Department of Health & Safety Guideline	GUIDELINE NO.	FCX - 12
	REVISION NO.	2
	SUPERSEDE	1 (8/2/11)
HDPE Pipe Handling Guidelines	TASK CLASSIFICATION	Highly Critical / Critical / Non-Critical
APPROVAL DATE – 5/7/12	**ORIGINAL DATE** – 4/08/11	**RELEVANT SOPS** – SITE SPECIFIC

1. Background

In 2010, a Freeport contractor working in the mine was installing a section of 24-inch HDPE pipe. An existing 24-inch pipe was being used as a skid to guide the new pipe into position with the new pipe riding on top of the existing pipe. The contractor was helping to pull the pipe back to the ground using lifting straps, placing him less than 4-feet away from the pipe being moved and directly in the pipe's path of movement. The pipe impacted the contractor in the upper body. He suffered fatal injuries.

Also in 2010, employees were fusing 12-inch HDPE pipe to tie into an existing line. While positioning the pipe for fusion, the stored energy created during the pulling and bending of the pipe resulted in the 12-inch pipe suddenly being projected over the stationary pipeline towards the employee who was standing between a piece of equipment and the stationary pipe. The pipe struck the employee in the face and head causing serious injuries.

As a result of these and other serious incidents with HDPE pipe, a team developed these important guidelines to prevent a similar event from occurring.

2. Purpose and Scope

This guideline applies to all Freeport-McMoRan employees and contractors who handle High Density Polyethylene (HDPE) pipe.

3. Definitions

- HDPE Pipe Handling Permit (Appendix A) – a permit that is required for all work with HDPE pipe 3" in diameter or larger and greater than 50 feet in length where pipe will be pulled, installed, and/or repaired. The permit is not required for off-loading of pipe. The permit is good for the task duration as long as conditions don't change (i.e. weather, equipment, pipe size, terrain, slope, etc.). One permit may be used for multiple jobs that are the same. The permit must be reviewed each time prior to work beginning. If conditions change at any time, a review of the permit is required, which may result in a new permit needing issued.
- Exemption Form (Appendix B) – used when work falls outside of the guidelines listed here. An exemption requires an engineering review of the work to be performed and a manager approval prior to beginning the work. An exemption may be used each time the task is performed as long as the conditions haven't changed (i.e. the equipment utilized, pipe size, terrain or slope are different, etc.). Exemptions that affect all sites will be reviewed by the PSST for possible addition to this guideline.
- Pipe Safety Steering Team (PSST) – a team comprised of representatives from each

area/site affected by this guideline. A company PSST oversees the guidelines for each FCX business unit and a site PSST ensures practices are being followed for each site.

- Project Lead – a person that is intimately familiar with the task. This could be a supervisor, engineer leading the project, or other qualified person.
- Qualified Person – a person that has demonstrated competence according to the skills assessment and has documented training.
- Safety Watch – a qualified person that is assigned to monitor a task and stop work if people place themselves in a potential line of fire. The site will determine if a safety watch is needed for a task based on the risk assessment for that task. If the safety watch is necessary, the person **must remain on the job at all times and have no other job assignments or responsibilities.** If this person must leave the area, there will be positive relief by another qualified person.
- Spotter – a person assigned to assist or direct flow of work for someone performing a task such as unloading or moving pipe.
- Substantial Barrier – an object placed between the pipe and personnel that is able to withstand the force of a pipe to prevent personnel from being struck. Examples may include: dirt berms, concrete barriers, properly placed equipment, etc.

4. Risk Management

Tasks involving HDPE pipe handling will be listed on each site's risk register and an evaluation to reduce or eliminate risk will be completed according to the FCX Risk Matrix. The following guidelines will also be followed by each site.

- An HDPE Pipe Permit (See Appendix A) will be completed for any work with HDPE 3" in diameter or larger and greater than 50 feet in length where pipe will be pulled, installed, and/or repaired. Refer to the Definitions section (Section 3) for further details on permit requirements.
- An evaluation will be completed as part of the permit process to determine if a task requires a designated safety watch. If required, the safety watch must remain on the job at all times and have no other job assignments or responsibilities. If a person must leave the area, there must be positive relief with another qualified person.
- A load/move chart for each piece of equipment will be used to assist decisions for safe handling of pipe. This will include site-specific equipment used for pipe handling.
- An engineering review will be completed to determine if substantial barriers are needed and ensure they are adequate to protect workers in the area.
- Pulling of HDPE pipe will be used over pushing unless an exemption is approved (See Appendix B).
- A Preventative Maintenance (PM) will be established for inspection of pipes utilizing the site's existing PM process. Inspections shall be performed for issues such as sagging, ground erosion, etc. as well as for condition of equipment used for pipe handling (bullets, slings, shackles, etc.).

5. Training

All employees and contractors who handle or participate in the handling of HDPE pipe will

receive specific training on the hazards associated with HDPE pipe. Employees will be trained to effectively complete and use the HDPE Pipe Permit.

Sites will utilize site specific training as well as the skills assessments developed by the PSST to evaluate individuals and verify competency prior to working with HDPE pipe. The skills shall include safe operation of equipment and hazard identification and control procedures. Training will be interactive and consist of classroom, video, and/or field demonstration of the task. Employees must demonstrate competency (verbal and visual) to assess understanding. All training will be documented and a training matrix with employee skills will be kept within the division.

At a minimum the training will include these key elements:

- Use of the HDPE Pipe Permit.
- Determination of safe distances to position employees from pipe during movement or after movement and proper use of substantial barriers.
- Review by a qualified individual of piping that is found to contain residue or solution.
- Specific rigging task training for pipe handling and pulling.
- Off-loading, loading, and storage of HDPE pipe.
- HDPE pipe pulling and handling.
- Fusing HDPE pipe.
- Inspections of pipe and prevention of hazards and failures.
- Incident review and potential hazards and problem areas.
- Mobile equipment used for HDPE pipe handling.

Safety skill assessments developed by the PSST will be utilized to qualify individuals to train/mentor others, perform tasks and complete permits for the following key areas:

- HDPE Pipe Handling Guidelines
- HDPE Pipe Handling Permit
- General Equipment HDPE Pipe Handling
- General Pipe Selection and Identification
- HDPE Pipe Unloading, Loading, and Storage
- Pulling Pipe
- Rigging Equipment
- Pipeline PM and Inspection
- HDPE Pipe Unrolling
- Flow Isolation and Distribution
- Fusing and Fusing Equipment

Existing site documents and skill assessment formats may be utilized, but must include the skills listed in the FCX safety skill assessments.

6. Receiving, Off-Loading, and Storage

Each site will establish Safe Operating Procedures (SOP's) for receiving, off-loading, and storage of HDPE pipe to ensure that:

- A load inspection checklist has been completed to verify the load has been shipped according to company shipping requirements. These requirements are

located in the HDPE Pipe Shipping Requirements document.

- An HDPE Pipe Unloading Checklist (See Appendix D) is completed for loading or off- loading prior to beginning the task.
- A 50-foot safe zone around the truck is established and marked, and a safety watch is in place to keep people out of the unloading/loading zone. The truck driver will remain with the safety watch until the off-loading is complete.
- Site trucks/trailers used to move pipe sticks are equipped with engineered stints or other engineered means of securing the load.
- Barriers or other means of preventing a line of fire issue are in place when un-strapping a load, such as using a loader with forks to block the load.
- The site must ensure that equipment has been evaluated to ensure adequate lifting capacity and that the person operating the equipment is aware of the limitations.
- Employees have documented task training to safely operate equipment mused in loading/unloading pipe under the existing task training process.
- Employees unloading pipe have completed documented rigging task training where a mobile crane is used.
- Employees handling pipe have documented pipe handling task training.
- Receiving or warehouse personnel coordinate the safe arrival of the shipping truck with the operations employees, and trucks will **not** be off-loaded until proper loading is verified utilizing the Freeport-McMoRan loading guidelines and the Load Inspection Checklist (Appendix D). If a truck is not loaded properly, the load will be rejected or an exemption and engineering review will be completed prior to off-loading.
- A signed copy of the Load Inspection Checklist will be sent with the driver and presented to operations employees (or persons unloading) prior to unloading.
- HDPE pipe is stored no more than two pipes high for 10” diameter or larger pipe, and no more than two feet for smaller diameter pipe, unless there are engineering controls in place to control the possibility of a stack collapsing.

7. Pulling/Moving Lengths of Pipe

- An HDPE Pipe Permit will be completed prior to pulling/moving pipe.
- Each site will establish SOP’s for pulling/moving of HDPE pipe.
- All equipment used for pipe pulling/moving will meet the load specifications in Appendix C or an exemption approval is required.
- For 12” diameter pipe and larger, the site shall use pipe rigging as outlined in Appendix C. If the rigging is not listed in Appendix C, an exemption is required. Rigging and pulling procedures for pipe less than 12” diameter will be defined in site SOP’s.
- For pulling or moving pipe less than 12” diameter and longer than 400 feet in length, an engineering review must be conducted and safe practices must be written into that SOP.
- The use of a sling as a “choker” is **NOT** acceptable for pulling/moving an HDPE pipeline of a diameter 12” or larger unless an exemption is approved. This includes pulling lengths of pipeline while fusing in a fusing lay down area. It is however, acceptable to use a sling to lift and position pipe (i.e. positioning a pipeline in a fusing machine or removing it from the fusing machine).

- Pipe-slotting, or cutting a slot or shape in the pipeline, to be used as an anchor point for pulling/moving an HDPE pipeline of a diameter 12" or larger is **NOT** acceptable unless an exemption is approved. Approved equipment for pulling is listed in Appendix C.
- All ground personnel must be positioned out of the line of fire when pipe is being pulled or moved. If the minimum distance of 50 feet cannot be met, then substantial barriers must be utilized.
- Safety watchers and blockers will be established for pulling/moving of pipe on haul roads or where there is potential for interaction with other traffic as determined by risk assessment of the task.
- HDPE pipe pulls will **NOT** exceed grades greater than 17.5% without an approved exemption.
- Escorts and trailing vehicles must be used if pipe pulling occurs in active mining areas. Scheduling and communication of pipe movement activities must be completed.
- Equipment used to guide the pipe must be appropriate for the size and potential energy of the pipe as determined by Appendix C and/or an engineering review.
- Pipe bending creates additional stored energy that must be considered when completing tasks to ensure that minimum safe distances are determined, substantial barriers are provided where needed, and appropriate equipment is selected.

8. Installation and Repair

- Sites will prepare SOP's for installation and repair jobs with HDPE pipe.
- An HDPE Pipe Permit will be completed prior to beginning pipe installation and/or repair by a qualified person.
- A pre-job safety review meeting will be completed with all employees involved in the task.
- For new installations, an engineering review will be conducted to evaluate pipe placement and site logistics.
- A Management of Change (MOC) evaluation is required for any new installation or significant modification to a pipe system, as outlined in the site MOC.
- A qualified person must review tasks involving cutting pipe with significant bends. A pre- job safety meeting will also be held to discuss hazards and precautions, and to determine safe distances, substantial barriers, and adequate equipment to perform the task safely.
- Dual-contained or dual-walled pipe may require different rigging specific to the pipe and task. An exemption and engineering review is required for these tasks.
- Sites that handle HDPE pipe in coils will develop SOP's for all tasks involving coiled Pipe (i.e. unrolling coils) and issue a permit (Appendix A) prior to conducting the work.
- It is important to remember that banding clamps are **not** designed to splice the ends of two pipes together, and cannot prevent axial pipe movement. These pipes should be fused or secured with a coupling designed for this application.

9. Monitoring and Control

The company Pipe Safety Steering Team (PSST) will evaluate existing standards, set new guidelines, and monitor site performance.

The company PSST will consist of:

- Sponsor; Manager, GM or Director Level
- Lead; Superintendent or Manager Level
- Site Champions
- Global Sourcing Representative
- Health and Safety Representative
- Engineering Representative
- Training Representative

The company PSST will conduct regular audits at each branch to monitor compliance, look for best practices, and provide feedback for improvement. Audits will include review of compliance with corporate guidelines, training, SOP's, and field practices.

Quarterly meetings will be held with all members to review practices and make recommendations for change where needed. Changes to the current guidelines and appendices must go through a formal approval process with the company PSST and be brought back to the site PSST for implementation.

Sites that regularly handle HDPE pipe will establish a PSST with:

- The Site Champion (Member of Company PSST)
- Engineering Representative
- GSC Representative
- Health and Safety Representative
- Representative from Each Affected Area

Sites that handle HDPE pipe on a minimal basis or as part of short duration projects will utilize expertise from other sites to assist with review of the project and implementation of the guidelines prior to work commencing.

Supervisors at each site will be responsible to ensure that practices are being followed on a daily basis. Monthly audits of pipe handling practices will be completed for compliance and identification of improvement opportunities. Sites will audit work practices of contractors that perform HDPE pipe work to ensure compliance with site HDPE pipe procedures and this guideline.

Pipe handling management will be part of each site's risk assessments, ISO, and OHSAS processes as applicable. Records will be maintained at each site for reference in audits.

Records of all completed forms will be maintained in the area of responsibility for a period of one year.