![Freeport-McMoRan logo]

FREEPORT-McMoRan

STUDENT GUIDE

SFT FCX1021C
FATAL RISK MANAGEMENT

March 2019

VERSION 2

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LEARNING OBJECTIVES

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

Upon completion of this course, students will be able to:

- Select the appropriate Fatal Risk Management icons based on the hazards associated with the task and environment
- Identify appropriate Fatal Risk Management tools specific to the needs of the work area and employees
- Differentiate the roles and responsibilities of employees, supervisors, and managers
- Demonstrate effective communication skills for transferring program concepts to employees

COURSE INTRODUCTION

Through Fatality Prevention, employees were introduced to seven key elements to educate and empower his or her role in keeping safety a priority: communication, messaging and perception, accountability, stopping work, situational risks and outcomes, pre-job planning, and evaluating and improving controls. In an effort to continuously improve the Fatality Prevention Program, the Department of Health and Safety (DOHS) has developed the Fatal Risk Management (FRM) program. Arming employees and supervisors with the education and tools to identify the Fatal Risks and Critical Controls present across all Freeport-McMoRan operating properties not only minimizes the risks of the job, but promotes a safer working environment for any affected individual. While the seven elements mentioned above are an integral part of preventing fatalities, there is an opportunity to further clarify the potential for Fatal Risks and the specific Critical Controls that can manage those risks.

Freeport-McMoRan supplies each employee with specific tools to perform their job safely and efficiently. Fatal Risk Management was created to further enhance the measures currently in place. With the appropriate communication and plan in place, Fatal Risk Management can be used to enhance conversations in the field, JSAs, SOP reviews, and even tailgate talks.

In short, employees need to know what will kill them at work and what must be done to prevent that from occurring.

Explanation of the FRM Concept

EXPLANATION OF THE FRM CONCEPT

Explanation of the FRM Concept

INTRODUCTION

Standardizing communication means understanding the same message. In order to accomplish this, we need to be speaking in the same terms, or a common language. DOHS recognized the need for commonality amongst the highest priority Fatal Risks. Fatal Risk Management bridges the gap between the properties by introducing a common set of icons used to identify Fatal Risks (what will kill you).

FRM was developed to clarify the potential for Fatal Risks, identify Critical Controls to manage those risks, and standardize the communication. The intent of this training is to increase awareness and education around Fatal Risks and Critical Controls.

FATAL RISKS

While all risks have danger to some degree, the intent of this training is to focus in on the Fatal Risks, or the risks that will get you killed. These are risks that when not controlled have the potential to cause serious injury or death. It is important to note that these Fatal Risks are the risks that <u>will</u> get you killed, versus what <u>may</u> kill you. For example, look at the task of operating a light duty vehicle on a road next to a river. The Fatal Risk in this task is vehicle collision or rollover. Drowning would not be a Fatal Risk because that scenario would occur outside of the normal operation of the light vehicle.

Review the examples of job roles or tasks, and associated Fatal Risk(s) in the table below.

Job Role	Task	Fatal Risks
Heavy Equipment Operator	Stockpile Maintenance	• Vehicle impact on person • Ground failure • Vehicle collision or rollover
Lineman	Electrical Line Repair	• Exposure to Electrical Hazards • Fall from heights
Hydromet Diagnostic Mechanic	HDPE Handling and Repair	• Lifting operations • Uncontrolled release of energy

CRITICAL CONTROLS

For each identified Fatal Risk, a list of necessary Critical Controls was developed to prevent or mitigate the most serious consequences of these risks. These Critical Controls are considered the most impactful on preventing a fatality or preventing an injury and have been previously established based on data.

Once the Fatal Risk is identified, applying the most effective Critical Control is crucial. A Critical Control is a device, system, or process implemented to eliminate or reduce the risk of a task/job, and if missing or overlooked has the potential to lead to catastrophic outcomes, such as serious injury or death. The absence or failure of a Critical Control significantly increases the risk of death despite the existence of other controls.

The Hierarchy of Controls should be utilized when selecting, reviewing, and evaluating Critical Controls. This will ensure the most effective control is being implemented to mitigate the Fatal Risk.

The table lists the Critical Controls for each Fatal Risk previously mentioned for this task.

Task	Fatal Risk	Critical Controls
Electrical Line Repair	Exposure to Electrical Hazards	- Access Control - Barriers and Segregation - Drawings and Labels - Electrical PPE - Energized Electrical Work Permit Execution - Energy Isolation/LOTOTO
	Fall from Height	- Fall protection system - Fixed work platform - Mobile work platform - Leading edge/open hole protection - Scaffold

FATAL RISK MANAGEMENT OVERVIEW

The goal of Fatal Risk Management is to eliminate fatalities, standardize the communication around Fatal Risks (the things that will kill you), and teach employees how to control those risks. Standardizing the message and meaning behind every hazard is no small feat.

In order to implement Fatal Risk Management on each property, the basic concept of the program needs to be understood. The following graphic shows the relationship between the primary components of the program and how they each support Fatal Risk Management.

Identify the "risks that will kill you"

Track successes and failures to trend progress

Fatal Risk Management

Implement the "things that will keep you safe"

Stop the work if something is not safe

Verify Critical Controls in place in the field

Fig. 1.1 Relationship within Fatal Risk Management

UNDERSTANDING THE ICONS

Communication does not necessarily include only speech. We utilize images or visual triggers to receive other messages. Think of the many signs you see along the roads you travel. Each sign is posted to deliver a message or warning when human interaction is not possible.

To ensure success of the message, the images or icons need to be understood. By presenting this information globally, the sender and receiver of the message can translate the same meaning and react appropriately.

Fig 1.2 Road signs communicating a potential hazard

ICON SELECTION

In order to focus on the most relevant risks, an in-depth analysis of the past ten years was conducted centering on fatal incidents and potential fatal events that have occurred at our properties. The results of this analysis aided in the identification of the most significant Fatal Risks and Critical Controls. Between January 2010 and December 2018, 70 fatalities have occurred on our properties. In short, 70 people never returned home that day.

Each icon has been carefully selected to communicate the possible exposure to a Fatal Risk. The table below lists the Fatal Risks, accompanying icon, related PFE, and a discussion block.

Icon	Description
	Interaction with Aircraft • Interaction with manned, unmanned, fixed and rotary wing aircraft. • Job roles/tasks: Piloting UAS (unmanned aerial systems), piloting manned aircraft

Incident

When mobilizing to a new fly camp location, a passenger disembarked from the helicopter and moved to the front of the helicopter as instructed; however, the individual did not stop at the designated 'safe location' but continued to move onward onto an up-sloping area that put him in near contact with the rotor blades. The employee had received a pre-flight safety briefing.

The flight crew knew of this particular hazard at this helipad and avoiding this hazard was emphasized in the pre-flight briefing.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Blasting • Exposure to thermal, overpressure, and fragment hazards associated with explosives and explosive components • Job roles/tasks: Explosives Vehicle Operator and Blasting Personnel

Incident

A blasting team was preparing for a shot in the pit. The security department conducted clearance of nearby non-mining areas; however, an exploration drill site 650 feet (200 meters) away was not cleared of employees. When the blast pattern was shot, fly rock measuring approximately 5 inches (15 centimeters) landed at the drill site. No employee injury or equipment damage occurred.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Confined Space • Exposure to a hazardous environment in a confined space • Job roles/tasks: Utility work, trenching/excavating, entering into machinery, pits and sumps, tanks

Incident

A contractor started to work on a locked out valve just outside of the confined space after being told not to as it was locked out for the confined space work. The valve needed to be turned so that the valve wheel allowed operator access. While the contractor worked on the valve, it opened and solution started to pour on the employee who was welding inside the confined space. The employee dropped the welding lead into the solution and received a shock. The employee was helped outside.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Exposure to Electrical Hazards • Exposure to electrical shock or arc flash • Job roles/task: Lineman, Electrician, maintenance on a pump

Incident

Contract electricians / lineman were assigned to work on three pole structures just off of the access road. While repositioning the bucket, the top portion of the knuckle made contact with one of the energized 69kv line, resulting in a short to one of the de-energized 12.5 lines causing it to break. No employee injury or equipment damage occurred.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Contact with Molten Material • Coming into contact with material • Job roles/tasks: Smelting, work around furnaces and converters and anode plants, refining, rod mill, tapping

Incident

Smelter Operator was cleaning the ISA Furnace concentrate feed-port. While attempting to remove the cleaning hammer from the port, the employee was splashed with molten material causing second and third degree burns to the head and neck. The employee was wearing the required PPE.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Drowning • Exposure to the risk of drowning in natural or manmade bodies of water or other vats, cells, vessels, and other open containers of liquid • Job roles/tasks: Boat usage, tailings work, vats, tanks

Incident

As employees were working at a tailings pond barge, they noticed that water had risen above the platform. Before they could reach the system control panel, the barge suddenly flipped over and the occupants fell into the reservoir. Workers were wearing lifejackets and swam to shore. Moderate injuries were documented.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Entanglement and Crushing • Contact with machinery/moving parts (entanglement, crushing, pinching, penetrating, and cutting forces) • Job roles/tasks: Conveyor work, vehicle maintenance, equipment maintenance, proximity to any of the above

Incident

A crew used a 50 ton jack to align links with sprocket teeth as they pulled chain segments over the head assembly of an apron feeder. The three segments above the one they were working on were not supported. When the links dropped onto the sprocket, it jolted, caused the pulley to roll, and the three unsupported pans fell. The third segment caught an employee's forearm between the journal and the sprocket fracturing both bones.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Exposure to Hazardous Substances - Acute • Workplace exposure to substances that are immediately toxic, asphyxiating or corrosive (e.g. H_2S gas, NO_x gas, CO gas, concentrated acids, caustics, etc.) • Job roles/tasks: chemical handling, acid loading and unloading, smelter work, tankhouses, moly circuits, and processing plants

Incident

After a shutdown, a molybdenum de-oiling kiln was locked out to allow for cleaning of the kiln discharge. Wearing a respirator, an operator began clearing the build-up with a chisel. At that moment, he noticed a dust cloud developing and an unfamiliar odor. The operator left the kiln to retrieve a full-face respirator. En route to the chemical plant control room, he complained of feeling dizzy and was transported to the hospital for medical evaluation. It was determined the operator was exposed to carbon monoxide.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Exposure to Hazardous Substances - Chronic • Workplace exposure to substances that can cause lethal disease overtime (e.g. silica, arsenic, lead, welding fumes, asbestos, acid mist, etc.) • Job roles/tasks: chemical handling, in-pit operations, smelter work, tankhouses, moly circuits, and processing plants

Incident

There have been several confirmed cases of silicosis, including at least one fatality.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Fall from Heights • Working at height where the danger of falling exists • Job roles/tasks: Roof work, climbing, exposure to unprotected edges

Incident

A contractor was assisting with the removal of a steel beam using a crane. The steel beam was located underneath a hanging head pulley. Removing the steel beam created an opening in the area. As the beam was being lifted into a stable and flat position, the employee slipped and fell through the opening. He fell approximately 13 feet (4 meters) and landed on the roof of a conveyor. Employee was immediately transported for a medical evaluation.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Falling Objects • Exposure to falling objects (e.g. tools, materials, equipment, structures, etc.) • Job roles/tasks: Work overhead, stacked materials

Incident

Employee was closing a door on the plant, due to rainy conditions. The welds holding the three hinges in place failed causing the door to fall. The door struck the employee on the back of the hard hat and his shoulder blade knocking him to the ground. Employee suffered minor injuries.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Fire • Exposure to thermal, particulate, gas or vapor hazards from a fire • Job roles/tasks: Hot work, receiving of potentially flammable or combustible materials, startup or maintenance of smelter/furnace/dryer operations

Incident

During a three-day heat up schedule on a furnace, the pipe burners malfunctioned creating an oxygen-deficient environment. The operator that was assigned to fire watch immediately isolated the gas and began trying to re-ignite the burners. He experienced difficulty in re-lighting the burners for 20 minutes, at which point an uncontrolled combustion of the natural gas occurred inside of the furnace, causing flames to eject out the mouth. The operator was working on an elevated platform a few feet (1 meter) away from the flames but was unharmed.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Ground Failure • Exposure to failure of natural slopes and temporary or permanent slopes which are excavated or constructed in relation to mining activities or associated supporting infrastructure • Job roles/tasks: Trenching and excavation, work around highwalls/benches/slopes, stockpiles, dumps

Incident

A severe rain event triggered a series of mudslides on a mountain slope. The event caused a large debris flow of soil, vegetation, and large boulders to descend a steep river channel into the town below. The mudslide took the lives of two employees and damaged infrastructure throughout the town.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Lifting Operations • Exposure to loss of control of a load suspended by a crane (fixed or mobile), hoist, forklift, boom or other lifting equipment • Job roles/tasks: Crane use, forklift use, other rigging/hoisting operations

Incident

Mechanics were changing wet end parts on a mill cyclone feed pump. A suction plate weighing 3.5 tons was being mounted with a secondary hook on the 15 ton bridge crane (primary hook is 75 ton). After positioning the suction plate and installing approximately 60% of the nuts on the lugs of the pump, the mechanics heard a loud noise occurring from the failure of the 1.5" wire sling (rated for 21 tons). This projected the crane hook approximately 65 feet (20 meters) up, landing on the walkway. There were no injuries.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Personnel Hoisting • Contact with, exposure to, or unintended consequences related to the movement of people or equipment via underground hoisting or aerial tramways • Job roles/tasks: Hoist/tram operations, inspections, and maintenance

Incident

While raising a man bucket with two occupants in a service shaft, the winder tripped causing the man bucket to fall approximately 65 feet (20 meters). Normally, a brake should engage automatically. The emergency brake had to be engaged manually. No employee injuries or equipment damage occurred.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Rail Collision • Locomotive, rolling stock, or other rail equipment colliding with or being hit by other vehicles, buildings, or equipment • Job roles/tasks: Work in and around rail yards and tracks

Incident

A locomotive was returning to service after having had preventative maintenance. As it approached a descent on the tracks, the engineer noticed the brakes were not functional. He was not able to gain control of the locomotive, called a Mayday, and dismounted. The locomotive went off the tracks shortly after sliding several feet before impacting a semi-truck. The sole injury was a sprain/strain by the semi-truck operator.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Rail Impact on Person • Locomotive, rolling stock, or other rail equipment coming into contact with a person • Job roles/tasks: Work in and around rail yards and tracks, where personnel are in the area

Incident

Employee was inspecting the brakes and wheels on a rail flat when he stepped on the parallel tracks and was struck by an oncoming flat. The flat car rolled over his foot and derailed. Employee suffered injuries to his lower and upper extremities.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Uncontrolled Release of Energy • Exposure to stored energy from pressure; items under tension or compression • Job roles/tasks: Work including maintenance, testing, diagnostics, and commissioning of live systems, HDPE activities, pressurized vessels and systems, unloading of materials (straps), pneumatic tire work

Incident

A cook was using a pressurized pot in the kitchen of the camp mess hall. While the cook was nearby and two other employees were about 10 feet (approximately 3 meters) away, the pot exploded. The explosion caused property damage and minor injuries.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Underground Hazardous Atmosphere • Exposure to toxic atmosphere or oxygen deprivation underground • Job roles/tasks: Drilling operations, blasting operations, chemical/hazardous material use (paint, epoxy, etc.), vehicle operations underground (emissions and diesel particulate matter)

Incident

Two contractors were conducting routine core sampling from a drilling location underground. They were traveling through a tunnel in a truck when their portable gas detectors started to indicate a low level of oxygen. Both employees realized the ventilation in the area was off. While they were attempting to exit the area, the truck lost power. Both employees started to feel dizzy and experienced difficulty breathing. They decided to immediately exit the vehicle and walk out of the area.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Underground Inrush • Exposure to crushing forces or oxygen deprivation caused by the sudden ingress of liquids or solids underground • Job roles/tasks: Work in and around wet muck areas

Incident

While cleaning up a spill on a conveyor belt, a rush of materials began sliding towards the group of employees. One employee was hit in the arm by a rock, but all personnel were able to escape. Employee suffered fractured elbow.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Underground Rock Fall • Exposure to rock that falls from the back or sidewalls underground • Job roles/tasks: Jumbo operations, panel development, barring down/scaling activities, rock bolting activities

Incident

An employee was working under an unsupported ground after a blast. A rock weighing approximately 55 lbs (25 kg) fell from the rook striking the employee in the head. Employee sustained a cut on his head.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Vehicle Collision or Rollover • Collision with another vehicle or fixed/moving object; driving over an edge; rolling over • Job roles/tasks: mobile equipment and light vehicle interaction, driving on uneven surfaces (dumps, benches, edges/cliffs)

Incident

An employee was traveling to a maintenance shop on a haul road. Eight haul trucks drove by creating a partial obstruction with the dust and their lights. Employee drove into the right hand berm to avoid collision. No spotters were in the area and no equipment contact was made.

What jobs or tasks are related to this Fatal Risk?

Icon	Description
	Vehicle Impact with Person • Person struck by vehicle/mobile equipment • Job roles/tasks: Personnel in or around vehicles or vehicle travelways, vehicles operation off roads (lots, warehouses, storage areas)

Incident

Two employees were retrieving a vehicle after a repair. One employee positioned himself between this vehicle and another vehicle to conduct a pre-operation inspection. The second employee turned on the ignition. The vehicle was in 1st gear and moved forward, pinning the first employee between the vehicles. Employee suffered minor injuries.

What jobs or tasks are related to this Fatal Risk?

How FRM Works

HOW FRM WORKS

TOOLS

There are three tools available within Fatal Risk Management: the icons, verification questions, and the Cority system. The use of these tools by supervisors will help enhance tailgate meetings, improve field verification of Critical Controls, and empower employees to stop work, when appropriate.

Fig. 2.1 Training in a classroom

ICONS

As mentioned earlier, the icons were developed as a visual cue intended to quickly communicate a Fatal Risk in an area or related to a specific task. They can be used in a number of ways. Each method of use will vary from site to site and each site is responsible for determining how the icons are implemented.

As a reminder, the icons represent the most critical Fatal Risks, or their roots, for all operating locations, however it is possible not all risks will be captured. If a site believes a Fatal Risk is missing or an additional icon should be created, it is imperative that this concern is addressed with supervision or management who can then bring it to the attention of DOHS.

Note: Do not attempt to modify, alter, or create any portion of the Fatal Risk Management program, such as icons, Critical Controls, or verification questions.

VERIFICATION QUESTIONS

For each Fatal Risk, a set of Critical Controls was developed, which then prompted the creation of verification questions. The verification questions help ensure that Critical Controls are in place. In some cases, a single task might have multiple Fatal Risks associated with it.

Prior to performing a job, the operator and/or crew should identify any potential Fatal Risks, implement Critical Controls, and then ask themselves the relevant questions. If a Critical Control is not in place or implemented in an effective manner, then the job must be stopped until the issue is addressed.

The verification questions encourage dialogue between the supervisor and employees during tailgates and out in the field. Conversations can be directed in preparation for, at the onset of, or during a job. The verification questions are an additional layer of accountability that the Critical Controls are in place. It is important to keep these lines of communication open, so that safety stays at the forefront of every decision. Forms are one way to implement the verification questions. An example of a Verification Form is shown below.

CORITY

Cority has been in use for years in the company. We use it for Occupational Health and Industrial Hygiene. Cority is used to input data, analyze trends, and generate reports. When a Critical Control is found to be missing or ineffective (a verification question has been answered "no"), the job is stopped and the situation is corrected. This event can then be recorded in Cority.   This information is vital in identifying gaps within our current procedures and practices."

By querying specific data, supervisors can track the use or misuse of Critical Controls. This aids in Critical Control concerns and improvements. This information can be compared and shared across the sites.

Field verifications conducted with verification questions by supervisors or management can be loaded into the Cority system.
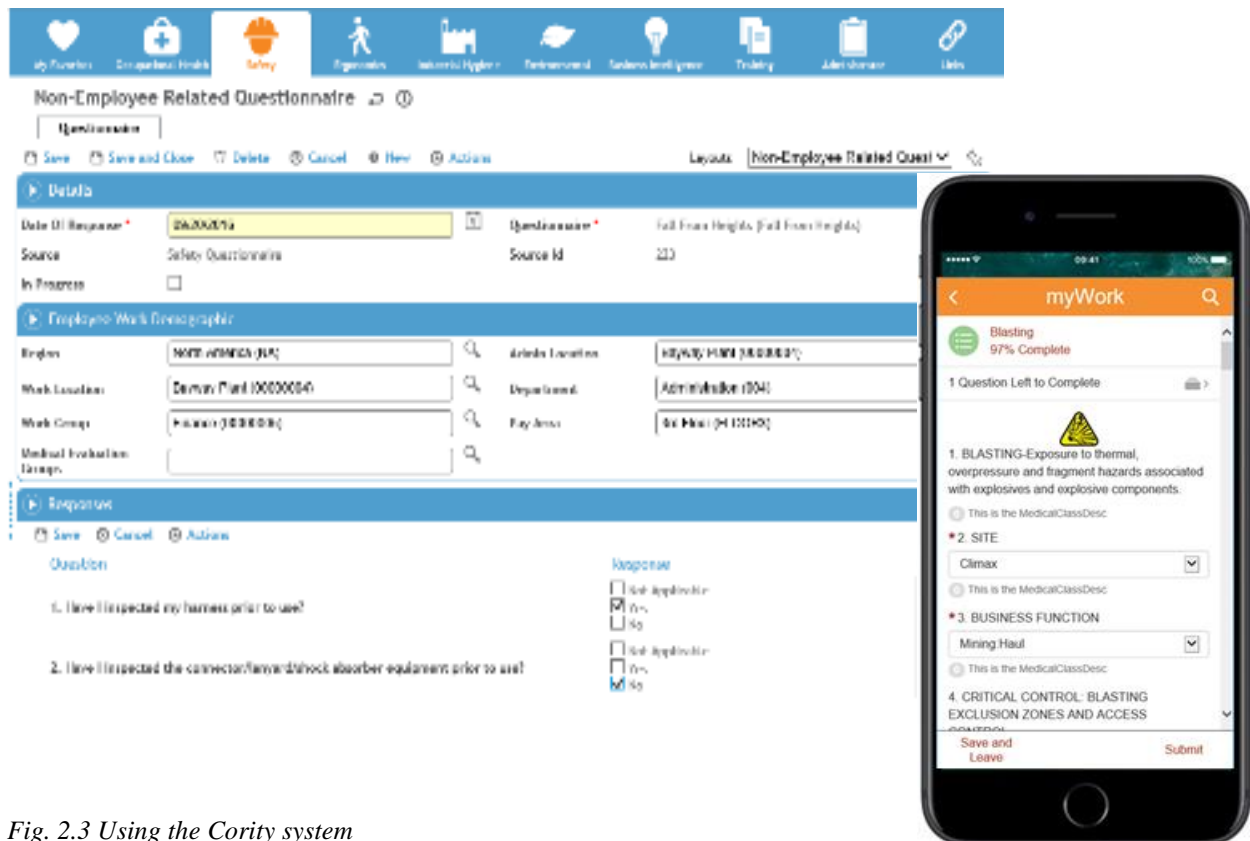
Fig. 2.3 Using the Cority system
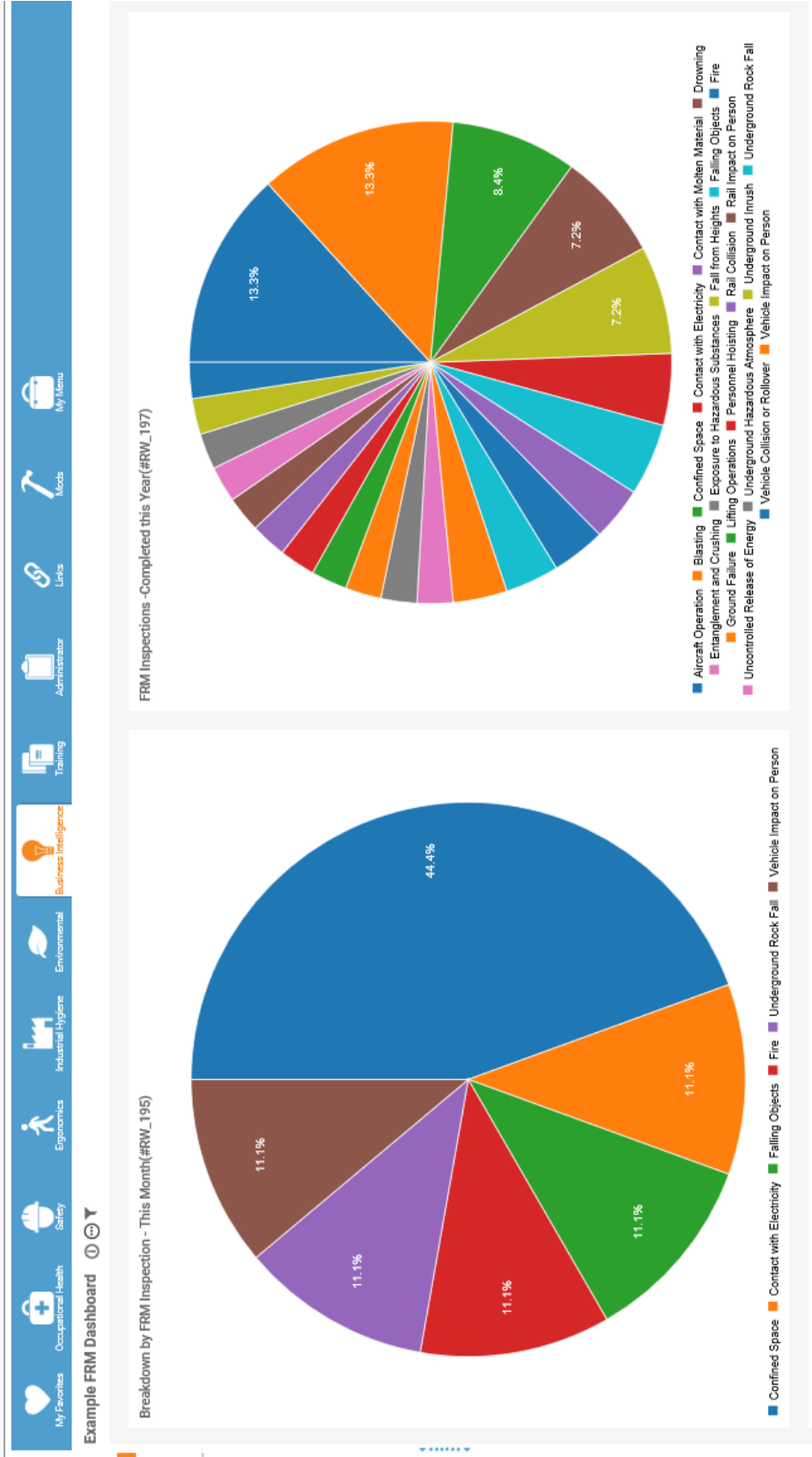
Figs 2.4 Examples of generated Cority report

APPLICATION OF THE TOOLS

Each property is empowered to implement tools in a way that is most effective for them. Some recommendations include laminating verification questions, displaying posters of verification questions or icons, creating icon stickers, or building a notebook with relevant verification questions. Regardless of the approach, the key to success is to educate and communicate.

Fig. 2.5 Example of a Verification Form

Fig. 2.7 Example of icons with verification questions checklists

Fig. 2.6 Example of icons with verification question cards

Fig. 2.6 Example of icon signage

FRM EXPECTATIONS

- Each Fatal Risk has a set of Critical Controls that should be known by all applicable employees
- The Critical Controls must be in place prior to beginning work
- If a Critical Control is missing or not effective, immediately stop the job until controls are implemented
- Prioritization can take many forms; should not be limited to only those tasks that are more controlled by behavior
- All approved FRM material is found on the DOHS SharePoint site
- Utilize only approved icons and verification questions in the field
- Be creative with how they are utilized but remember overuse can make them ineffective
- Do not modify or add icons unless approved by DOHS.
- Do not modify or add verification questions unless approved by DOHS

ROLES AND RESPONSIBILITIES

We are all responsible for working in a safe and efficient manner. Tiered positions exist within companies to provide structure and guidance. Understanding how each role fits within the program is important for its continued success. Ultimately, each site will define the specifics around the frequency of and the person responsible for the verification questions. This section will look at the roles and responsibilities of an employee, supervisor, and manager within the Fatal Risk Management program.

THE EMPLOYEE

The employee performs the tasks needed to successfully complete the job. That person is exposed to the risks more often than any other position on the property. He/she plays a vital role in preventing fatalities or injuries by identifying any issues or potential issues, and ensuring Critical Controls are in place.

In conjunction with the verification questions, the employee should also continually ask him/herself the following questions:

- Have I identified the Fatal Risks?
- Are Critical Controls in place to prevent getting killed?
- Am I stopping work if something is missing?

If any of these are answered with a "no", stop the job.

Fig. 2.8 Employees at work

THE SUPERVISOR

While the supervisor may not be performing the job out in the field like the employee, he/she also greatly impacts the Fatal Risk management program. It is up to the supervisor to ensure their employees understand the process, potential Fatal Risks, and available Critical Controls for the tasks or jobs they are performing. This can be accomplished by leading discussions at tailgate meetings and in the field, as well as verifying that employees have identified the Fatal Risks and are using Critical Controls to prevent being killed. It is important that the messages being conveyed center on safe production, rather than production pressure. Supervisors are also responsible for providing the necessary resources to employees to ensure jobs are performed safely.

The supervisor should consider the questions below when interacting with the employees:

- Have the Fatal Risks been identified?
- Are the Critical Controls in place?
- Do the employees feel empowered to stop the job when Critical Controls are not in place?
- Am I taking the time to review the verification questions throughout the day?

*Fig. 2.9 Verifying risks are understood*

THE MANAGER

The manager is responsible for many areas and people at their site. He/she must rely on the supervisor and employee to act responsibly and safely; however, it is not uncommon for the manager to verify the supervisor(s) are following the expectations of the program. Managers should be providing systems, tools, and resources to the site and the supervisors; verifying appropriate use in the field and at the administration level; and developing milestones, expectations, plans, and accountability.

In an effort to maintain consistency in their management of the program, the manager should ask themselves the following questions:

- Am I identifying and communicating the Fatal Risks for my site?
- Have I ensured the policies, procedures, training, tools, and equipment are in place to support the Critical Controls?
- Am I verifying these in the field?

Manager verification – Count and compliance
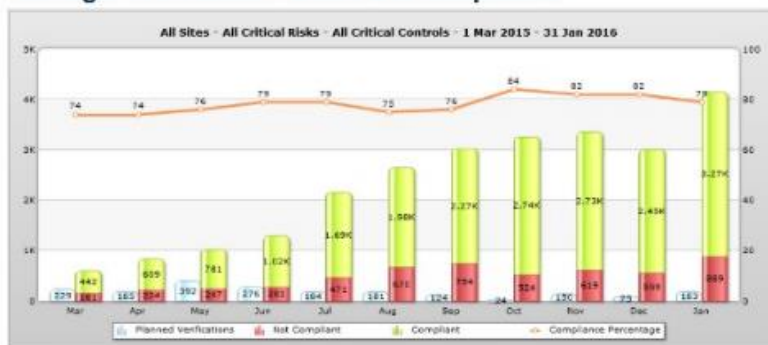
Supervisor verification – Count and compliance
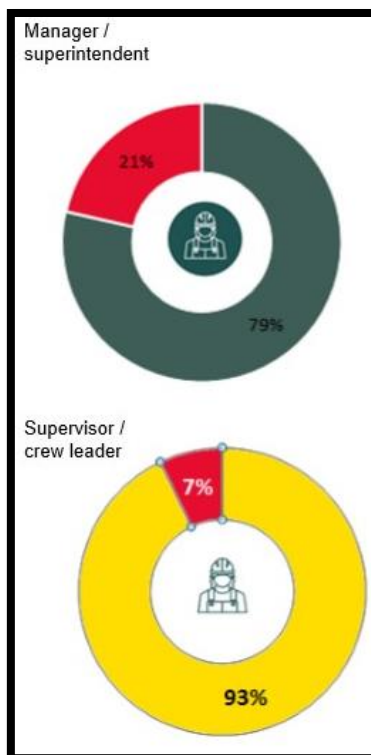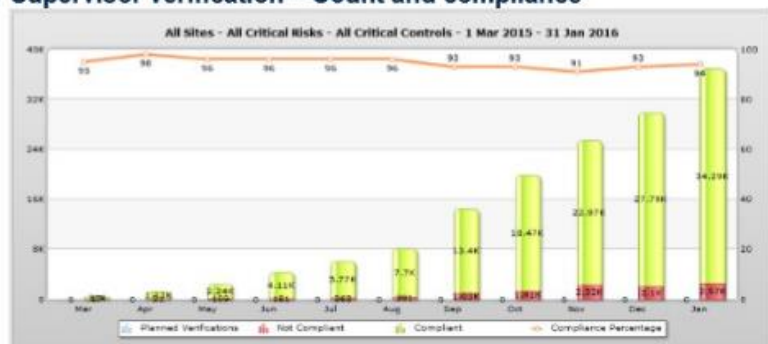

Fig. 2.10 Examples of available reports for managers

COMMUNICATING THE PROGRAM

There are many ways to communicate. Employees, crews, and leadership have discussions on a daily basis, whether it is a tailgate, a meeting, or small talk. Dedicating time to perfecting the message will be important when describing the concepts of the Fatal Risk Management program. This section provides tools to aid in that conversation and ensure that the information is understood.

EFFECTIVELY COMMUNICATING TO EMPLOYEES

In Fatality Prevention, we learn about the power of the message, and how the sender and receiver can misinterpret the information. Body language and tone of voice can influence the strength or importance of the message. When preparing to speak with frontline employees, take the time to practice your message and interaction.

- Is there an opportunity for it to be received differently than intended?
- Does it relate to increasing awareness around Fatal Risks and Critical Controls?
- Can it be perceived as a production pressure message?

Use of the icons and discussions about "what will kill you" are new. Consider the different ways they can be misinterpreted and keep those in mind as you speak about the program. More clear discussions should occur not to scare, but to encourage employees to speak freely and openly about hazards. It is important that employees understand the Fatal Risk Management program, in its entirety.

Fig. 2.11 Communicating with employees during a line out

SUPERVISOR TALKING POINTS

The Supervisor Talking Points is another tool available for use when communicating the program to employees. Review the document prior to training and be available should questions arise. By having the conversation both before and after the training, the employee is more likely to understand and retain what is expected of him/her.

SUPERVISOR TALKING POINTS
FATAL RISK MANAGEMENT

Fatal Risk Management expands on the concepts learned in Fatality Prevention, and provides field supervisors and employees with a set of tools to bring conversations about Fatal Risks and Critical Controls to the field. Discussions should focus on understanding what tasks and jobs can get us killed, and what controls can be put in place to prevent serious injury and death. The purpose of Fatal Risk Management is to improve communications in the field and prevent fatalities.

WHEN COMMUNICATING THE PROGRAM TO YOUR CREW:

EXPLAIN THE PURPOSE OF FATAL RISK MANAGEMENT
- Identify fatal risks –the things that can kill us– and critical controls –the things that can prevent death-
- Use the tools to increase communication and understanding of the risks that we work with, and the controls that are available to us

REVIEW THE TOOLS AVAILABLE
- Icons for each Fatal Risk
- Checklists with Critical Controls for each risk
- Medgate System for tracking

COMMUNICATE YOUR EXPECTATIONS
- Operators should use the icons to identify fatal risks of your tasks
- Operators can reference the critical controls based on the risks to ensure work is performed safely
- Crews can communicate better about fatal risks and critical controls in tailgate meetings and line-outs
- Supervisors will use the checklists to verify critical controls are in place in the field
- Checklists will lead to conversations about better and more effective implementation of controls

IMPORTANT POINTS TO NOTE:

SHOULD NOT CREATE ADDITIONAL WORK
- Icons are quick reference, and can lead to more effective tailgates
- Checklists are not additional work –should replace or integrate with other things we are doing in the field
- No expectation that the checklists will be filled out and turned in by operators

ENCOURAGE CREATIVITY
- Discuss ways the icons and checklists can be used in your area (stickers, posters, magnets, sandwich boards, etc)
- You are a team, and this this your space...make fatal risk management your own in ways that work for you!

Fig. 2.12 Supervisor Talking Points for Fatal Risk Management

For each photo, determine which Fatal Risk(s) is/are applicable for the work area in the photo. Remember that tasks/jobs can have multiple Fatal Risks.

|			
Interaction with Aircraft	Blasting	Confined Space	Exposure to Electrical Hazards
Contact with Molten Material	Drowning	Entanglement and Crushing	Exposure to Hazardous Substances - Acute
Exposure to Hazardous Substances - Chronic	Fall from Height	Falling Objects	Fire
Ground Failure	Lifting Operations	Personnel Hoisting	Rail Collision
Rail Impact on Person	Uncontrolled Release of Energy	Underground Hazardous Atmosphere	Underground Inrush
Underground Rock Fall	Vehicle Collision or Rollover	Vehicle Impact on Person	

1. Area Housekeeping

Task: Clean and organize the area

Tools: Forklift, hand dolly, other necessary tools for cleaning

Factors: Vendor is parked outside the working area and is using a dolly to replace empty cylinders in the background, no weather concerns

Potential Fatal Risks

2. Replace Building Panels
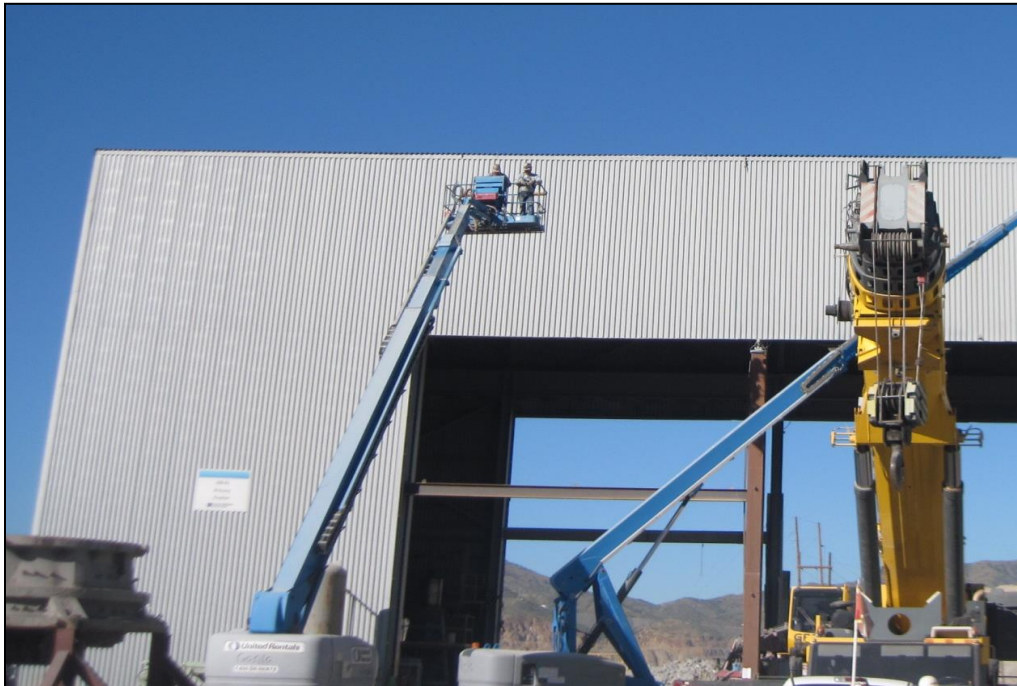
Task: Replace panels on top of the building

Tools: Crane, two manlifts, necessary hand and power tools

Factors: Not in a roadway, not exposed to other traffic or equipment, no weather concerns

Potential Fatal Risks

Using the FRM Every Day, Every Job… SG page, review each photo and determine which Fatal Risk(s) is/are present for the task/job in the photo. Then list the relevant Critical Control(s). Remember that tasks/jobs can have multiple Fatal Risks.

Fatal Risk Management

FREEPORT-McMoRan

Every Day, Every Job...

Identify Fatal Risks | Implement Critical Controls | Stop The Work If Something Is Missing

Fatal Risks	Critical Controls
What will **kill** me?	What can **protect** me?

Interaction with Aircraft
- Qualified Personnel
- Aircraft Suitability & Maintenance
- UAS/UAV Pre Mission Planning
- Positive Communication System
- Fixed Rotary Aircraft Pre Mission Planning

Blasting
- Blasting Exclusion Zones And Access Control
- Execution Of Charging And Handling Protocol
- Inspection Of Explosives Transportation Vehicle
- Management Of Misfires
- Segregation Of Explosives During Transportation

Confined Space
- Atmospheric Monitoring
- Energy Isolation/LOTOTO
- Entry Permit Execution

Exposure to Electrical Hazards
- Access Control
- Barriers and Segregation
- Electrical PPE
- Drawings and Labels
- Energized Electrical Work Permit Execution
- Energy Isolation/LOTOTO

Contact with Molten Material
- Access Control
- Cooling Element Monitoring
- Engineered Molten Metal Conveyance System
- Fire Suppression Systems (Molten Metal Hauler)
- Hot Metal PPE
- Furnace And Taphole Integrity
- Pot Level Controls
- Process Controls

Drowning
- Access Control
- Access Integrity
- Barriers And Segregation
- Flotation Devices
- Rescue Plan

Entanglement and Crushing
- Blocking For Maintenance Work
- Energy Isolation/LOTOTO
- Guards, Barriers And Barricades

Hazardous Substances Acute
- Access Control
- Alarm Systems
- Engineered Controls
- Handling Requirements
- Loading And Unloading Protection
- Mechanical Integrity Of Storage And Distribution
- PPE

Hazardous Substances Chronic
- Access Control
- Handling Requirements
- Engineered Controls
- PPE

Fall from Heights
- Fall Protection System
- Fixed Work Platform
- Leading Edge /Open Hole Protection
- Mobile Work Platform
- Scaffold

Fatal Risks	Critical Controls
What will **kill** me?	What can **protect** me?

Falling Objects

- Barriers And Segregation
- Integrity Of Overhead Structures And Equipment
- Securing Devices
- Work Area Management

Fire

- Alarm Systems
- Evacuation Plan
- Fire Suppression Systems
- Hot Work Permit Execution
- Rescue Systems
- Segregation And Storage

Ground Failure

- Awareness And Reporting
- Excavation /Trenching Execution
- Geotechnical Inspection And Monitoring
- Slope Plan Execution

Lifting Operations

- Barriers And Segregation
- Lifting Execution
- Mechanical Integrity Of Lifting Equipment

Personnel Hoisting

- Engineered Hoisting System
- Positive Communication Systems

Rail Collision

- Access Control
- Fit For Work And Fatigue Management
- Operator Competency
- Positive Communication System
- Scheduling, Separation And Traffic Control
- Signaling And Signage

Rail Impact on Person

- Access Control
- Equipment Maintenance
- Positive Communication System
- Securing Rolling Stock
- Segregation
- Signaling And Signage

Fatal Risks	Critical Controls
What will **kill** me?	What can **protect** me?

Uncontrolled Release of Energy

- Energy Isolation/LOTOTO
- Guards, Barriers And Barricades
- HDPE Management
- Hose Coupling Lock System
- Piping Hoses And Equipment Mechanical Integrity
- Relief Valves
- Tensioned Lines Management

Underground Inrush

- Backfill Management And Control
- Draw Point Management And Control
- Entry Point Barriers
- Ore Passes, Chutes & Raise Controls
- Probe Drilling

Underground Hazardous Atmosphere

- Refuge Chambers
- Self Rescuer
- Ventilation Monitoring
- Ventilation System

Underground Rock Fall

- Engineered Support Systems
- Geotechnical Inspections And Monitoring Systems
- Ground Control Management Plan Execution
- Scaling

Vehicle Collision or Rollover

- Access Control
- Fit For Work And Fatigue Management
- Operator Competency
- Positive Communication System
- Road Design And Maintenance
- Segregation
- Signage And Demarcation
- Vehicle Preoperational Inspection

Vehicle Impact on Person

- Fundamentally Stable Parking
- Positive Communication System
- Segregation
- Signage And Demarcation
- Vehicle Preoperational Inspection

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3. Pipeline Repair / Inspection

Task: Maintenance and repair on a pipeline

Work: Cut the pipe, enter the pipe to clear an obstruction, weld the pipe back together

Tools: Crane, necessary hand and power tools

Factors: Not in a roadway, not exposed to other traffic or equipment, no weather concerns

Potential Fatal Risks	Critical Controls

4. Clean-up and Inspection around Conveyor

Task: Clean-up and inspection around conveyor

Work: Inspection, clean up and possibly minor maintenance

Tools: Required hand and power tools, including shovels

Factors: Not working at heights, no equipment or vehicles in the area, no weather concerns, and the conveyor is running

Potential Fatal Risks	Critical Controls

5. Underground Utility Repair

Task: Underground utility repair

Work: Entering a trench, cutting a section of pipe, and welding the pipe back together

Tools: Crane and required hand and power tools

Factors: Not in a roadway or exposed to other traffic or equipment, and no weather concerns

Potential Fatal Risks	Critical Controls

Using the Fatal Risk Operator Reference Guide, review each photo and determine which Fatal Risk(s) is/are present for the task/job in the photo. Then list the relevant Critical Control(s). Remember that tasks/jobs can have multiple Fatal Risks.

6. Process Tank Entry

Task: Process tank entry

Work: Entering tank to replace cover plate

Tools: Drop ladder, tripod rescue unit, torch/welder, and required hand/power tools

Factors: LOTOTO and required blocks and blinds performed; work communicated with affected individuals in the area; and proper flagging and barricading erected

Potential Fatal Risks	Critical Controls

7. Remove Broken Roaster Arm

Task: Remove broken roaster arm

Work: Removing a broken arm out of the roaster while roaster is hot

Tools: Forklift, chains, and other rigging supplies

Factors: Draft valves are 100% open; area is properly flagged and barricaded; and work communicated with affected individuals in the area

Potential Fatal Risks	Critical Controls

8. Sample Materials

Task: Sample materials

Work: Mix chemicals and sample resulting solutions

Tools: Acids, bases, beakers, hot plate, vent hood

Factors: Area is free of tripping hazards and housekeeping issues; limited employees working in the area on similar tasks

Potential Fatal Risks	Critical Controls

FRM Implementation and Progression

IMPLEMENTING THE PROGRAM

Fatal Risk Management is new and therefore will take time to implement. There are projected timelines for each segment of the deployment. These time frames are approximate and are intended to represent the length of time expected to train each property. As the number of employees vary per site, so will the timelines.

RECOMMENDED PROGRESSION

Sample road map for rolling out FRM:

- Weeks 1-2: Icon Introduction
- Weeks 3-4: Critical Control Discussions
- Weeks 5-6: Verification Question Overview
- Weeks 7-8: Putting It Together

WEEKS 1-2

These are projected timelines for the rollout of each segment:

- Use Supervisor Talking Points to introduce the program
- Discuss applicable icons (2-3 per day)
- Group discussions to incorporate icon use per job, task and reason for selection
- Reinforce message on Fatal Risks and stopping the job

WEEKS 3-4

These are projected timelines for the rollout of each segment:

- Introduce Critical Control concepts
- Group discussions around Critical Controls

WEEKS 5-6

These are projected timelines for the rollout of each segment:

- Introduce verification questions
- Continue discussions on Fatal Risks, icons, and Critical Controls

WEEKS 7-8

These are projected timelines for the rollout of each segment:

- Each day, use one job or task to discuss all Fatal Risks, Critical Controls, and verification questions
- Employees will lead further discussions

ACTIVITY 6: TAILGATE TALK

Using the space below, create a tailgate or discussion to your crew explaining each of the tools. Then, propose at least one way that you would implement use of the icons at your site.

Tailgate or Discussion Notes

Implementation Proposal

According to the Safety and Health Policy, "The safety and health of all Freeport-McMoRan Inc. employees is of the highest priority and a core value of the company. It is crucial that we communicate with each other. Everyone must be aware of Fatal Risks and Critical Controls in the workplace. Using guidelines and tools will allow everyone to go home safely."

Fatal Risk Management is a continuation of the Fatality Prevention Program. Supervisors are introduced to key concepts to aid in their communication and roll out of the program to their frontline employees. Focus is placed on identifying Fatal Risks and Critical Controls in an attempt to safeguard all employees within the Company. Implementation of the program will be determined at the site level, which allows for customization and creativity.

Ultimately, Fatality Prevention is a living program and needs to be nurtured to grow. The program is owned by every front line employee, supervisor, manager, and leader. Encourage conversation around the concept of Fatal Risk management, so that it becomes a part of the language and work habits.

Taking the time to understand and deliver the message of working safely is important. Employees that are informed and encouraged to work smarter greatly affect the workforce.

RESOURCES

GLOSSARY

Authorized Individual A qualified person who has the permissions, need, and knowledge to perform a specific task in a specific area. This person is accountable for the safety of the work they are performing.

Awareness Training A level of training that shall be provided to all employees, contractors, and visitors, whose work areas are or may be in an areas where work may be performed utilizing GSR program work procedures, to ensure that the purpose and function of the GSR program are understood by employees.

Caution Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. Shall be used in minor hazard situations where a non-immediate or potential hazard or unsafe practice presents a lesser threat of employee injury.

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

Critical Controls A device, system, or process implemented to eliminate or reduce the risk for a task/job, and if missing or overlooked has the potential to lead to catastrophic outcomes such as serious injury or death.

Critical Risk A risk that if not controlled has the potential to lead to catastrophic outcomes such as serious injury or death.

Danger Indicates a hazardous situation that, if not avoided, will result in death or serious injury. The signal word "DANGER" is to be limited to the most extreme situations. DANGER [signs] should not be used for property damage hazards unless personal injury risk appropriate to these levels is also involved. Shall be used in major hazard situations where an immediate hazard presents a threat of death or serious injury to employees. Danger tags shall be used only in these situations.

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).

Guardrail System A handrail and midrail system, with a toe-board, that meets regulatory regulations. May be of a temporary or permanent nature.

|	
Hazardous Atmosphere	An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following: Flammable gas, vapor, or mist greater than 10% of the lower flammable or explosive limit (LFL or LEL). Airborne combustible dust at a concentration that meets or exceeds its LFL Note: This concentration may be approximated as a condition in which the combustible dust obscures vision at a distance of 5 feet (1.5 meters) or less. Atmospheric oxygen concentration below 19.5% or above 23.5%. Atmospheric concentration in excess of the occupational exposure limit for any substance that is capable of causing death, incapacitation, impairment of ability to self- rescue, injury, or acute illness due to its health effects and which could result in employee exposure in excess of its dose or permissible exposure limit Any other atmospheric condition that is immediately dangerous to life or health (e.g. heat).
Hazardous Gas	For purposes of this standard, process-related gases such as hydrogen sulfide, nitrogen, carbon dioxide or other toxic/harmful gases which can be released from the process.
Hazardous Material	Any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.
Hot Work	Work that has the potential of creating or becoming a source of ignition. This includes grinding, welding, thermal or oxygen cutting or heating, and other related heat, open flame or spark producing operations.
Inspection	A safety inspection looks at the physical conditions and work practices in a workplace. Equipment is examined to determine whether all safeguards are in place and whether its operation presents any hazards. Air, water, and other samples may be obtained to test for hazardous substances. Work practices are observed to identify unsafe actions. The overall goal of a safety inspection is to identify hazards so they can be eliminated, guarded, or protected against.
Light Vehicle	As used in this standard, includes any vehicle small enough to travel on public roads and highways normally.
Lockout, Tagout, Tryout (LOTOTO)	A method of isolating potentially hazardous energy sources required whenever servicing, maintenance, modification, or installation activities are performed. Systems must be de-energized, isolated, purged and tried prior to performing work. Procedurally, this is placement of a lock and tag on the energy isolating device in accordance with an established procedure, indicating that the energy isolating device shall not be operated until the removal of the lock/tag in accordance with an established procedure.

Near Miss An unplanned event that did not result in physical injury or illness to people, damage to property, or loss to process or production, but had the potential to do so.

Qualified Person One who, by possession of a recognized degree, certificate or professional standing or who by knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work or the project.

Safety Audit A safety audit involves measuring and collecting information about the reliability and effectiveness of the safety inspections, programs, training, plans and systems within a workplace. The relationship between a safety inspection and a safety audit is that a safety audit is used to determine whether the safety inspection is returning accurate, reliable, and complete results. A safety audit is verification that the safety programs are working.

Warning Indicates a hazardous situation that, if not avoided, could result in death or serious injury. WARNING [signs] should not be used for property damage hazards unless personal injury risk appropriate to this level is also involved.

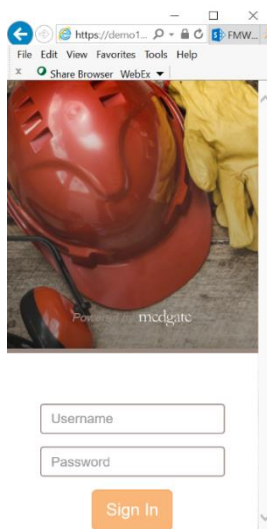## USING THE CORITY SYSTEM

Instructions are provided for using the Cority system.

LOGGING INTO THE CORITY SITE

1. On the Mobile Home Screen, click the "Sign In" button
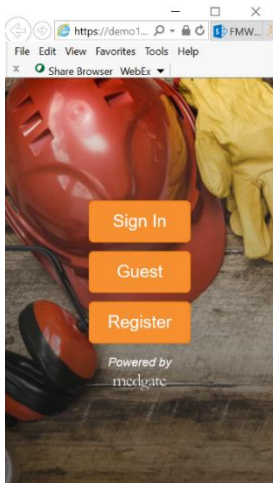
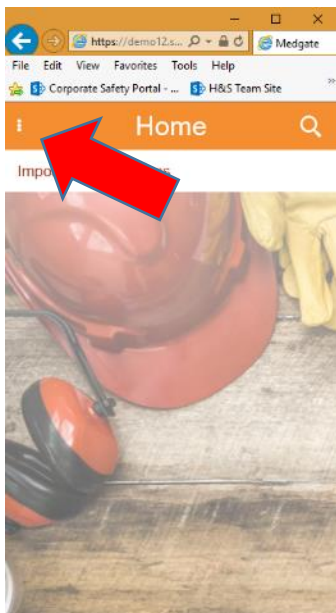2. Enter your FCX computer user name and password in the Username field

ENTERING AN FRM FIELD VERIFICATION INTO THE CORITY MOBILE SYSTEM WHILE CONNECTED
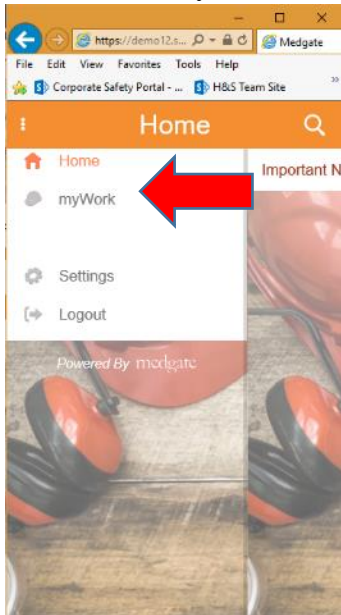
1. Once you have logged into the Cority Mobile site, you should see the Home screen
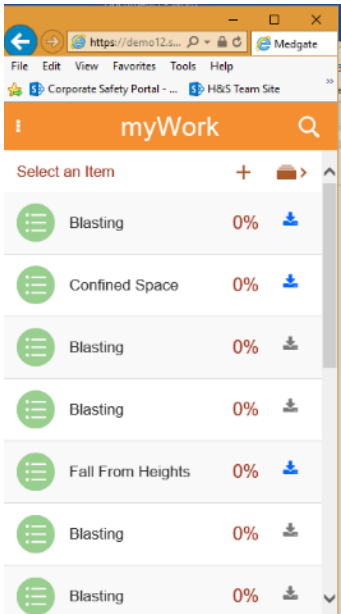

2. From the Home Screen, tap the 3 dots in the top left hand corner of the screen
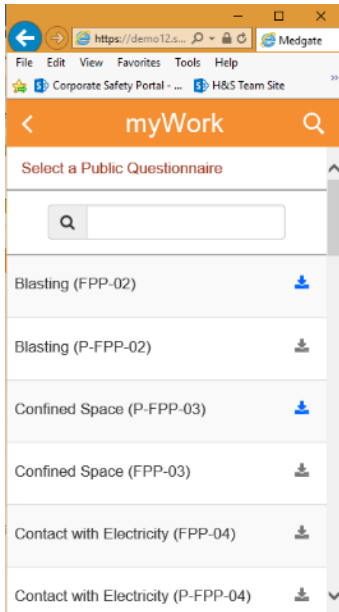
3. This will show you the Cority Mobile menu options

4. Tap the "myWork" option on the screen

5. The myWork screen will display any questionnaires that you have started or completed. To start a new questionnaire, tap the plus (+) toward the top of the screen.


6. This will show you the full list of questionnaires. Tap the questionnaire that you want to complete to get started.

Use the drop downs for each question to select Yes, No, or N/A. Every questions must be answered before it can be submitted.

- "Yes" indicates that the verification question was in place at the time that you observed it.
- "No" indicates that some piece of the control was not in place. Stop the job and get the situation addressed before continuing.
- If the control or question is not applicable for the job, then select N/A.

Once you have filled out all of the questions, the "Save" and "Leave and Submit" options will light up. Tap "Save" and leave if you want to come back and review the questionnaire before submitting. Select "Submit" when you are completely finished with the questionnaire. Once submitted is selected, you are no longer able to edit the questionnaire.
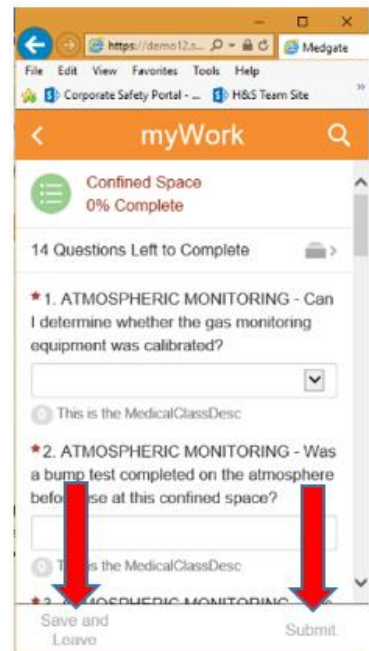
ENTERING AN FRM FIELD VERIFICATION INTO THE CORITY MOBILE SYSTEM WHILE OFFLINE

You can enter an FRM Field Verification into the Cority Mobile system while you are offline, if you have done the following things:

- While online, you logged into the system with you username and password
- You downloaded a questionnaire onto your mobile device
- You did not close the internet browser with Cority between the time you downloaded the questionnaire and the point in time in which you went offline

DOWNLOADING A QUESTIONNAIRE

From the myWork screen, click the plus sign (+) in the top right.
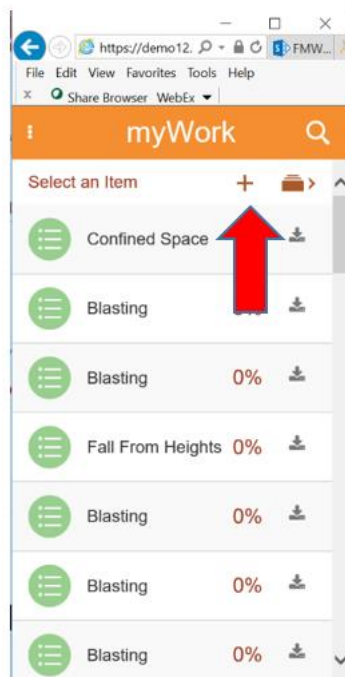
From the list of questionnaires that appear, click the download button to right of the questionnaire that you would like to complete offline. You will see a message on the screen to indicate that the questionnaire was successfully downloaded. The icon will also change from gray to blue.
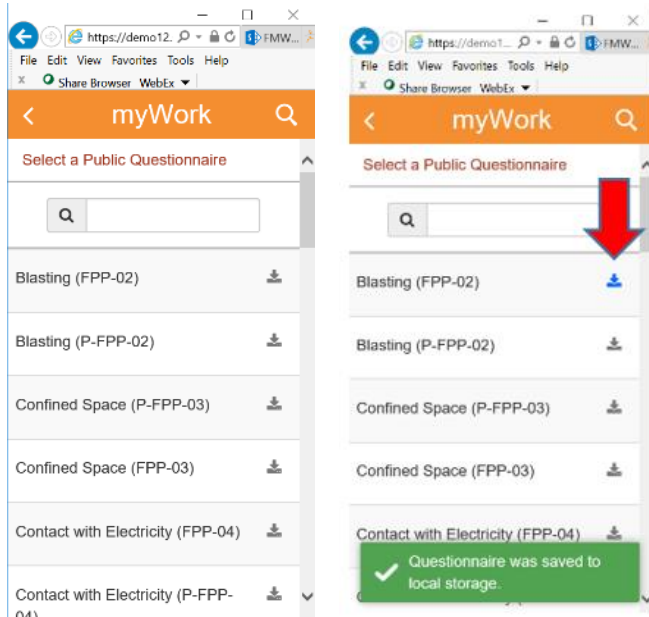

Note: You can download multiple different questionnaires to be filled out offline. However, you can only complete 1 of each different questionnaire you download before you are back online and submit it. You will then need to repeat the download process again to fill out another copy of the same questionnaire the next time you go offline.

SUPERVISOR TALKING POINTS
FATAL RISK MANAGEMENT

Fatal Risk Management expands on the concepts learned in Fatality Prevention, and provides field supervisors and employees with a set of tools to bring conversations about Fatal Risks and Critical Controls to the field. Discussions should focus on understanding what tasks and jobs can get us killed, and what controls can be put in place to prevent serious injury and death. The purpose of Fatal Risk Management is to improve communications in the field and prevent fatalities.

WHEN COMMUNICATING THE PROGRAM TO YOUR CREW:

EXPLAIN THE PURPOSE OF FATAL RISK MANAGEMENT
- Identify fatal risks –**the things that can kill us**– and critical controls –**the things that can prevent death**-
- Use the tools to increase communication and understanding of the risks that we work with, and the controls that are available to us

REVIEW THE TOOLS AVAILABLE
- Icons for each Fatal Risk
- Checklists with Critical Controls for each risk
- Medgate System for tracking

COMMUNICATE YOUR EXPECTATIONS
- Operators should use the icons to identify fatal risks of your tasks
- Operators can reference the critical controls based on the risks to ensure work is performed safely
- Crews can communicate better about fatal risks and critical controls in tailgate meetings and line-outs
- Supervisors will use the checklists to verify critical controls are in place in the field
- Checklists will lead to conversations about better and more effective implementation of controls

IMPORTANT POINTS TO NOTE:

SHOULD NOT CREATE ADDITIONAL WORK
- Icons are quick reference, and can lead to more effective tailgates
- Checklists are not additional work –should replace or integrate with other things we are doing in the field
- No expectation that the checklists will be filled out and turned in by operators

ENCOURAGE CREATIVITY
- Discuss ways the icons and checklists can be used in your area (stickers, posters, magnets, sandwich boards, etc)
- You are a team, and this this your space...make fatal risk management your own in ways that work for you!

IMPLEMENTING THE PROGRAM

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Sample road map for rolling out FRM:

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These are projected timelines for the rollout of each segment:

- Use Supervisor Talking Points to introduce the program
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WEEKS 3-4

These are projected timelines for the rollout of each segment:

- Introduce Critical Control concepts
- Group discussions around Critical Controls

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These are projected timelines for the rollout of each segment:

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- Continue discussions on Fatal Risks, icons, and Critical Controls

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INDEX

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.

Mail to: Mine Training Institute, Attn: Suzanne Anderson, 18550 S. La Canada Dr., Sahuarita, AZ 85629
Scan or email to: sanderso2@fmi.com