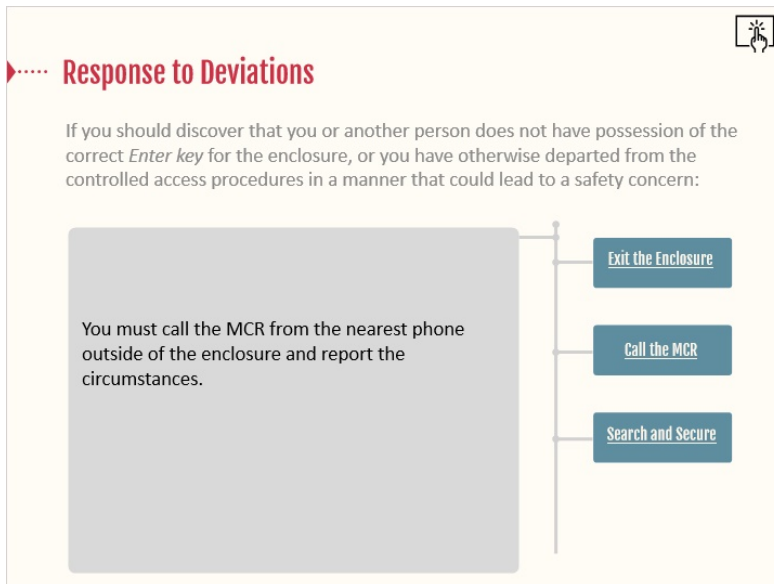
Call the MCR (Slide Layer)

▶..... **Response to Deviations**

If you should discover that you or another person does not have possession of the correct *Enter key* for the enclosure, or you have otherwise departed from the controlled access procedures in a manner that could lead to a safety concern:

You must call the MCR from the nearest phone outside of the enclosure and report the circumstances.

- Exit the Enclosure
- Call the MCR
- Search and Secure



Search and secure (Slide Layer)

▶..... **Response to Deviations**

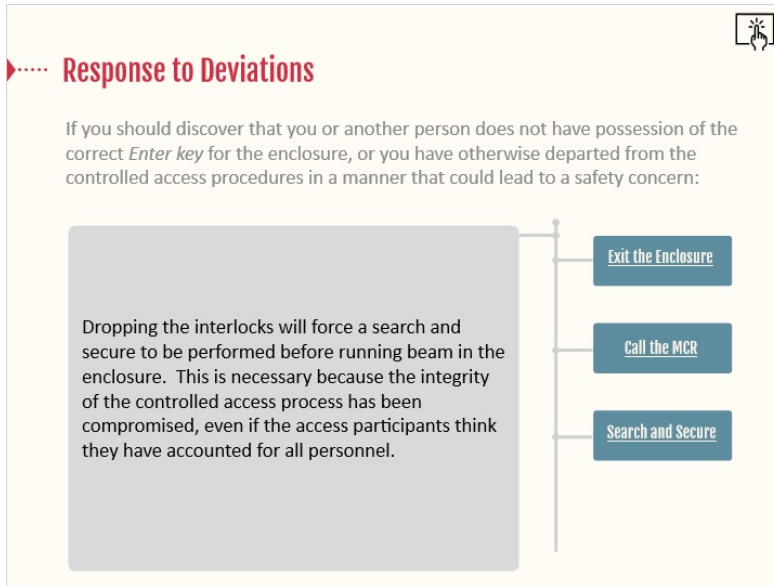
If you should discover that you or another person does not have possession of the correct *Enter key* for the enclosure, or you have otherwise departed from the controlled access procedures in a manner that could lead to a safety concern:

Dropping the interlocks will force a search and secure to be performed before running beam in the enclosure. This is necessary because the integrity of the controlled access process has been compromised, even if the access participants think they have accounted for all personnel.

[Exit the Enclosure](#)

[Call the MCR](#)

[Search and Secure](#)



Video button (Slide Layer)

▶..... **Response to Deviations**

If you should discover that you or another person does not have possession of the correct *Enter key* for the enclosure, or you have otherwise departed from the controlled access procedures in a manner that could lead to a safety concern:

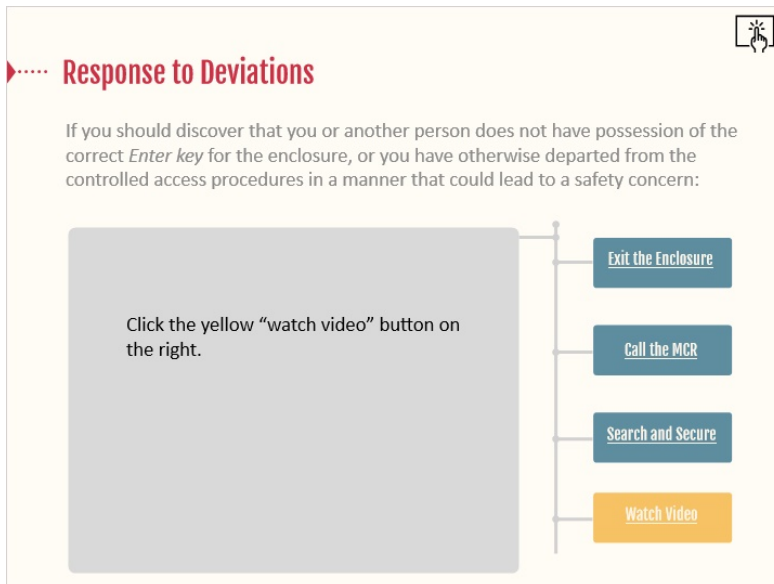
Click the yellow "watch video" button on the right.

[Exit the Enclosure](#)

[Call the MCR](#)

[Search and Secure](#)


[Watch Video](#)



Video (Slide Layer)

▶..... **Response to Deviations**

If you should discover that you or another person does not have possession of the correct *Enter key* for the enclosure, or you have otherwise departed from the controlled access procedures in a manner that could lead to a safety concern:



[Exit the Enclosure](#)

[Call the MCR](#)

[Search and Secure](#)

[Watch Video](#)

9. If Interlocks are dropped during a Controlled Access

9.1 If Interlocks are Dropped

▶..... **If Interlocks are Dropped During a Controlled Access**

If the safety system interlocks are inadvertently broken during a controlled access, the Crew Chief must choose between one of the following options. Click each button below to review each option.

[Transition to Supervised Access](#)

[Re-secure the Enclosure](#)

Transition to Supervised Access (Slide Layer)

 **..... If Interlocks are Dropped During a Controlled Access**

If the safety system interlocks are inadvertently broken during a controlled access, the Crew Chief must choose between one of the following options. Click each button below to review each option.

Option 1 - Make the transition to supervised access

- ❖ Entrants must leave the enclosure and sign the Supervised Access RWP after the radiation survey maps have been appended to it.

Re-secure the Enclosure (Slide Layer)

 **..... If Interlocks are Dropped During a Controlled Access**

If the safety system interlocks are inadvertently broken during a controlled access, the Crew Chief must choose between one of the following options. Click each button below to review each option.

Option 2 - Re-secure the enclosure.

- ❖ Immediately re-secure
 - Entrants must vacate the enclosure while operators secure the enclosure.
- ❖ Wait until the access has been concluded.
 - Entrants must continue to follow controlled access rules.

Interlock photo (Slide Layer)

▶..... **If Interlocks are Dropped During a Controlled Access**

If the safety system interlocks are inadvertently broken during a controlled access, the Crew Chief must choose between one of the following options. Click each button below to review each option.

Transition to Supervised Access

Re-secure the Enclosure



The photograph shows a metal safety enclosure with a control panel on the left and a status display on the right. The control panel has a yellow 'RESET' button and a digital display showing the number '3'. The status display is labeled 'SAFETY SYSTEM' and 'ENCLOSURE INTERLOCKED'. Below this, it says 'ENCLOSURE STATUS' and has two buttons labeled 'M18-2 ENTER' and 'KEY'.

10. General Controlled Access Procedures

10.1 Pre-Planning

▶..... **Controlled Access – Pre-Planning**

Plan Your Activity

You should carefully plan your activity (i.e., who you are working with, what equipment you need, training & dosimetry requirements, etc.) Determine where you will be working, what entrance to use in order to reach that location, and what enclosure *Enter* key(s) you will need to obtain.

Review The Hazards

Review the hazards associated with your job and complete a written Hazard Analysis if required.

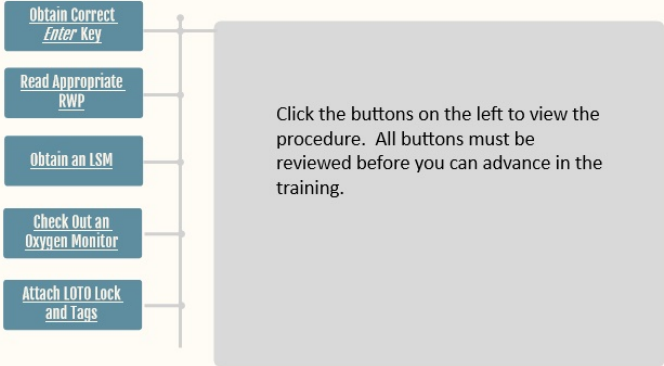
Determine LOTO Requirements

Determine any specific LOTO requirements.

Notes:

10.2 Main Control Room or Remote Key Tree

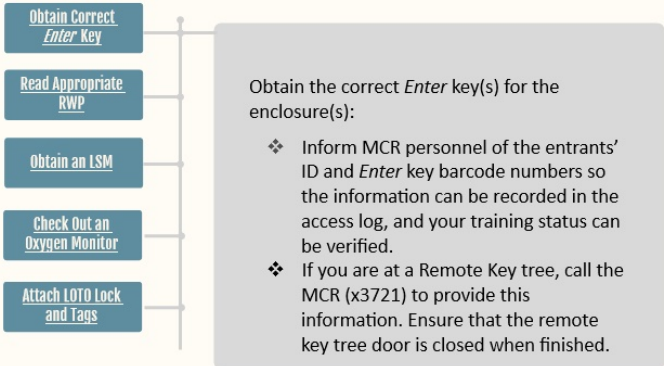
▶ Main Control Room or Remote Key Tree



Click the buttons on the left to view the procedure. All buttons must be reviewed before you can advance in the training.

Obtain correct key (Slide Layer)

▶ Main Control Room or Remote Key Tree



Obtain the correct *Enter* key(s) for the enclosure(s):

- ❖ Inform MCR personnel of the entrants' ID and *Enter* key barcode numbers so the information can be recorded in the access log, and your training status can be verified.
- ❖ If you are at a Remote Key tree, call the MCR (x3721) to provide this information. Ensure that the remote key tree door is closed when finished.

Read appropriate RWP (Slide Layer)

▶..... Main Control Room or Remote Key Tree

The diagram features a vertical sequence of five blue rectangular boxes on the left, each containing a step: 'Obtain Correct Enter Key', 'Read Appropriate RWP', 'Obtain an LSM', 'Check Out an Oxygen Monitor', and 'Attach LOTO Lock and Tags'. A vertical line connects these boxes to a larger grey rectangular box on the right.

Read the appropriate RWP(s) and fill out the sign-in sheets completely.

- ❖ Verify that the *Enter key* you were issued corresponds with the enclosure you are entering by checking the key barcode number on your *Enter key*
- ❖ Ensure you have all requirements specified – dosimetry, instruments, PPE, training, etc.

Obtain an LSM (Slide Layer)

▶..... Main Control Room or Remote Key Tree

The diagram features a vertical sequence of five blue rectangular boxes on the left, each containing a step: 'Obtain Correct Enter Key', 'Read Appropriate RWP', 'Obtain an LSM', 'Check Out an Oxygen Monitor', and 'Attach LOTO Lock and Tags'. A vertical line connects these boxes to a larger grey rectangular box on the right.

Obtain an LSM, if applicable, and perform the required functional tests.

Check out oxygen montior (Slide Layer)

▶..... Main Control Room or Remote Key Tree

Obtain Correct
Enter Key

Read Appropriate
RWP

Obtain an LSM

Check Out an
Oxygen Monitor

Attach LOTO Lock
and Tags

If required, sign out and check a personal oxygen monitor and obtain and inspect an escape pack.

Attach LOTO Locks (Slide Layer)

▶..... Main Control Room or Remote Key Tree

Obtain Correct
Enter Key

Read Appropriate
RWP

Obtain an LSM

Check Out an
Oxygen Monitor

Attach LOTO Lock
and Tags

If you will be entering an enclosure that requires LOTO II training and has a Group Lock box, you should attach LOTO locks and tags to the appropriate group lock box(es).

10.3 Controlled Access Entrance

Controlled Access Entrance

Once at the enclosure entrance:

Click the buttons on the right review the procedure for making a controlled access entrance. You must review each step before you can advance in the training.

- Don Protective Clothing
- Check Interlock Status
- Display Keys
- Clear Communication

Don Protective Clothing (Slide Layer)

Controlled Access Entrance

Once at the enclosure entrance:

Don the protective clothing specified in the RWP for the type of activity you are going to perform.

- Don Protective Clothing
- Check Interlock Status
- Display Keys
- Clear Communication

Check Interlock Status (Slide Layer)

Controlled Access Entrance

Once at the enclosure entrance:

Check the status of the interlocks on the panel next to the gate.

- Don Protective Clothing
- Check Interlock Status
- Display Keys
- Clear Communication

Display Keys (Slide Layer)

Controlled Access Entrance

Once at the enclosure entrance:

The members of the access party must physically display their keys to each other. Your *Enter* key is your protection. Verify that you and everyone on the controlled access has the correct enclosure *Enter* key before entering the enclosure.

- Don Protective Clothing
- Check Interlock Status
- Display Keys
- Clear Communication

Clear Communication (Slide Layer)

▶..... **Controlled Access Entrance**

Once at the enclosure entrance:

Clear communication is essential for successful controlled accesses.

- Don Protective Clothing
- Check Interlock Status
- Display Keys
- Clear Communication

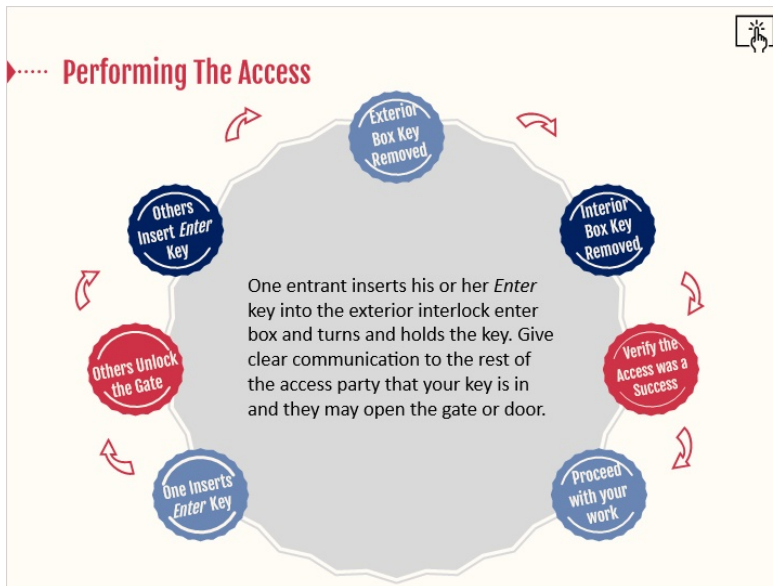
10.4 Performing The Access

▶..... **Performing The Access**

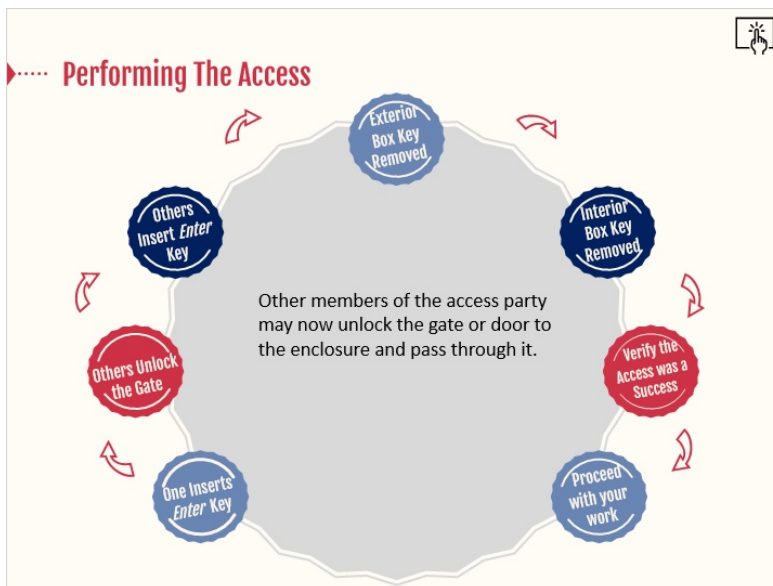
Click the buttons on the end of the shape to view the Controlled Access rules for performing the access. Start with the lower left circle "One Inserts Enter Key".

- Others Insert Enter Key
- Others Unlock the Gate
- One Inserts Enter Key
- Exterior Box Key Removed
- Interior Box Key Removed
- Proceed with your work
- Verify the Access was a Success

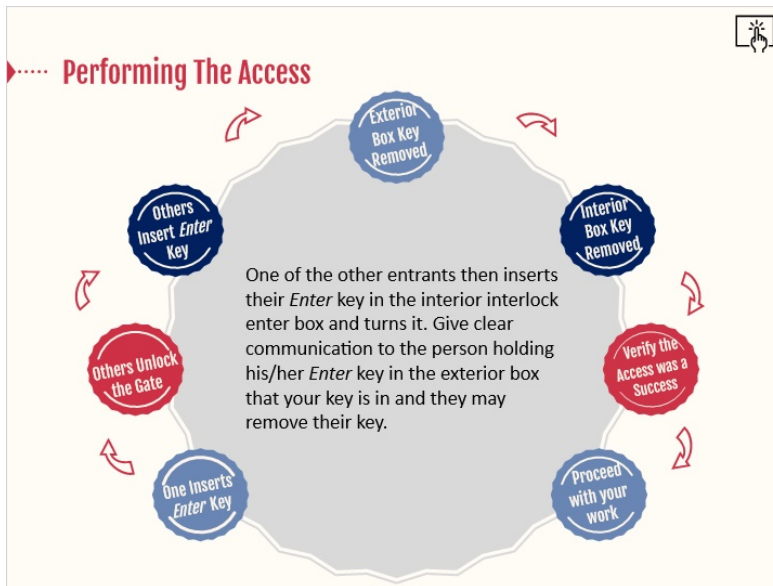
One Inserts Enter Key (Slide Layer)



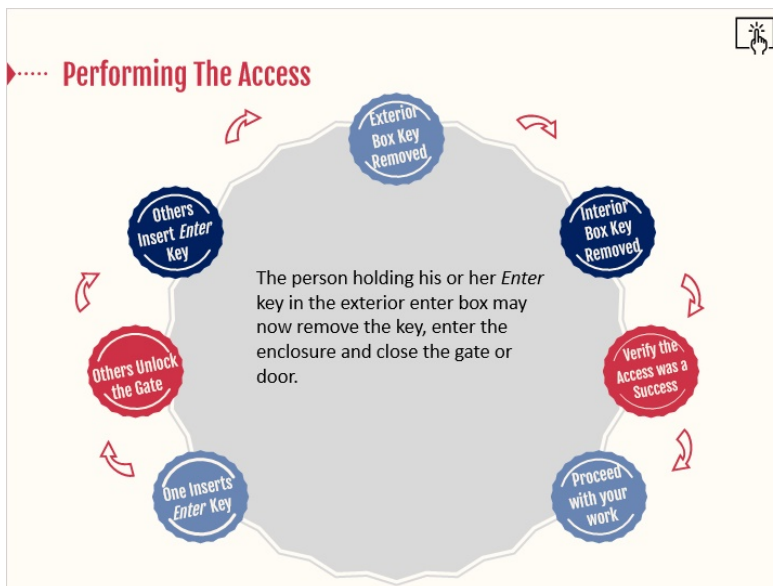
Others Unlock the Gate (Slide Layer)



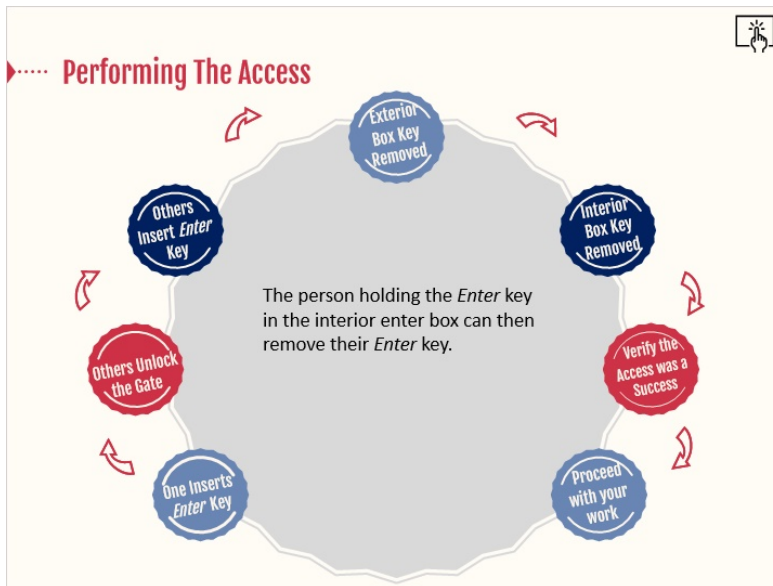
Others Insert Enter Key (Slide Layer)



Exterior Box Key Removed (Slide Layer)



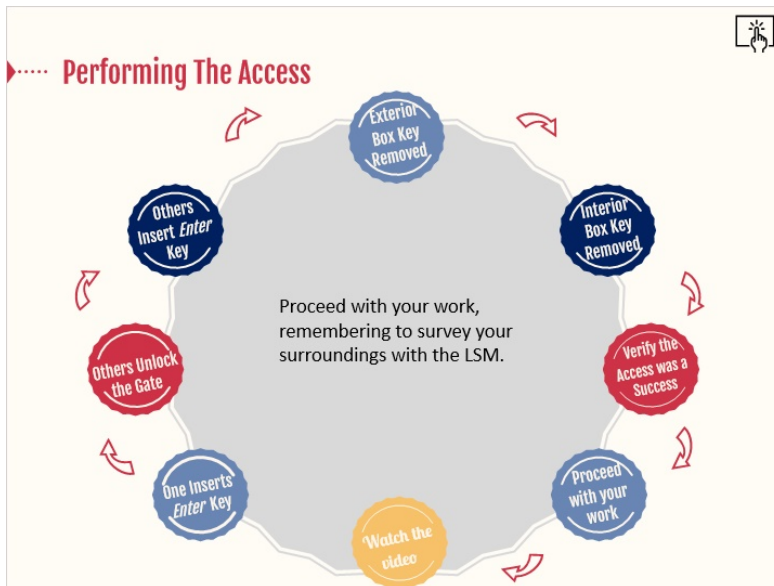
Interior Box Key Remove (Slide Layer)



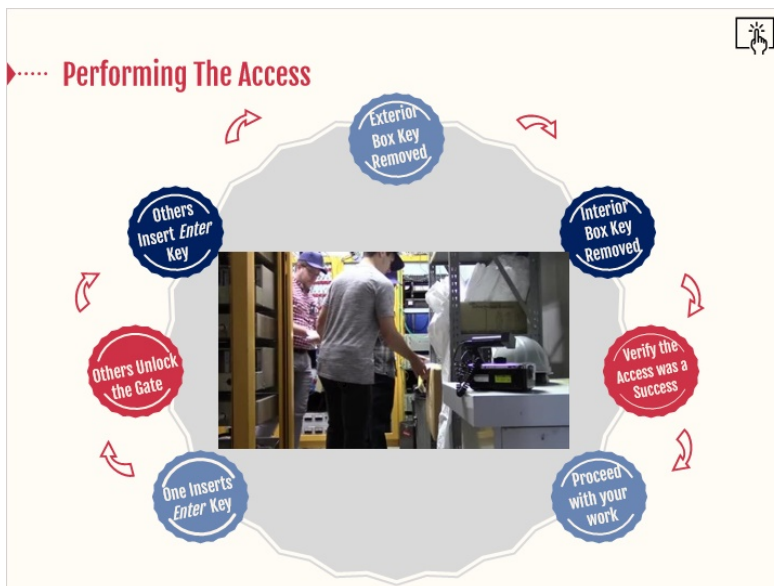
Verify the Access was a success (Slide Layer)



Proceed with your work (Slide Layer)



video (Slide Layer)



10.5 End of Access

▶ End of Access



Exit enclosure by reversing the enter procedure. Return *Enter* key(s) and other items to the MCR or remote key tree. Remove any LOTO locks you placed on the group lock boxes in the MCR.

Notes:





11. Warning Devices

11.1 Warning Devices

Warning Devices

If you find yourself in an enclosure during a controlled access and hear a loud whooping sound or verbal warning message, you must always treat these audible warnings as real and follow the instructions presented in this training.

The warning sound can be generated as a result of several scenarios:

			
Electrical Permit An electrical permit is about to be issued.	Search And Secure A search and secure of an adjacent enclosure is taking place.	Interlocks Interlocks are being tested.	Oxygen Levels Oxygen levels have dropped below 19.5 %.




Click each icon above to hear the warning sound associated with it.

Notes:

11.2 Warning Devices - Response

Warning Devices - Response



If you hear a warning sound or message, take immediate action:

- **Pull The Crash Cord Or Push Crash Button**
Pull the crash cord or push the crash button, if they are available in your area. This will drop the interlocks for that area, preventing beam from being transported to the enclosure. Then hurry to the nearest exit and open the door or gate without using the controlled access procedure. Then exit the enclosure.
- **Go To Nearest Exit**
If there are no crash cords or buttons in the area you are in, go immediately to the nearest exit and open the door or gate without using the controlled access procedure.
- **Do Not Stop At A Telephone In The Enclosure**
Do not stop at a telephone in the enclosure to call and report the warning. Leave the enclosure immediately and call the MCR from a telephone outside the enclosure to report what happened.

12. Boundaries Between Interlocks

12.1 Boundaries Between Interlock Systems page 1

Boundaries Between Interlock Systems

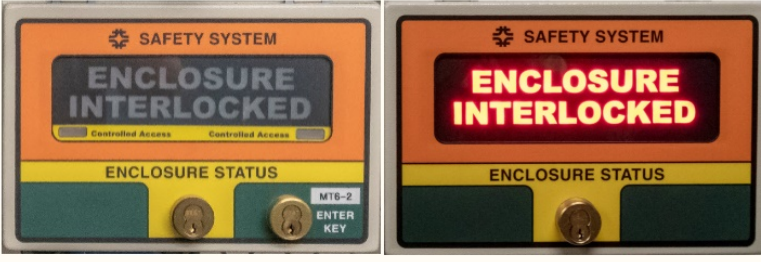
- **Locations Where Enclosures Meet**
At locations where two enclosures meet, all controlled access participants must have two different *Enter* keys; one for the enclosure you are leaving and one for the enclosure you are entering.
- **Gates Separating Two Enclosures**
At the gates separating the two enclosures, you must use the *Enter* key for the enclosure you are going into in the first interlock box, and the *Enter* key for the enclosure you are leaving in the second interlock box. Depending on the direction you are going, you may or may not need an *Enter* key to unlock the gate itself.

12.2 Boundaries Between Interlock Systems page 2

▶..... **Boundaries Between Interlock Systems**


Must Check Status Of the Interlock Boxes

At every door or gate that you are passing through you must first check the status of the interlock boxes on both sides of the gate or door. If the "Enclosure Interlocked" message is flashing, you must use your *Enter* keys in the interlock boxes to pass through using the general controlled access procedure. If the messages are not flashing and the interlock boxes are dark, you do not need to use your *Enter* key in either interlock box to pass through, you may just open the door or gate.



12.3 Boundaries Between Interlock Systems page 3

▶..... **Boundaries Between Interlock Systems**

 **Separate Interlock Enclosures**


The Main Injector tunnel is divided into two separate interlocked enclosures: MI-10 and MI-20—MI-62. The MI-20—MI-62 interlocked enclosure is further divided into multiple sectors, separated by gates. The Tevatron tunnel is divided into two separate interlocked enclosures and one non-interlocked enclosure: F Sector and Transfer Hall are interlocked, and TeV A-E is not interlocked.

.....

13. Select Experimental Areas


13.1 Select Experimental Areas

Select Experimental Areas




PPE Requirements

At specific experimental areas, the controlled access RWPs have less restrictive PPE, dosimetry, instrumentation, and survey requirements because the enclosures are posted as Radioactive Material Areas & Controlled Areas.



RWP Requirements

All entrants must read and follow all stated requirements of the applicable RWP(s), have the correct *Enter* key, and follow the general controlled access procedures.



FTFB

When a controlled access is desired at FTBF, experimenters must contact the Controlled Access Leader (CAL), who will then call the MCR to identify the experimental hall to be accessed and report the names and ID numbers of the individuals making the access.

After the access, return *Enter* keys to the CAL, who will call the MCR to have the key tree door released, report which keys are being returned, place keys back in the key tree, and close the key tree door.

Notes:

14. Critical Steps

14.1 Critical Step Summary

▶..... Critical Step Summary

Click the buttons on each side of this box to review the critical steps of controlled access. You must review each step before you can advance in the training.

Obtain Key

Read RWP

LOTO

Dosimetry

Verify

Survey

Warning

Wrong Key

Obtain Key (Slide Layer)

▶..... Critical Step Summary

Obtain or call for enclosure *Enter* key(s) from the MCR (ext. 3721). Verify that you have been issued the correct *Enter* key(s) for the enclosure(s) being entered.

- ❖ Your key is your protection. It is the best protection that a person on a controlled access has to mitigate direct beam-on radiation and electrocution hazards found in the enclosures.
- ❖ Maintain possession of your *Enter* key – don't give it to anyone else.

Obtain Key

Read RWP

LOTO

Dosimetry

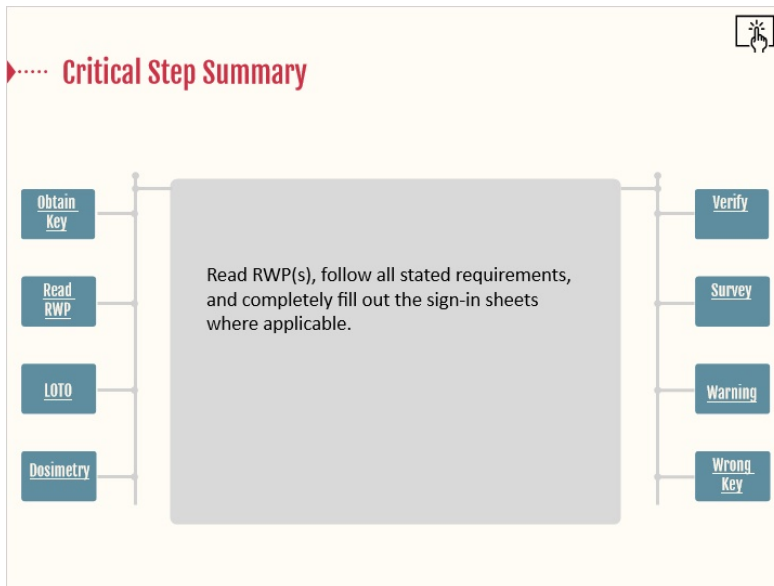
Verify

Survey

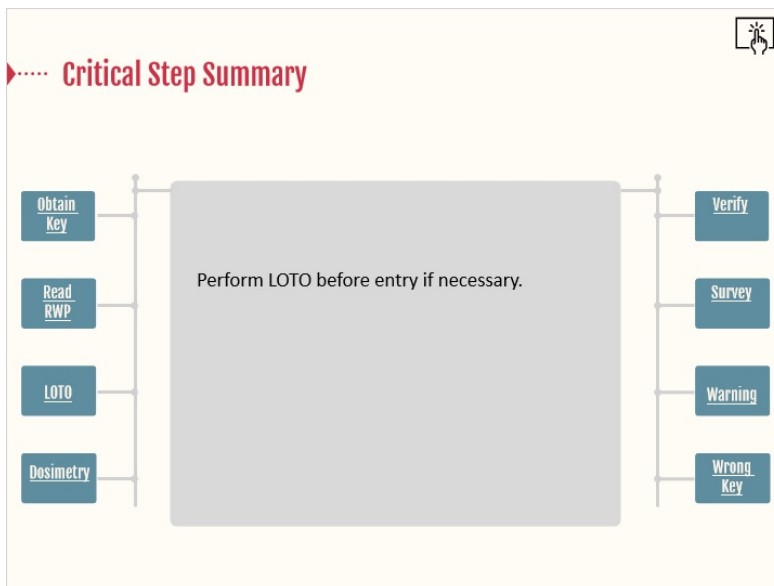
Warning

Wrong Key

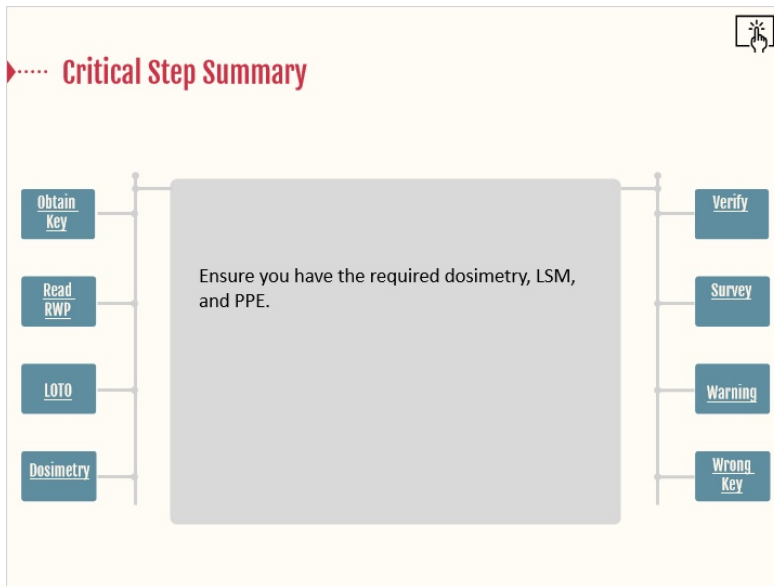
Read RWP (Slide Layer)



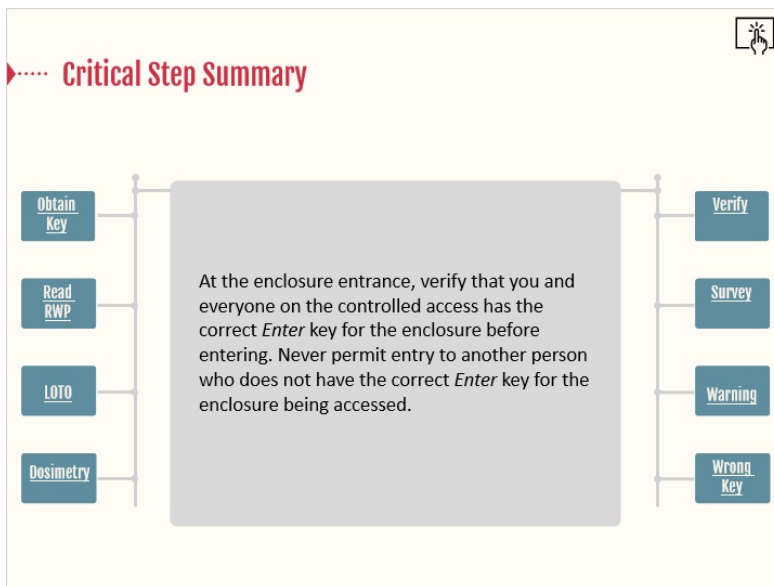
Perform LOTO (Slide Layer)



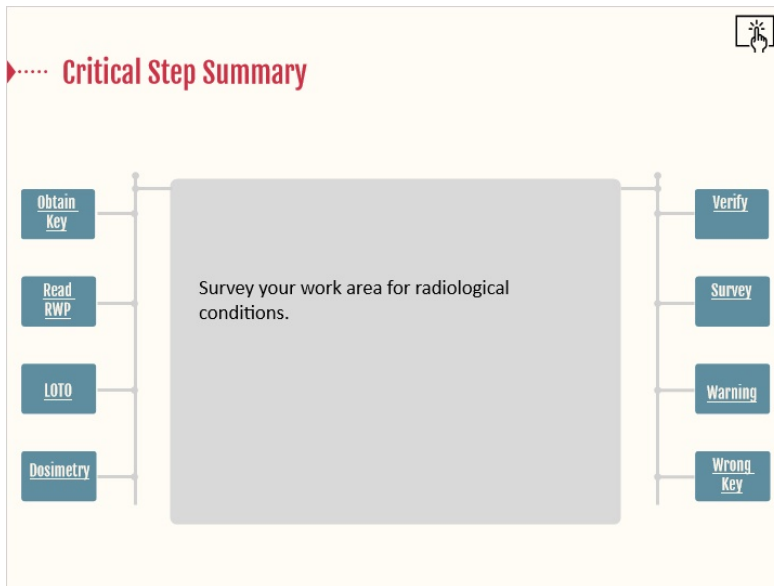
Dosimetry (Slide Layer)



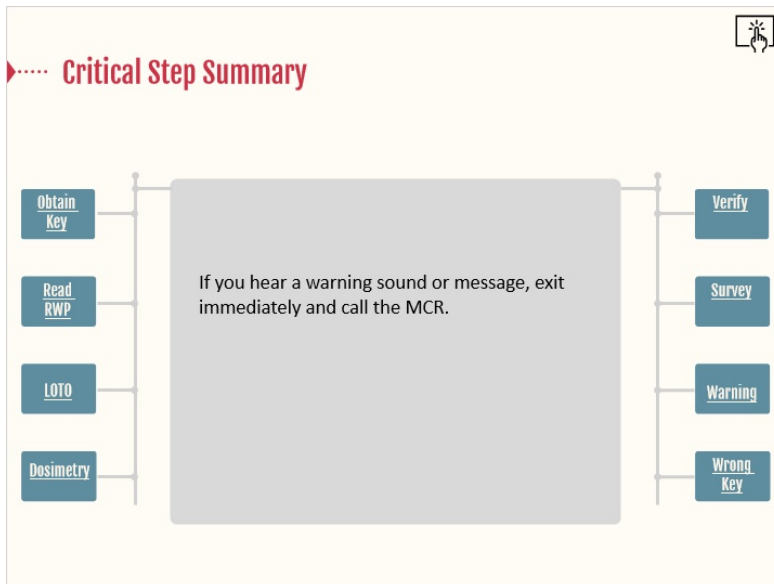
Verify (Slide Layer)



Survey (Slide Layer)



Warning (Slide Layer)



Wrong Key (Slide Layer)

