FREEPORT-McMoRan

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Monthly Contractor Safety Meeting

April 9, 2019

Morenci Environmental Services

Environmental Share

Dust Management

April 2019

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What: Morenci's Title V Air Quality Permit requires that reasonable precautions are employed to prevent excessive dust from becoming airborne.

Who: All employees and contractors are required to help prevent dust from becoming airborne.

All areas of the mine, including:

- **Blasts**
- **Conveyors**
- **Unpaved Roads, etc.**

When: Any dust is occurring, take necessary action(s) to mitigate immediately.

How:

- Drive to the conditions of the road (15mph when dry/dusty conditions)
- Call for a water truck or water application
- Contact the control room operator and request water application or a water truck
- Manage piles of accumulated dust fines (vacuum or remove it)
- Call or notify Environmental Services Department

Questions? Or need more information call:
Environmental Services 928-865-6000

FREEPORT-McMoRan

POTENTIAL FATAL EVENT ADVISORY

PFE #	PFE – 2018 - 3
IMS #	94759
OPERATION:	Chino
INCIDENT DATE:	1/26/2019
TIME:	11:30 a.m.
TYPE:	Property Damage
PFE Follow-Up:	

Haul Truck and Service Truck Collision

DESCRIPTION / DETAILS OF ADVISORY

Summary: A high-energy event occurred when a loaded haul truck rolled and stopped on top of an unoccupied service truck after the haul truck had been manually started with air following brake work. Both vehicles caught on fire.

Description: A mine maintenance mechanic went to service a loaded haul truck with locked up brakes. Before starting work, a rubber tire dozer placed a dirt chocking berm in front of the driver side front tire. The mechanic then diagnosed the issue and went back to the warehouse for parts.

Later that morning, the mechanic returned to fix the brakes and parked the service truck in front of the chocking berm / haul truck. After completing the job, the mechanic manually started the haul truck with air and instructed the driver to put the gear in reverse to test the brakes. When the driver disengaged the service brake, the truck began to roll forward.

The mechanic, who was about to turn off the air compressor, noticed the truck was rolling and ran out of the way. The haul truck proceeded to roll over the chocking berm and stopped on top of the service vehicle. The haul truck's front bumper struck the air compressor, which caused the service truck and then the haul truck to catch on fire. The driver saw flames from under the cab, activated the fire suppression system and was able to safely dismount the truck. The mechanic's handheld radio was in the service truck – to call a Mayday, the employees ran 3/4 of a mile on the haul road until they found an employee with a radio.

FATAL RISKS

Vehicle Impact to Person	**N/A**

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

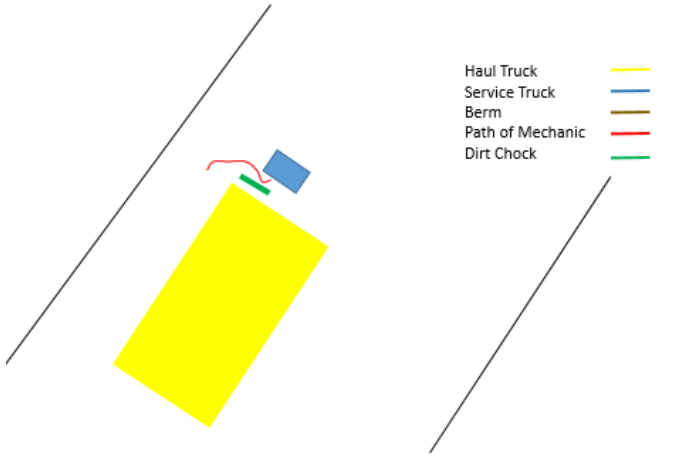
- Inadequate risk assessment to include the energy associated with a haul truck on a grade

ABSENT / INSUFFICIENT CONTROLS CONTRIBUTING TO THE EVENT

- Placement of chocking berm – the berm was 5 feet in front of the tire, a distance that allowed the truck to build up enough momentum to roll over the berm
- Placement and proximity of the service truck to the haul truck
- Method for testing the brakes of a loaded haul truck on a 9 percent downward grade
- Failure to move service truck from work area prior to operating the haul truck

HEALTH AND SAFETY POLICIES	APPLICABLE STANDARDS / POLICIES / PROCEDURES
Mobile Equipment Interaction	

The haul truck on top of the service truck and both vehicles on fire.



An illustration showing the position of the trucks, berms and path of the mechanic.

An aerial view of the haul road and location of the haul truck (yellow rectangle) and service truck (blue rectangle).

This is NOT an investigation report. It is a NOTIFICATION of a Significant advisory, event, occurrence, notice, regulatory action, or recall that requires immediate attention and action(s) at a Freeport-McMoRan operation and is being communicated to enhance safety awareness and information.

FREEPORT-McMoRan

POTENTIAL FATAL EVENT ADVISORY

Near Miss – Molten Matte-filled Ladle and Track Loader

PFE #	**PFE – 2019 - 7**
IMS #	**95273**
OPERATION:	**Miami**
INCIDENT DATE:	**2/14/2019**
TIME:	**1552**
TYPE:	**Near Miss**
PFE Follow-Up:	

Issued By: **Brandon Gilley**

Contact For Additional Details: **928-701-7424**

DESCRIPTION / DETAILS OF ADVISORY

Summary: A track loader operating inside the converter aisle was struck by a molten matte-filled ladle being moved by the overhead crane.

Description: A track loader operator was in the west-end converter aisle filling up a third container with copper- bearing material for remelting. At the same time, an overhead crane operator further down the aisle began to move a fourth ladle of molten matte for transfer into the no. 2 converter. When backing up the crane towards the converter, the ladle struck the right upper corner of the track loader. No molten material was spilled.

The crane operator immediately lowered the ladle to the ground and informed the track loader operator, who was unaware the incident had occurred. The rear end of the loader was facing the crane, and the operator did not feel the bump due to the regular jerky movements of the loader.

FATAL RISKS

Contact with Molten Material	**Lifting Operations**

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

N/A

ABSENT / INSUFFICIENT CONTROLS CONTRIBUTING TO THE EVENT

- Ineffective administrative control – The loader operator followed procedures to contact the crane operator for clearance to enter the converter aisle. However, this administrative control was ineffective by solely relying on employee communication to prevent a dangerous interaction.
- Current procedures allow molten metal transfers to occur while mobile equipment is operating in the aisle.
  - As an immediate corrective action, all ladle transfers of molten matte have been halted when mobile equipment is working in the converter aisle.

HEALTH AND SAFETY POLICIES	APPLICABLE STANDARDS / POLICIES / PROCEDURES
N/A	SOPs: • SM-35-0036: Converter Aisle Protocol for Entering • SM-35-0045: Moving the Crane

Circled in red is the ladle making contact with the track loader.

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FREEPORT-McMoRan

POTENTIAL FATAL EVENT ADVISORY

Switchgear Electric Shock

PFE #	PFE – 2019 - 5
IMS #	95437
OPERATION:	Morenci
INCIDENT DATE:	2/21/2019
TIME:	4:30 p.m.
TYPE:	Injury
PFE Follow-Up:	

Issued By: **Scott Brack** | Contact For Additional Details: **Rob Carter**

DESCRIPTION / DETAILS OF ADVISORY

Summary: A contractor electrician sustained a hand injury after receiving an electric shock while performing switchgear maintenance.

Description: A contractor electrician was at Metcalf SX to perform preventive 4160V switchgear maintenance. Prior to the start of the job, the Hydromet supervisor isolated two breakers to support the contractor's LOTOTO. The contractor electrician tested for zero energy and proceeded to clean the 4160V switchgear. About an hour later, the contractor electrician received an electric shock on the middle finger when it touched a stab in the switchgear box. The stab had become energized after power was restored to the substation feeding the switchgear.

An initial investigation revealed that an unexpected outage on the feeding substation affected the validity of the "Try Out" performed by the contractor. In addition, one of the two switches that had been isolated during LOTOTO was incorrect.

FATAL RISKS

Contact with Electricity	N/A

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

N/A

ABSENT / INSUFFICIENT CONTROLS CONTRIBUTING TO THE EVENT

- Failure to properly perform LOTOTO – specifically, incorrect breaker isolation and invalid "Try Out"
- Electrical prints and one-line drawings were not available in the field
- Failure to communicate the substation power restoration
- Failure to follow SOP requiring the use of ground clusters

HEALTH AND SAFETY POLICIES	APPLICABLE STANDARDS / POLICIES / PROCEDURES
Energy Control (LOTOTO)	

The switchgear.

The pinhole entry and exit point on the glove, which was the appropriate PPE for the work being performed.

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PT FREEPORT INDONESIA

POTENTIAL FATAL EVENT ADVISORY		
	PFE #	PFE – 2019 - 6
	IMS #	95234
	OPERATION:	PTFI
Mobile Crane Contact with Energized Overhead Power Line	INCIDENT DATE:	2/13/2019
	TIME:	1:45 p.m.
	TYPE:	Property Damage
	PFE Follow-Up:	

Issued By: **George Marges** at gmarges@fmi.com

Contact For Additional Details: **Ida Bagus Ardana Putra** at pibardan@fmi.com

DESCRIPTION / DETAILS OF ADVISORY

Summary: A mobile crane came in contact with an energized overhead power line during lifting operations.

Description: A crane operator was using a 45-ton mobile crane to lift and move conveyor belt rolls at the Dewatering Plant. When lowering a used roll to the ground, the steel wire rope of the crane swung and came in contact with an energized 2,400-volt overhead power line. This caused the line to snap and energize the crane structure. The electric current discharged through the outriggers of the crane into the ground. Additionally, the snapped line came in contact with wood and other materials in a nearby bin, starting a fire. The crane operator stepped out of the cabin after seeing other employees running from the area. Nobody was injured during the incident.

FATAL RISKS

Contact with Electricity	**Lifting Operations**

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

N/A

ABSENT / INSUFFICIENT CONTROLS CONTRIBUTING TO THE EVENT

- Failure to conduct proper spotting operation during lift
- Failure to identify fatal risks and use critical controls.
- Inadequate pre-job planning to effectively mitigate risks.

HEALTH AND SAFETY POLICIES	APPLICABLE STANDARDS / POLICIES / PROCEDURES
N/A	

The location of the used conveyor belt roll (far left) after being moved by the crane.

At left, the location of the crane to the overhead power line. At right, the crane's frayed wire rope after coming in contact with the power line.

FREEPORT-McMoRan

POTENTIAL FATAL EVENT ADVISORY

Crush Injury between Two Mobile Equipment Units

PFE #	PFE – 2019 - 4
IMS #	94924
OPERATION:	PT RUCCI
INCIDENT DATE:	2/2/2019
TIME:	01:35
TYPE:	Injury
PFE Follow-Up:	

Issued By: **Chris Zimmer** – czimmer@fmi.com

Contact For Additional Details: **Daniel Simanjuntak –** dsimanju@fmi.com

DESCRIPTION / DETAILS OF ADVISORY

Summary: An employee was injured after being pinched between a concrete mixer truck and a shotcrete sprayer truck at the Grasberg Block Cave underground mine.

Description: The operator of a cement mixer truck was transferring shotcrete to a sprayer truck in an exhaust ventilation tunnel at the Grasberg Block Cave underground mine. When finished, the mixer operator stepped between the two vehicles to secure the transfer chute to the side of the mixer truck. At the same time, the sprayer truck operator raised the jacks on the shotcrete sprayer. This caused the unit to shift backwards, pinching the mixer operator between the two vehicles.

The sprayer truck operator immediately moved the vehicle forward to release the mixer operator. Medical assistance was called and the mixer operator was transported to the hospital for further medical treatment. The employee sustained injuries to the ribs and lungs. An investigation is underway.

FATAL RISKS

Vehicle Impact to Person	N/A

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

N/A

ABSENT / INSUFFICIENT CONTROLS CONTRIBUTING TO THE EVENT

- Cement truck operator entered a pinch point
- Failure to move the cement mixer truck from the work area prior to raising the jacks on the shotcrete truck.

HEALTH AND SAFETY POLICIES	APPLICABLE STANDARDS / POLICIES / PROCEDURES
Mobile Equipment Interaction	• Maxi Jet (shotcrete sprayer truck) Operating Procedure • Transfer of Shotcrete from the Mixer Truck

Circled in red is the location of the employee when pinched between the concrete mixer truck (left) and shotcrete sprayer truck (right).

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FREEPORT-McMoRan

SAFETY ALERT NOTIFICATION

Sierrita Chlorine Release

Safety Alert #	SA – 2019 - 3
IMS #	95104
OPERATION:	Sierrita
INCIDENT DATE:	1/31/2019
TIME:	5:30 a.m.
TYPE:	Near Miss

Issued By: **Cathy Fontes and Chris Viecelli**

Contact For Additional Details: **Cathy Fontes**

INCIDENT DESCRIPTION

Summary: Material incompatibility between a new titanium dump valve and dry chlorine resulted in a chlorine release and fire.

Description: Moly Processing was offloading the contents of the east railcar into chlorinator tank No.1. Approximately 20 minutes into the job, several chlorine sensors inside the Chlorinator Containment building indicated levels had exceeded 1 part per million (ppm). Shortly after, additional sensors inside the building indicated levels had exceeded 10 ppm. Around the same time, a fire ignited near the east railcar offloading station. These events triggered the building's automatic safety devices, and employees initiated the Emergency Action Plan. The building roll-up doors were closed and the railcar was isolated. The fire went out after about 20 seconds when the supply of chlorine was stopped.

An investigation revealed a new titanium dump valve had been installed on the east railcar unloading station approximately two weeks before the incident. Designed for wet chlorine use, the titanium reacted violently with the dry chlorine used at site.

FATAL RISKS	HEALTH AND SAFETY POLICIES
Exposure to Hazardous Substances – Acute	N/A

OTHER SIGNFICANT RISK (specific to site or task not categorized as global)

N/A

PROBABLE DIRECT CAUSES

- Material incompatibility – the titanium dump valve was designed for wet chlorine use and reacted violently to the dry chlorine (<1000 ppm water) used at site. Historically, lined cast-iron dump valves were used that required frequent replacement. To extend equipment life and reduce the risk of employee exposure to chlorine, valve vendor IPT Valves, Pumps and Services recommended switching to Titanium-body Flowserve Durco TSG4 valves.

IMMEDIATE CORRECTIVE ACTION(S)

- Initiated mayday.
- Blocked road adjacent to moly plant and closed main gate to all incoming traffic.
- Set up Cl_2 monitors outside the building and distributed handheld monitors to on-scene safety pros and ERRT members.
- Verified safety systems functioned inside chlorinator building, including auto car closer, auto valve closure, scrubber start up, exhaust fan shutdown and sensor alarms. One roll-up door had to be manually activated.

REQUIRED ACTIONS(S)

- Implement practice to keep building roll-up doors closed with the exception of during rail car movements.
- Review incident with vendor who recommended the titanium valve.
- Change existing labels to read dry chlorine instead of chlorine.
- Review and update the Chlorine Emergency Response Plan.
- Complete and implement RCA actions.

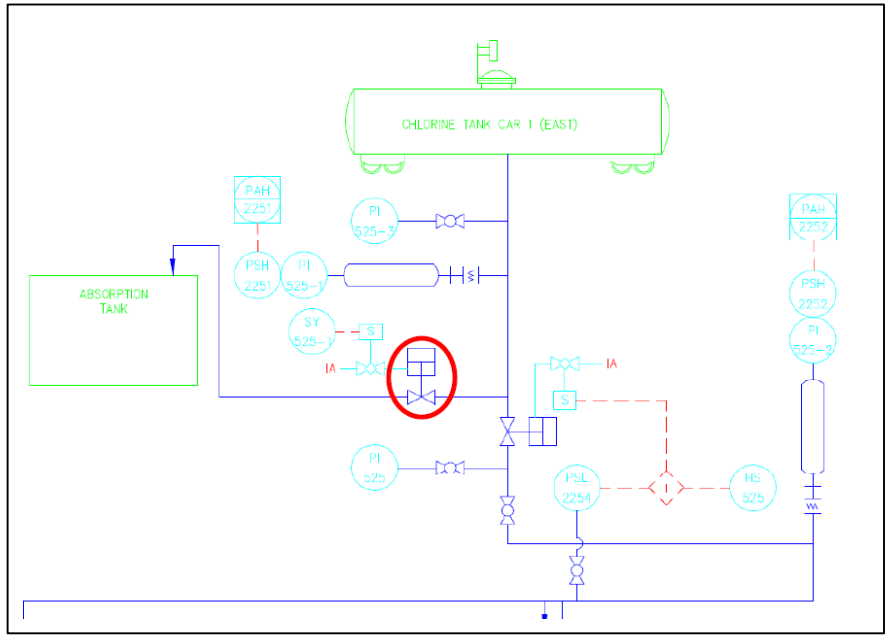

Diagram of the Chlorinator Containment Building. The location of the dump valve is circled in red.

Railcar bay inside chlorinator building.

East railcar at the most intense period of the fire.

Damage to titanium dump valve.

This is NOT an investigation report. It is a NOTIFICATION of a Significant Incident that has taken place at a Freeport-McMoRan operation and is being communicated to enhance safety awareness should a similar situation exist. The information above is a preliminary assessment of the event and is not a formal investigation.

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Questions?

Thank you for attending!

Go Slow to Go Fast…