

Safford Tertiary Crusher Motor Arc Flash	Safety Alert #	SA – 2016 - 8
	IMS #	73464
	OPERATION:	Safford
	INCIDENT DATE:	11/26/2016
	TIME:	9:30pm
	TYPE:	Near Miss
Issued By: John Swagzdis		Contact For Additional Details: jswagzdi@fmi.com

This is NOT an investigation report. It is a NOTIFICATION of a Significant Incident that has taken place at a Freeport-McMoRan location. The information below is a preliminary assessment and not a formal investigation.

INCIDENT DESCRIPTION

On Saturday 11/26/2016 at approximately 9:30pm, Tertiary Crusher #3 (2270CRU003) blew a 4160V fuse at the motor starter. Shift electricians investigated the cause and after testing the motor leads using a Fluke 87 meter they determined there was no issue and replaced the blown fuse. After the fuse replacement was completed, the electricians released the crusher to operations and called for a restart. Upon startup, the A&B phase fuses blew creating a significant arc flash which blew the motor tap box hinged cover open.

Contributing factors to the ground fault (RCA On-going):

The motor for Tertiary Crusher #3 was previously replaced on June 16th, 2016. From the investigation it appears that during replacement, the compression lug on A phase was improperly installed leaving voids. This loose joint allowed minor arcing and heating of the connection to occur causing the insulation to deteriorate ultimately allowing the wire to make contact against the motor junction box steel wall. The second start resulted in a phase to phase fault which most likely created the arc flash that blew the hinge door open as it blew both fuses and had more energy.

During the investigation it was determined that the motor tap boxes on all four tertiary crushers and the two secondary crushers were altered from the original design shortly after commissioning. This modification occurred because the original heavy cast boxes were breaking off the mounting arm due to vibration. The new design wasn't reviewed through the Management of Change (MOC) Process or by an Engineer and doesn't meet industry standards for a 4160 installation, and as a result were not able to adequately contain the arc flash.

GLOBAL SIGNIFICANT RISKS(if applicable)

Electrical Arc Flash	Choose an item.
Choose an item.	Choose an item.

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

- Failure to utilize the MOC process

PROBABLE DIRECT CAUSES

- Improper Installation of the compression lug on the motor lead

IMMEDIATE CORRECTIVE ACTION(S)

- Test motor and replace faulty compression lug
- Repair current motor tap box
- Communicate finding with electrical team and proper motor testing methods using a 5kV megger.
- Flag off area perimeter around motor junction boxes and require LOTOTO to enter until permanent repair is made.

REQUIRED ACTIONS(S)

- Complete RCA
- Develop protocol for testing motors when they fault on overcurrent or ground fault conditions
- Communicate the need to have installations approved by engineering and following the formal MOC process
- Work with OEM to purchase and install original or approved alternative tap boxes and submit through the MOC process
- Ensure protection relay settings are correct for ground fault protection



Motor tap box after arc flash



Mounting location for motor tap box



Compression lug connection



Deteriorated Insulation