



**FREEPORT-
McMORAN**

STUDENT GUIDE



SFT FCX1015C WORKPLACE EXAMINATIONS

AUGUST / 2018
VERSION 1.1

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*“We start with looking after
our workers’ welfare.”*

Richard C. Adkerson
President and CEO, Freeport-McMoRan¹

¹ Richard C. Adkerson, “Richard Adkerson CEO Freeport-McMoRan Copper & Gold.” *Youtube.com*, May 4 2011, Accessed July 2, 2015. <https://www.youtube.com/watch?v=j61aFypdvgE>

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LEARNING OBJECTIVES

Learning objectives have been identified and provided to the students to establish guidance and focus throughout the course.

MODULE 1: WORKPLACE EXAMINATION COMPLIANCE

Upon completion of Module 1, the students will be able to:

- Explain the purpose of workplace examinations.
- Describe the qualifications and training necessary to conduct one.

MODULE 2: GENERAL HAZARD IDENTIFICATION

Upon completion of Module 2, the students will be able to:

- Conduct a workplace examination by assessing a scenario for general hazards.

WORKPLACE EXAMINATIONS INTRODUCTION

Mining is a dynamic industry where things, such as environment, equipment, personnel, and work areas, often change. It is critical that each employee is alert and aware of any hazard that may affect his/her safety, or the safety of others. Safe Production is the ultimate goal. The first step in reinforcing this awareness begins with the employee. Through appropriate training, the employee can build the skills necessary to identify, avoid, and mitigate hazards.



Fig. 1 Remain aware of hazards in any workplace

A workplace examination is also referred to as an area inspection, pre-shift inspection, and workplace inspection. These procedures or processes are created by each site to identify and immediately control any hazards prior to beginning and throughout the shift. Make sure that the workplace is adequate for you to perform your regular job duties. Workplace examinations are the first line of defense in protecting our most valuable asset – you.

The backbone of an effective workplace examination is hazard recognition. Hazards generally fall under one of three categories:

- Chemical (e.g., H₂S, lime, solvents)
- Biological (e.g., bacteria, animal waste, venom)
- Physical (e.g., noise, radiation, impact injuries)

Depending on your work area, the hazards to which you are exposed can fall under one or all three of these categories. Being skilled at recognizing hazards associated with your work area is a lifelong pursuit.

Never assume that you are automatically aware of all hazards around you. Changing environmental conditions can affect existing workplace hazards. Temperature changes, noise levels, illumination, and weather conditions are all environmental factors that can greatly alter your work area and, in turn, the associated hazards.

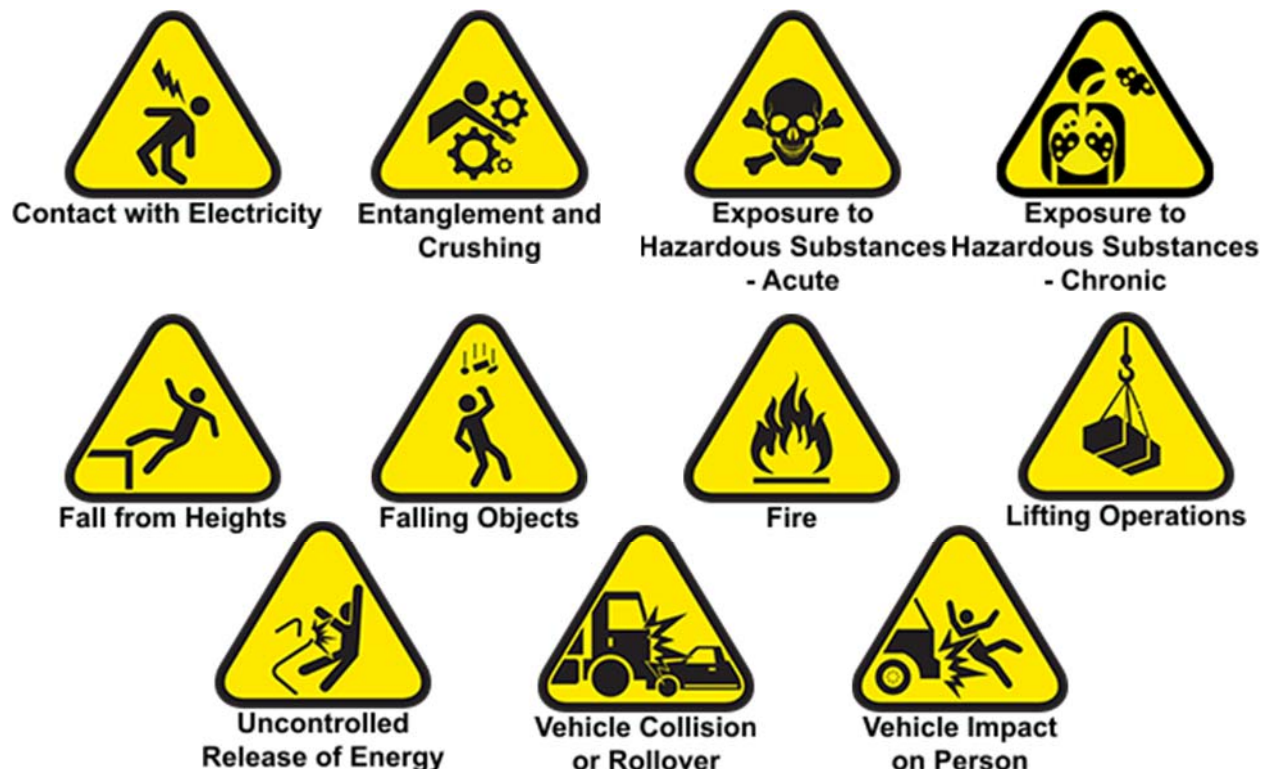
FATAL RISKS AND CRITICAL CONTROLS

Fatal Risk Management is a continuation of the Fatality Prevention Program. Focus is placed on identifying Fatal Risks and Critical Controls in an attempt to standardize how we communicate and control risks to safeguard all employees within the Company. The Fatal Risk Management Program standardizes Fatal Risk communication by implementing Fatal Risk icons, standard definitions, Critical Controls, and Verification Questions for twenty-three Fatal Risks.

Fatal Risks are based on industry data, where specific risk exposure has resulted in catastrophic events such as severe injury or death. While all risks have a degree of danger, Fatal Risks are those risks that, when left uncontrolled, will kill you. After identifying a Fatal Risk, Critical Control(s) are implemented and verified with standard verification questions, to prevent death as a result of the exposure to the Fatal Risk. In the event of an absent or failure of a Critical Control, the job must be stopped as it significantly increases the risk of severe injury or death despite the existence of other controls. In short, Critical Controls help keep you from being killed. The Fatal Risk(s) and Critical Controls relevant to this course are provided below.

FATAL RISKS PRESENT AT ALL SITES

This section includes the Fatal Risks that are present at all sites. Employees should be aware of these in their surroundings and confirm that the relevant Critical Controls are in place.



FATAL RISKS PRESENT AT MANY SITES

The Fatal Risks in this section are found at many sites. Identifying the Critical Controls for each Risk is essential to your safety.



Blasting



Confined Space



Drowning



Ground Failure



Rail Collision



**Rail Impact
on Person**

FATAL RISKS PRESENT AT FEW SITES

Although the Fatal Risks in this section are present at only a few sites, employees must still be aware of their presence, if applicable, and confirm that the appropriate Critical Controls are in place for each.



Aircraft Operation



**Contact with
Molten Material**



Personnel Hoisting



**Underground
Hazardous Atmosphere**



Underground Inrush



**Underground
Rock Fall**

Remember, Fatal Risk Management assists in:

- Identifying the risks that will kill you
- Implementing the controls that will keep you safe
- Verifying that Critical Controls are in place
- Empowering you to stop the job if the Critical Controls are missing or not implemented correctly

It is equally important to evaluate the functionality of the Critical Controls during a workplace examination. If you find during a workplace examination that any of the relevant Critical Controls are not in place, you must immediately stop the job and inform your supervisor or a Health and Safety representative. Continuing with inadequate or non-functioning Critical Controls puts you at greater risk of severe injury or death.

Workplace Examination Compliance



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MODULE 1 LEARNING OBJECTIVES

Upon completion of Module 1, the students will be able to:

- Explain the purpose of workplace examinations
- Describe the qualifications and training level necessary to conduct one

INTRODUCTION

Policies, guidelines, and procedures are typically created as a result of an incident or near miss. Injury or loss of life is often the driving force behind the establishment of the Health and Safety rules under which we work. Performing a job in a safe manner is not only a matter of compliance to regulations, but is your means of returning home safely.

PURPOSE OF WORKPLACE EXAMINATION

The purpose of a workplace examination is to bring the employees' attention to hazards in their working area and take immediate action to mitigate or eliminate them. The workplace examination is the first resource available to you to help promote a safer working area. Use this tool to your advantage and keep safety a priority in your actions.

RESPONSIBLE INDIVIDUALS

Freeport-McMoRan requires a competent person to perform a workplace examination before work begins or as employees begin work in that area. While some workplace examinations may only be the responsibility of one specified person, such as a Supervisor, this does not lessen your responsibility as it relates to safety.

A competent person is someone who has demonstrated the capability to identify existing and predictable hazards in the surroundings and can identify unsanitary, hazardous, or dangerous working conditions. This person has authorization to take prompt correct measures to eliminate them.

When new work groups enter an area, they should verify if a workplace examination has been completed. If not, the examination must be performed before work begins.

Freeport-McMoRan believes increased team involvement in workplace examinations is a key component to increased hazard recognition. Employees come from various backgrounds and experience levels. Varied experiences can contribute to an increased awareness of hazards and result in a more effective workplace examination. Whether on the job for one month or 25 years, your input is valued. Even though you may not specifically be designated by supervision, it is still ultimately your responsibility to maintain a level of awareness for hazards in your workplace or surrounding areas. The Department of Health and Safety (DOHS) team strongly encourages additional workplace examinations whenever environmental conditions change or when starting a new task. While this is not a requirement of MSHA, it is in line with best practices and core values.



Fig 2 Conducting a workplace exam

RECORD KEEPING

Depending on your site and department, maintaining and storing records of all workplace examinations may vary. Regardless of your department-specific handling policies, whenever a workplace examination is performed it needs to be given to a supervisor.

The timing for when a workplace examination form needs to be submitted to supervision usually falls into one of two options. The first option is to submit the form once the examination is completed. In this scenario, any new hazards found during the work shift will need to be documented on a new form. The other option is to maintain your workplace examination form as a working document throughout your shift. In this scenario, you will simply add to your existing form whenever a new hazard is discovered. You will then submit your examination form at the end of your shift.



Fig. 3 Completing the document

Records of each workplace examination will be maintained in accordance with Freeport-McMoRan's record retention policy. These records can be maintained in either hardcopy or electronic form and made available for inspection or copy upon request by MSHA or Miners' representative(s). These records must include:

- Date of the examination
- Examiner's name
- Work areas examined
- Description of each adverse condition not corrected promptly
- Date when the condition is corrected

MITIGATION OF FINDINGS

If a hazardous condition is found while performing an examination, immediate action to resolve the issue must occur. If a hazard is discovered that poses an immediate risk to personnel, production will be halted until the appropriate controls are in place. This may also include the need to post a spotter until proper flagging or barricading can occur.

Due to the variety of work performed at our sites, specific steps required to initiate hazard control can vary. Nonetheless, it should always include preventing access to the hazard and contacting your Supervisor or Health and Safety Professional.

When attempting to control a hazard, always refer back to the Hierarchy of Controls outlined in Fatality Prevention. Remember that elimination, substitution and engineering controls are almost always more effective than administrative controls and PPE. Whenever possible, apply the controls that keep the employee as safe as possible.

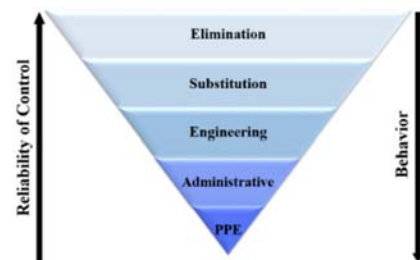


Fig. 4 Hierarchy of Controls

LEARN FROM OTHERS

On October 21, 2015, an employee was closing a 1000 lb. door to keep the rain out. In the process, the welds that held the three hinges in place broke causing the door to fall off. The door struck the employee on the back of his hard hat and across his shoulder blade causing him to fall to the ground.

The employee suffered a contusion to the head, shoulder, and knee and was given a return to work release with climbing restrictions.



Fig. 5 Door that fell



Fig. 6 Another angle of the fallen door

MODULE 1 QUIZ

Complete the following quiz.

1. In accordance with FCX requirements, how often should a workplace examination occur?
 - a. Once per hour
 - b. At the end of each shift
 - c. Before work begins or as employees begin work in that area

2. Why is it important to conduct a workplace examination?
 - a. To avoid MSHA fines
 - b. To recognize hazards prior to starting work
 - c. To ensure the previous shift was productive
 - d. None of the above

3. What defines someone as competent to conduct a workplace examination? (Circle all that apply)
 - a. Demonstrated capability of identifying existing and predictable hazards in working conditions
 - b. Understanding of operations in that work area
 - c. Authorized to promptly eliminate hazards in the work area

General Hazard Identification



MODULE 2

MODULE 2: GENERAL HAZARD IDENTIFICATION

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MODULE 2 LEARNING OBJECTIVES

Upon completion of Module 2, the students will be able to:

- Conduct a workplace examination by assessing a scenario for general hazards

INTRODUCTION

The keys to an effective workplace examination are strong hazard recognition skills along with personal accountability to the task. While the workplace examination is the first line of defense against hazards, it is only as effective as the person conducting it. Someone may be well-versed in the hazards of a job, but if they do not take the time to perform a proper examination, then the workplace exam becomes ineffective.

The following guidelines are necessary for performing an effective workplace examination:

- Ensure the appropriate form is being used.
 - Different tasks/departments at your site may require the use of a different form.
- Include as many people from your team as possible.
- Begin by defining the boundaries of your work area.
- Talk through the tasks being performed in the defined work area.
- Survey the work area from a distance.
 - Large hazards can be identified such as an open-hole, a suspended load, or moving equipment.
 - This may be easier from an elevated vantage point.
- Survey the work area from a closer point.
 - Look for housekeeping issues, tripping hazards, electrical issues, etc.
- Examine specific pieces of equipment relative to your job.

This module will provide examples of common hazards that exist on Freeport-McMoRan's properties. It is important to note this is not an all-encompassing list of hazards you can expect to find in your work area. Refer to your Health and Safety Professional or Supervisor for further clarification.



Fig. 7 Operator station on a train

EQUIPMENT

A wide variety of equipment is used on our properties. Equipment can be stationary or mobile and will have many uses. This course will focus on common or general hazards within the following three categories. This is not an all-encompassing list.

- Lifting equipment
- Welding equipment
- Grinding equipment

LIFTING EQUIPMENT

If lifting equipment is in your work area, note the travel path of the equipment and if it may cross your travel path at any time during your shift. Look for the operator's position in relation to the travel path of the equipment, and whether the operator will be able to see if a pedestrian were to cross the route.



Fig.8 Using lifting equipment

WELDING EQUIPMENT

Oftentimes many of our maintenance practices require welding. Welding is the process of fusing two or more metal pieces by bringing them to their melting point. Be aware of your surroundings and watch for indicators of welding in your work area.

Important questions to ask yourself when working in an area where welding is occurring are:

- Is the welding equipment mobile or in a fixed location?
- If welding is scheduled to be performed during your shift, is there a likelihood of being exposed to spatter?
- Are all materials (stinger, bottles, or lines) stored/secured properly?
- Are there any flammable materials stored near the welding equipment?
- Is the welder utilizing a flash screen?

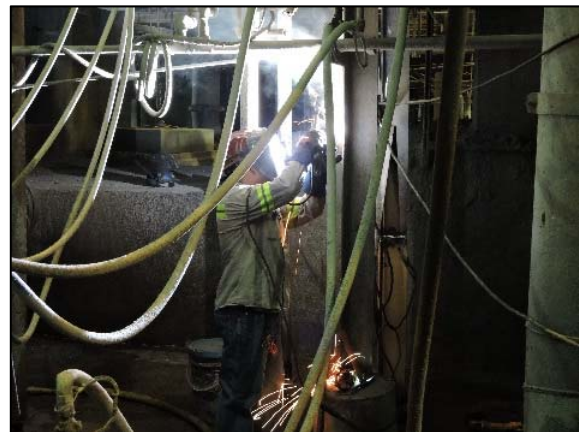


Fig. 9 Welding in the mill

If the welding equipment is mobile, be sure to apply these questions to any location where welding could occur.

GRINDING EQUIPMENT

In many workshops or work areas you will come across grinders. It is important to know the hazards associated working with or near grinders.

If grinders are in your work area, ask yourself:

- Is use of the grinder going to produce noise levels that could impact other people in the area?
- Are any generated sparks likely to affect a travelway?
- Are you using any flammable materials that may come into contact with sparks from the grinder?

If you are working with grinders, ask yourself:

- Are you turning off the grinder when not in use?
- Is there an 1/8" gap between the tool rest and grinding wheel?
- Is the grinding wheel rpm rated for the grinder?
- Is the peripheral hood capable of withstanding a bursting wheel and enclosing not less than 270°?



Fig. 10 Using a stationary grinder

GUARDS

Guarding is intended to prevent access into a hazardous area. Some forms of guarding are intended to prevent whole person access, while other forms only eliminate access into smaller areas. All forms of guarding should be maintained at all times.

When performing a workplace examination, note all areas where guarding should be installed. This can include, but is not limited to, machinery with exposed moving parts, shielding to protect against chemical contact, heat shielding, and noise dampening. If guarding deficiencies are discovered through a workplace examination, stop working until the guarding is repaired or reinstalled. These unguarded areas should be barricaded, flagged, and/or include a spotter until the hazard can be mitigated or eliminated. If the workplace examination reveals areas where guarding was never installed, but should have been, contact your Supervisor or Health and Safety Professional to begin the process.



Fig. 11 Proper guarding



Fig. 12 Guarding left on the ground

HOUSEKEEPING

Housekeeping is more than just picking up after yourself. Trash, debris, spills, and miscellaneous equipment/tools become a safety hazard when they obstruct walkways or working surfaces. Fine materials such as sawdust and silica, along with biological hazards such as improperly stored food or animal waste, can create a wide array of health hazards. Establish housekeeping habits by cleaning your area routinely and encourage others to do the same.



Fig. 13 Proper Housekeeping

SLIPPING/TRIPPING HAZARDS

Slips and trips can be caused by a wide variety of conditions. Some of these may include standing liquids, uneven surfaces, hoses or electrical cords, or stairs and ladders. If you happen to see standing liquids or puddles, avoid walking through it, establish appropriate barricading, and contact your Health and Safety Professional or Supervisor.

Questions to ask yourself:

- What is my travel path in this area?
- Are there any conditions that might lead to a slip or trip?

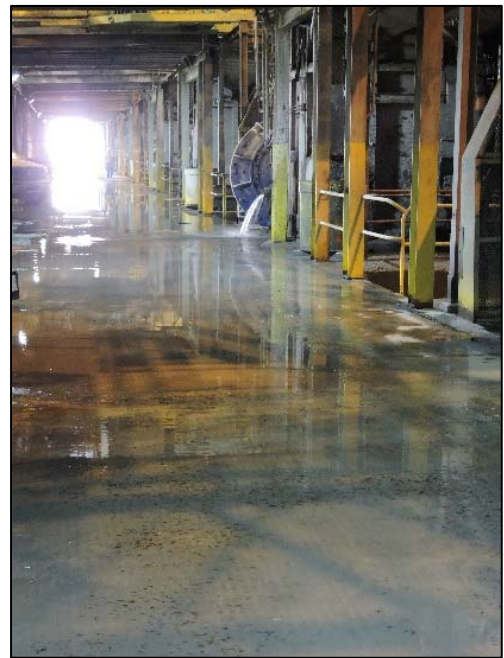


Fig. 14 Excess water leads to slipping incidents

TRASH/CLUTTER

Trash and clutter can result in injuries/health issues, if not removed from a work area. This can be a tripping hazard and, depending on the material, can cause cuts and scrapes. If the trash happens to be food waste, biological hazards may also be present. Trash and clutter can block escape routes, in the event of an emergency or evacuation. In the event of a fire, excess trash can provide an additional fuel source allowing the fire to spread quickly and easily.



Fig. 15 Trash and debris



Fig. 16 Water bottle left in walkway

IMPROPERLY STORED MATERIALS

Similar to trash/clutter, improperly stored materials can become a hazard when obstructing travelways. The risk of this hazard increases dramatically in the event of an emergency. When looking around your work area, note if all materials are stored in accordance with Freeport-McMoRan standards as well as manufacturers' instructions. While materials may be stored in the proper containers, if their weight exceeds the limits of the shelving system, then they are improperly stored.

If your work area contains liquids stored under pressure, ensure that the vessels are secured properly and that no valves are leaking. If you are storing liquid waste, verify that all containers are properly labeled (describing contents), secured, and free from leaks. If your work area contains various hazardous or reactive chemicals, make sure that there is no possibility of the chemicals mixing.

When storing materials, ensure that you utilize a rated flammable materials safety storage cabinet. All containers stored in the cabinet, regardless of the content, need to be properly labeled. Do not store items such as rags, cardboard containers, paper, or anything else that could become a fuel source should a fire occur.



Fig. 17 Properly stored tanks



Fig. 18 Improperly stored items

SIGNAGE

According to the Hierarchy of Controls, signs are classified as administrative controls. When immediate or potential health and safety hazards exist in a work area, warning signs must be posted at all approaches. Recognizing these signs enables you to easily understand the hazards and adhere to proper precautions while working. Pay attention to signs in your work area as they are intended to:

- Direct
- Warn
- Inform

For a sign to be effective in a working area, it must be positioned in an obvious location, be clean and legible, posted in the common language for that property, and oriented properly. During an emergency situation, you do not want to lose time by having to stop and focus on a sign that does not meet these standards. If during a workplace examination it is noted that there are signs that do not meet these standards, take the time to correct the problem, or notify Supervision so that the issue can be resolved. Remember, signage does not protect you from hazards; it is understanding and adhering to the signs that will protect you.



Fig. 19 Signs should be legible

ELECTRICAL

The majority of the equipment found on Freeport-McMoRan sites is powered by electricity. Electrical related citations from MSHA are some of the most common citations.



Fig. 20 Electrical panels

MISSING KNOCKOUT PLUGS

Electrical boxes are designed to allow for either single or multiple conduits. The conduit is attached to the electrical box at small pre-cut holes. These holes are covered with small knockout plugs that are intended to be broken away when the conduit is attached. Whenever an electrical box is modified in a manner that eliminates the need for a conduit, the remaining hole cannot be left open. A new knockout plug is used to mitigate this hazard. This is to ensure that no open holes exist in the electrical box.

As you perform your workplace examination, be sure to examine all electrical boxes for broken or missing knockout plugs. You also want to ensure that all electrical box access doors are working and can be properly secured. Electrical boxes should be free from any open areas. Never access an electrical box through an unused opening.



Fig. 21 Missing knockout plug

BROKEN OR DAMAGED CONDUITS

Electrical conduits are housing for live electrical lines. They are intended to prevent personnel from coming into direct contact with live systems. Broken conduits can lead to exposed wiring, which is a shock/electrocution hazard. While conducting your workplace examination, inspect any sections of conduit to which you have access. Pay close attention to any junctions or access points along the conduit, as these sections are where wire exposure can commonly occur.



Fig. 22 Exposed wiring on a conduit

IMPROPERLY LABELED/ ILLEGIBLE PANELS

Proper labeling of all electrical panels is critical to the safety of personnel. Improper or nonexistent labeling can contribute to major injuries or death during maintenance or emergency situations.

When inspecting the labeling of electrical panels, verify that all operational fuses are marked appropriately and accurately. If labels are damaged, missing, or not legible, the appropriate personnel needs to be notified so immediate corrective action can be taken. Only authorized and qualified individuals should open any panels. Additionally, note whether or not adequate lighting is in place to read all labeling. Any items labeled “spare” or something similar, must remain in the open position.



Fig. 23 Panel is difficult to read

Important questions to ask yourself when looking at electrical panels are:

- Is it difficult to read these labels?
- If so, is that due to lighting, legibility, or is something obstructing the view?

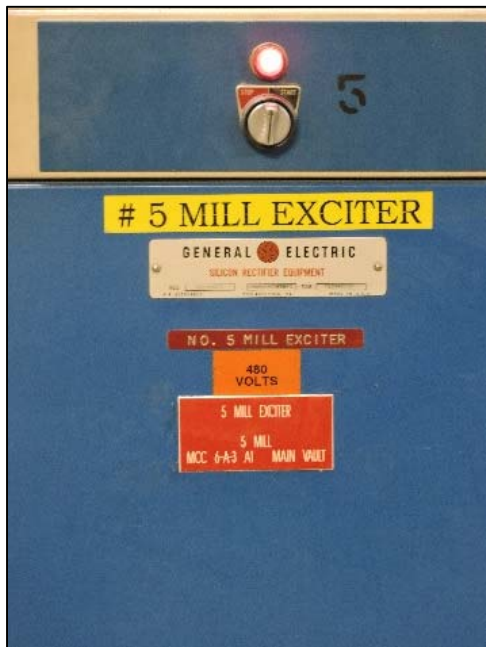


Fig. 24 Clear labeling



Fig. 25 Labeling on the door

EXPIRED GROUND CHECKS

All electrical equipment requires a ground check upon installation, after repairs or modifications, and annually thereafter. These checks are to test the continuity and resistance of the grounding system.

Some properties use a specific color-coded tape system to allow employees to determine at a glance if the equipment has been inspected or is out of compliance.

When performing a workplace examination, ensure that all electrical equipment has been tested. This is a simple task that can improve the overall safety of your work area. Questions to ask yourself include:

- Do you know the annual schedule for when ground checks are going to occur in your work area?
- Do you know the correct color for the current year?

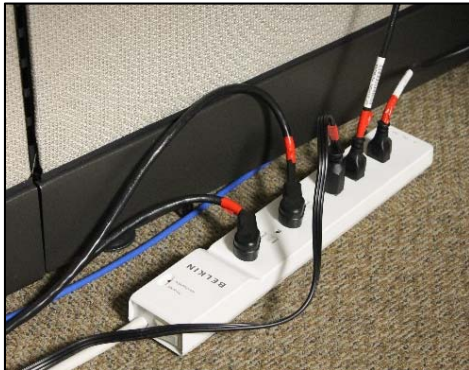


Fig. 26 Cords marked with colored tape



EMERGENCY PREPAREDNESS

In emergency situations, timing is critical. Procedures need to be in place and understood by all employees in a working area. While signs are posted directing employees to emergency routes, eyewash stations, and safety equipment, there are proactive measures that need to be routinely performed to further aid in these situations. Familiarize yourself with the expectations for your site and your workplace. Refer to your site-specific Health and Safety Professional or Supervisor for further clarification.



Fig. 27 Emergency station

FIRE EXTINGUISHERS/FIRST-AID KITS/AEDS

Knowing how to use a fire extinguisher is an important skill in the event of a fire. Unfortunately, this skill set is of little use if you do not know where fire extinguishers are located or if they are in proper working order. When performing your workplace examination, note the location of all fire extinguishers and check the tag and sticker for the dates of the last inspection. Additionally, ensure that signs are posted above each extinguisher and the area three feet around the extinguisher is free of obstructions. All extinguishers identified in the workplace examination need to be inspected to ensure proper working order. Ensure the correct type of fire extinguisher for the work being performed is readily available.

First-aid kits and automated external defibrillators (AEDs) can be extremely important during a health emergency. During your workplace examination, pay attention to the location of all first-aid kits and AEDs. Ensure first aid supplies with an expiration date, such as eye wash solution, are current.

When working with fire extinguishers, ask yourself:

- Is there any damage to the handle, nozzle, or hose?
- Is the safety pin correctly in place?
- Does the needle in the pressure gauge fall in the “Good” or green range?
- Is the inspection tag current?
- When was the last time the fire extinguisher was inverted in order to mix the chemicals inside?



Fig. 28 Fire extinguisher in the workplace

EMERGENCY EYEWASH STATIONS AND SHOWERS

Emergency eyewash stations and showers are often the difference between life-altering exposure events and a recoverable injury. Your eyes are especially susceptible to injury. In situations where contamination of the eye has occurred, the longer you wait for treatment the worse off your condition may become. While skin is much more resistant to damage than eyes, there are still certain exposures that will require immediate treatment.

Waiting for an event that requires the use of either an emergency eyewash station or shower is not the time to learn where they are located or if they are operational. As you enter your workplace, locate all emergency eyewash stations and showers. Inspect them to ensure they are functioning, clean, and free from debris. In addition, eyewashes and showers must have signage near them and the area around them must be clear of obstruction.



Fig. 29 Eyewash station with build-up

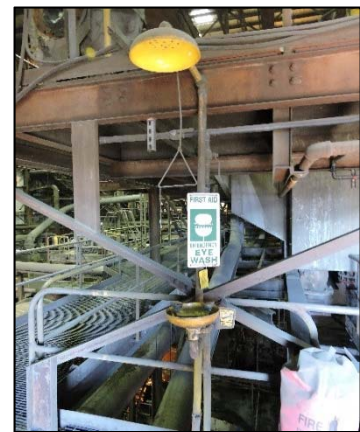


Fig. 30 Eyewash station and shower

EMERGENCY LIGHTING, EXIT SIGNS, AND EXIT ACCESS

Each work area has a detailed evacuation plan. Success of this plan in an emergency is partially dependent upon emergency lighting, exit signs, and clear access to all exit routes. Prior to conducting your workplace examination, familiarize yourself with this plan.



Fig. 31 Emergency lighting

Part of the workplace examination will include locating and testing the emergency lighting, locating and verifying that all exit signs are illuminated, and ensuring that access to all exits are free of obstructions. Emergency lighting can be tested by pressing the “Test” button or simply unplugging it. These systems could be the only source of light you are provided during the emergency.

TRAVELWAYS/ESCAPEWAYS

While travelways and escapeways come in a wide variety, their purpose is ultimately the same: to allow employees to travel on foot from one area to another. They may be traveled frequently or rarely, but it is important that they remain a safe route for all employees at all times.

Safe access along any path that is traveled for work, repair, or maintenance should be kept free of debris or obstruction, easily accessible, and well-lit.

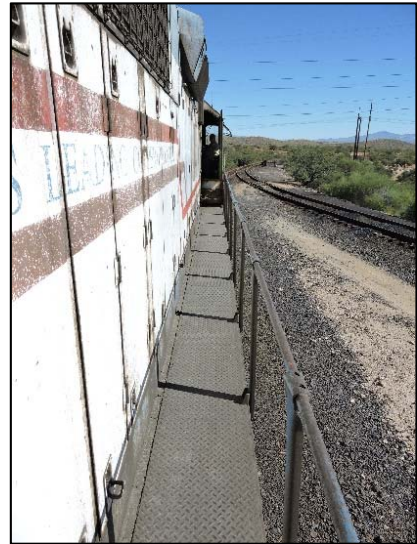


Fig. 32 Travelway along a locomotive

RAILINGS AND TOE BOARDS

Handrails, midrails, and toe boards are provided to protect employees from falling to a lower level or to protect those working or traveling beneath the elevated walkway. As you enter a work area, be aware of either the presence or absence of railing systems along travelways. Where railing systems are installed, look for broken or missing sections. Along travelways without railing systems, ask yourself if a fall from heights is possible.

When working near or walking through an area with railings and toe boards, ask yourself:

- Are there any missing bolts or hardware?
- Is there an installed toe board along all areas that have midrails and handrails?
- Is the inspection tag current?
- If a fall hazard exists, do you need to be wearing fall protection?



Fig 33 Railing systems and toe boards in place

OVERHEAD CLEARANCE

Overhead clearance is another integral part of safe access along travelways or escapeways. Some properties have infrastructure or equipment that may require employees to duck as they pass.

The presence of an overhead crane can add another hazard to the workplace when in use. Alarms and lights may be used to warn employees of a moving crane. During a workplace exam, be aware of any overhead hazards, as well as any associated warning devices.



Fig. 34 Overhead clearance along a road

OPEN HOLES

The presence of an unguarded/non-barricaded open hole along any travelway or escape route is considered an imminent danger. To be considered an open hole, a person can fall through the opening to a lower level. A horizontal opening must measure 12 inches (30 cm) or more in its least dimension, and a vertical opening must be at least 30 inches (76 cm) tall and 18 inches (46cm) wide. If a person cannot accidentally walk to the hole due to fixed machinery, equipment, or walls, a secure cover that supports at least twice the expected load and leaves no more than 1 inch (2.5cm) openings must be used and labeled “Hole” or “Cover”.

In the event a workplace examination reveals an open hole, production should immediately stop, Health and Safety Professionals and Supervision should be notified, and proper barricading must be installed. Always consider whether a fall from heights is possible when working around open holes.



Fig. 35 Even when guarded, open holes pose a risk

CONVEYORS

Conveyors along travelways can present multiple hazards. Material can fall from the conveyor and collect along the travelway. If left uncontrolled, the build-up of material can present a trip hazard, or can completely impede travel along the path. Unguarded conveyors can project material, as well as expose employees to moving machinery.

Also, be aware of conveyance systems overhead. Do not walk or work under overhead conveyors that do not have guards installed. When guards are installed, look carefully for any gaps that may exist in the guarding and build-up of excess material, as it can easily fall and strike workers below.



Fig. 36 Walkway and stairs along a conveyor

GROUND CONTROL

Maintaining awareness of your surroundings in the pit is critical for both employees and equipment. Freeport-McMoRan mandates that ground conditions in the pit be inspected at least once per shift. These inspections are part of a workplace examination. This type of examination is performed by either a Supervisor or a qualified individual assigned by supervision. Even though you may not be the person conducting this examination, you still have a responsibility to examine ground conditions as you travel through the pit area.

Regardless of the type of equipment you are operating in the pit, visual examinations will commonly include looking for these hazards:

- Cracks
- Raveling
- Erosion
- Water seepage
- Bulging

It is just as important to be aware of conditions that may lead to the above mentioned hazards. Some of these conditions include, but are not limited to:

- Burrowing wildlife
- Weather
 - Precipitation
 - Freeze/thaw cycles
 - High speed winds
- Root systems
- Seismic activity
 - Blasting
 - Vehicle movement
 - Earthquakes
- Change in slope stability
 - Large scale – from bench to bench
 - Small scale - stockpiles

When an unsafe condition is noted, stop work immediately and contact your Health and Safety Professional or Supervisor.

HIGHWALLS AND BENCHES

As ore is removed from the pit, the resulting vertical face is known as a highwall and the horizontal surface is known as a bench. Benches are formed by removing layers and are typically the primary level of operation for material removal. They also provide access routes throughout the mine. Benches perform many functions by catching rocks and other sliding material and by reducing the angles and lengths of slopes. The walls of these benches and other straight vertical cliffs that rise above our heads are referred to as highwalls. Highwalls are typically a minimum of 50 ft. in height.



Fig. 37 Visible highwalls and benches

Maintaining these surfaces is critical to the stability of the pit itself. The first step in maintaining these surfaces is a visual examination. When examining benches, begin by focusing on the level upon which you are standing or driving. Benches need to be clean of debris, rocks, and boulders, and should be continuously monitored for loose material. When inspecting highwalls, watch for rocks, boulders, or large masses of material that could loosen or dislodge from the face or crest. Once you have examined the level on which you are working, scan the levels above and below you, and look for noticeable signs of defect.

STOCKPILES

Stockpiles are temporary deposits of ore. To form a stockpile, material is unloaded by haul trucks above the top of the stockpile. When this material is eventually taken to other processing areas, it is removed from the bottom of the pile first. This process is known as undercutting and will cause a change in the angle of repose (the natural angle at which the material settles when initially deposited). By changing the angle of repose, stockpiles are made substantially less stable and can lead to material shift.

Whenever you find yourself in the area of a stockpile, look for signs of slope failure. Additionally, if ore is being actively deposited, be aware of any personnel or equipment near the bottom of the pile that could be engulfed or crushed if a shift in the stockpile was to occur.



Fig. 38 Working near a stockpile

BERMS AND GUARDRAILS

Any section of road that has a drop off large enough for a vehicle to overturn must be controlled with either a guardrail or a berm. The height of the guardrail/berm must be equal to or greater than the mid-axle height of the largest vehicle that travels that road. The width of the berm will vary based on the physical properties of the material used and the equipment that travels the road.

While gaps are permitted for drainage purposes, they should not be large enough that a vehicle can pass through them. If you see insufficient berms or guardrails while driving on any part of our properties, notify a supervisor immediately. If you are unsure about the size and stability of the guardrails or berms along your route, always err on the side of caution and contact your Supervisor.



Fig. 39 Monitor berm height

ACTIVITY 3: HAZARDS IN THE WORKPLACE

Conduct a workplace examination by identifying the existing hazard(s) in each photograph and the potential consequence. If there is not one present, write “none.”

1.



Existing Hazard(s) / Potential Consequence

2.



Existing Hazard(s) / Potential Consequence

3.



Existing Hazard(s) / Potential Consequence

4.



Existing Hazard(s) / Potential Consequence

5.



Existing Hazard(s) / Potential Consequence

6.



Existing Hazard(s) / Potential Consequence

7.



Existing Hazard(s) / Potential Consequence

8.



Existing Hazard(s) / Potential Consequence

ACTIVITY 4: TEACH ME

Assigned hazard topic: _____

Hazards to consider:

(Use your Student Guide to assist you)

Talking points:

(What do you want your classmates to understand about this topic? What are some key concepts? How can you apply this topic to your workplace?)

MODULE 2 QUIZ

Complete the following quiz.

1. What is the purpose of guarding?
 - a. Prevent access into a hazardous area
 - b. Provide another location to store PPE
 - c. Protect equipment from dust and debris

2. What are some examples of good housekeeping? (Circle all that apply)
 - a. Disposing of trash
 - b. Cleaning up puddles or leaks
 - c. Wearing the correct dust mask
 - d. Securing ladders in the tool shop

3. What determines the height of a berm?
 - a. The Supervisor
 - b. The depth of the pit
 - c. The type of ore body being mined
 - d. The height of the mid-axle of the largest vehicle

WORKPLACE EXAMINATIONS CONCLUSION

The importance of a good workplace examination cannot be understated. This is the first step taken every shift or prior to beginning a new task, which leads to a safe return home. Everyone has worked a job where complacency to hazardous conditions is witnessed. For some, this behavior has resulted in an incident where an injury occurred. For others, perhaps luck was on their side. The mining industry and the work we perform every day does not lend itself to the lucky ones of the group. Safety on a mine site is an actively achieved task and it starts with the workplace examination.

As your career with Freeport-McMoRan progresses, remember that conducting a workplace examination is a continuous process. Good hazard recognition skills along with a strong understanding of how to implement critical controls are the backbone of a successful one. Knowledge of the processes performed in the area plays a significant role as well. Unfortunately, none of this means much if even the most experienced employee does not take the examination seriously.

Begin each day with a focus on safety. By having a proactive approach to your work area or one you are passing through, and taking the time to mitigate hazards, you are creating a safer workplace for you and those around you.

Resources



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GLOSSARY

Competent Person	One who has demonstrated the capability of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
Conveyors	A moving belt system that is typically used to relocate items from one location to another.
Electrical	Refers to the use of electricity as a power source.
Guards/Guarding	An object placed between personnel and hazards. Designed to keep any portion of the body from contact (intentional or inadvertent) with a hazard. Shielded, fenced, or enclosed by covers, casings, shields, troughs, spillways, or railings, or guarded by position or location. Examples of guarding methods are guarding by location (positioning hazards so they are inaccessible to employees) and point of operation guarding (using barrier guards, two-hand tripping devices, electronic safety devices, or other such devices.)
Hierarchy of Controls	A means of evaluating risks and identifying controls. Those controls designated as more conservative and most effective are at the top of the hierarchy, while the less conservative and least effective are at the bottom.
Housekeeping	The act of maintaining cleanliness and order by removing trash/debris, cleaning up spills, putting away equipment/tools, and keeping walkways or working surfaces free from obstructions.
MSHA	Mine Safety and Health Administration
Overhead Clearance	The amount of overhead space a person or piece of equipment needs to avoid impact with infrastructure or equipment.
Travelway	A path that allows employees to travel on foot from one area to another.

Spotter

An individual responsible for monitoring or preventing access to a designated hazard. Flagging or barricading may or may not be present.

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STUDENT COURSE EVALUATION

Course Title

Site

Date

Your Name (optional)

Facilitator

Directions: Circle the number that best fits your level of agreement with the statement. Then complete the short answer questions.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. The course content was relevant to my job.	1	2	3	4
2. The course materials were clear and well written.	1	2	3	4
3. The lecture, discussions, and activities improved the quality of the course.	1	2	3	4
4. The facilitator was knowledgeable about the content.	1	2	3	4
5. The facilitator created an atmosphere that enhanced my learning.	1	2	3	4
6. I am confident I can apply the course content to my job.	1	2	3	4
7. The course met my expectations.	1	2	3	4
8. What did you find valuable in the course?				
9. What can be improved in the course?				
10. Please clarify your responses (questions 1-8) and provide any additional comments.				

Thank you for taking the time to complete this evaluation. We value your feedback.

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