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Morenci Safe Production Standard	Standard 2.12	
	OHSAS 18001:2007	4.4.6
Rigging Equipment, Material Handling & Hoisting	Revision #	03
	Revision Date	06/24/2013
	Effective Date	April 30 th 2012
	Standard Owner	Technical Training Department
Approvals:		
Senior VP Morenci Operations: 03/30/2012		Safety Steering Committee: 03/30/2012

1.0 PURPOSE

Hoisting and rigging refers to the use of mechanical devices to move, lift, and adjust loads. The objective of this standard is to protect personnel from injury, the environment from harm, and equipment and property from damage while rigging, hoisting and handling these loads. Using rigging improperly or using inadequate rigging has the potential to result in catastrophic events. To prevent such events from occurring, minimum requirements have been established through this standard to eliminate or reduce risks associated with rigging, material handling and hoisting.

2.0 SCOPE

All Freeport-McMoRan employees and contractors shall meet or exceed the minimum requirements established by this standard. This standard applies to rigging materials used in conjunction with material handling equipment for the movement or adjustment of objects by hoisting.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

- 3.1 Bird caging:** The separation or unraveling of the construction strands within a wire rope sling.
- 3.2 Excessive Usage:** Operates at
- 3.3 Kink:** A bend or fold in a steel wire rope that leaves permanent distortion.
- 3.4 Strand:** An element of the construction of a wire rope of fabric, i.e. a single wire within a wire rope or a braid within a fabric belt.
- 3.5 Choker:** The wrapping of a lifting sling around a load which causes tightening on the load as the load is lifted.

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- 3.6 Lifting Eye:** The “eye” portion of a lifting sling used to attach the sling to loads or lifting attachments.
- 3.7 Safe Working Load:** The maximum load which may be applied to a crane, hoist, rope, chain or sling for particular conditions and use.
- 3.8 Below the Hook Lifting Device:** a device, other than slings, hooks, rigging, hardware and lifting attachments, used for attaching loads to a hoist.
- 3.9 Critical Lift:** See definition within Standard.
- 3.10 Personnel Hoisting:** As determined by this standard, refers to any hoisting of persons using a lifting basket that is connected to a primary crane line.
- 3.11 Competent Person:** An individual designated by Freeport-McMoRan to be responsible for oversight, implementation, and monitoring of any applicable policies, regulations and procedures. A competent person’s training and knowledge makes them capable of identifying, evaluating, and addressing existing and/or potential hazards and who has the authority to take prompt corrective action in regard to such hazards.
- 3.12 Hitch:** The manner of attachment of a sling to a load and lifting device (*Refer to manufacturer information when determining hitching methods and capacities*)
- **Basket Hitch:** A sling attached from the hook or lifting device under the load and back to the hook or lifting device.
 - **Vertical Hitch:** A sling attached from the hook or lifting device directly to the object being lifted.
 - **Chocker Hitch:** A sling attached around a load and back to itself through the loop, thimble or utilizing a connector
- 3.13 Qualified Crane Operator:** An employee who has been through and completed an approved training course (covering, at a minimum, applicable aspects of crane use, operation, technical rigging and inspection). Whenever there is any doubt as to safety, the operator shall have the authority to stop and refuse to handle loads until the risk of the task has been reduced to an acceptable level.
- 3.14 Qualified Rigger:** An employee who has been properly trained and deemed competent in applicable aspects of rigging use, selection, and inspection to include calculation of loads to be lifted. The rigger(s) will inspect all lifting components and rigging prior to the lift being made for compliance with this standard and manufacturer specifications.
- 3.15 Rigging:** The process of safely attaching a load to a hook or lifting device by means of adequately rated and properly applied slings and related hardware.
- 3.16 Rigging Hardware:** This hardware includes shackles, links, rings, swivels, turnbuckles, spreader bars, eyebolts, and hoist rings. (The use of non-engineered “homemade” rigging hardware is prohibited.)

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- 3.17 Slings:** Engineered wire ropes, chains, synthetic web, and metal mesh constructed and designed for material handling.
- 3.18 Tag Line:** A substantial line used to assist with movement of a load and attached in a manner that prevents personnel from being exposed to a suspended load hazard.
- 3.19 Lift Plan:** The pre-planning, identification of hazards implementation of control measures and documentation completed prior to the lift taking place.

4.0 RESPONSIBILITIES

- 4.1 Supervisors** will ensure that their employees understand and follow this standard, including ascertaining training on the use and care of rigging equipment and material. They will ensure this standard is implemented in their area of responsibility. This includes:
 - i. Ensuring that inspections are conducted and that lifting gear inspection records are made available and maintained;
 - ii. Ensuring that competent personnel are available for equipment inspection.
 - iii. Ensuring that slings are stored in accordance with manufacturer requirements.
 - iv. Advising crews on the load limits of lifting slings and correcting unsafe conditions/practices associated with rigging and material handling.
 - v. Ensuring that the damaged/defected lifting equipment are either destroyed or repaired by the appropriate institutions.
- 4.2 Employees** (Riggers, Operators, etc.) will follow this standard and notify their supervisor of any situations that do not comply with this standard.
 - i. Only use rigging with current inspection tags.
 - ii. Understand the limits of the load to be lifted and the proper size rigging to use.
 - iii. Utilize proper rigging techniques.
 - iv. Visually inspect rigging before and after use and ensure that slings in use do not have any obvious defects that affect safety
 - v. All defects shall be reported to the supervisor and/or relevant party immediately.
 - vi. Do not operate lifting equipment without proper training or qualifications.
- 4.3 Management** will provide resources and training for supervisors and employees to comply with this standard.

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- 4.4 Health and Safety Manager** will enforce safety in relation to rigging, material handling and hoisting and will audit against this standard.
- 4.5 Training Department Manager** will develop modules and implement new employee training and refresher training as required relevant to this standard.
 - a. Ensure Morenci has its own Standard to regulate lifting gear and review the standard as needed.
 - b. Maintain training documents and records.
- 4.6 Project Managers** will ensure that contractors and employees are informed of the standard and understand the requirements needed to comply with the standard. In addition they shall be responsible for the overall implementation of this standard as it relates to special projects under their immediate control.

5.0 STANDARDS OF PERFORMANCE

Only properly trained employees will select and inspect rigging equipment used for lifting in accordance with this standard.

- 5.1** All lifting gear, including machines and tackle, shall be of good construction, in working order and comply with relevant standards. The design/hardware requirements contained in this document are applicable to new lifting devices/equipment purchased after 6 months from the issue date of this document. Existing equipment and that purchased during the first 6 months from issue of this document shall be reviewed for compliance with all design/hardware aspects of this standard within 12 months of its issue and the need to update such equipment shall be evaluated.
- 5.2** Lifting slings shall be suitable in size and construction for the material they are used to lift.

When selecting a lifting sling, consideration shall be given to:

- a. The weight and shape of the load to be lifted
 - b. How the sling will be rigged to the load
 - c. The stability of the load to be lifted
-
- 5.3** Lifting components such as Eye-bolts, clevises, pad eyes, anchor points and in the field fabricated lifting lugs must be designed by a qualified individual and installed in accordance with manufacturer specifications. Where rigging components are exposed to excessive wear, usage or repetitive hazardous environmental conditions; a formal annual inspection program must be developed which includes:

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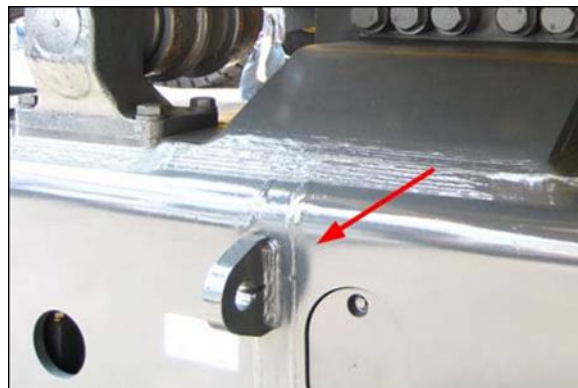
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1. An evaluation of the rigging hardware by a competent person
2. Where defects are found that indicates potential damage to the internal structure of a lifting component; a non-destructive (magnetic particle, dye-penetrant and/or x-ray analysis) test shall be performed.
3. Documentation of the test shall be retained by the division for the life cycle of the rigging component.

If defects are found that affect safety the component shall be removed from service and either destroyed or repaired under the direction of the manufacturer and the FMMO plant engineering department.

- 5.4 The placement, positioning and welding of lifting lugs shall be done in accordance with engineered design drawings (internal or manufacturer generated) and the criteria in **appendix 8.1**. The welding shall be conducted by an experienced competent welder familiar with the type of metal and techniques which apply (i.e. Flat Plate Welding, Pipe Welding)



- 5.5 All rigging shall be clearly marked with the Safe Working Load (SWL) capacity on the rigging device and a serial/registration number for individual identification.
- a. All slings shall have a tag attached that identifies the capacity of that particular sling.
 - b. Lifting hardware capacities must be known and available for review but do not necessarily need to be stamped into the equipment.
- 5.6 All rigging shall be inspected annually and before each use. In order to ensure every rigging component is properly inspected by competent persons, the following steps shall apply:

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- a. A competent person shall be designated as the rigging Inspector and shall be responsible for conducting the inspection of all lifting equipment and machinery within the applicable area.
 - i. The inspection date, name and signature of the inspector shall be placed in the register on completion of each scheduled inspection.
 - ii. A means of identification suitable for review, shall be attached to the sling which can be referenced back to the Lifting Register, showing that the inspection has been completed.
 - b. Slings that are damaged or deemed unsafe to use shall be removed from service immediately and tagged with an “out of service” tag or destroyed.
- 5.7** Taglines shall be attached to loads which need to be guided, steadied or manipulated while suspended. The tagline shall be of sufficient strength to restrain the load and long enough to prevent exposure to suspended loads. Where needed, multiple tag lines shall be used, to prevent personnel from walking underneath loads or exposing them to safe access/fall of person hazards.
- 5.8** Rigging equipment shall not be loaded in excess of its recommended rated load capacity.
- 5.9** Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees. *(For storage requirements refer to section 5.12)*
- 5.10** All hooks fitted to lifting gear shall be equipped with a functioning safety latch to prevent accidental disconnection of the load.
 - a. Exception: Lifting slings and equipment that is supplied by the manufacturer and designed without safety latches/catches can be used on approved specific applications.
- 5.11** All lifting hooks fitted to lifting gear and equipment shall not have heat applied by welding, pre-heating, grinding or any other form of heating. These hooks shall not be repaired, aside from the replacement of the safety latch/catch, where fitted.

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5.12 Rigging equipment used for lifting shall not be used for towing. Towing equipment must be identified as such and designed for the equipment being towed. Slings assembled with wire rope clips shall not be used for hoisting.

5.13 Specific Requirements

a. Working under loads

Under no circumstances will any worker be allowed to enter the area underneath a load while it is suspended in the air unless the suspended equipment is effectively blocked against inadvertent hazardous motion or the operation meets the requirements outlined in Appendix 8.4.

b. Stabilizing a load

Employees may stand beside a suspended load and guide it into place with their hands when, in view of the height of the load, actual and potential swing of the load and trip hazards, the employees are not at risk of being struck by the load if it were to fall.

c. Environmental Conditions

Slings and rigging shall be stored appropriately and away from incompatible substances as specified by the product manufacturer. Lifting gear shall be stored in an orderly and clean location designed for the storage of lifting gear. Lifting gear shall not be left on the floor in working areas.

- The lifting gear shall not be stored with fuels, oils and grease.
- Synthetic fiber slings shall be stored away from direct sunlight to prevent Ultra Violet (UV) damage.

d. Wire rope

- i. Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Wire rope shall not be secured by knots.
- ii. Safe operating temperatures: Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 °F. When non-fiber core wire rope slings of any grade are used at temperatures above 400 °F or below minus 60 °F, recommendations of the sling manufacturer regarding use at that temperature shall be followed.

e. Synthetic webbing (nylon, Kevlar, polyester, and polypropylene)

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- i. Each synthetic web sling shall be marked or coded to show:
 - Name or trademark of manufacturer
 - Rated capacities for the type of hitch
 - Type of material
 - ii. Fittings attached to synthetic slings shall be:
 - Of a minimum breaking strength equal to that of the sling; and
 - Free of all sharp edges that could, in any way, damage the webbing
 - iii. Safe operating temperatures: Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180 °F. Polypropylene web slings shall not be used at temperatures in excess of 200 °F.
- f. Alloy Chain Slings
- a. All chains used for rigging shall be made of alloy steel.
 - b. Chain type come-a-longs are included in this category.
- g. Below the Hook Lifting Devices
- Structural and mechanical below-the-hook lifting devices shall be designed by a qualified individual and provided with identification displaying the following data, as a minimum:
- I. rated load
 - II. manufacturer's name (contractor's name if fabricated onsite)
 - III. lifting device weight (if over 100 lbs)
 - IV. drawing number (if applicable)
 - V. serial number (if applicable).

The identification data may be displayed on a name tag, nameplate, metal stamp, or other permanent marker.

Note: If the lifting device of several components that can be detached from the assembly, these individual lifting devices shall be marked with their individual load rating also.

When below the hook lifting devices or other specialized rigging components are purchased or designed in house, clear instructions shall be provided to the designer and fabricator detailing:

1. A description of the intended function of the rigging device

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2. Method of rigging attachment to the load and/or hosting apparatus
3. Intended duty cycle of the device including any known hazardous environmental conditions
4. The desired load capacity of the unit and heaviest load that will be handled

(Refer to the Morenci Operations Below-the-Hook Lifting Device standard for more detailed information)

h. Critical Lift

Prior to making any Critical Lift, a documented Critical Lift Plan must be developed and adhered to throughout the duration of the lift (See *appendix 1* for Critical Lift Permit).

A critical lift means any lift that meets one or more of the following characteristics:

1. Exceeds 75 percent of the rated capacity of the crane
2. Requires the use of more than one crane
3. The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility or project
4. The lifting of personnel with a crane
5. Lifts where personnel are required to work under a suspended load

The Critical Lift Plan will include the following:

1. Determining the maximum weight of the equipment or device that is to be lifted to include any fluids contained therein, sediment, or foreign material build up on the device or equipment
2. Selecting the rigging based on determining the maximum weight
3. Calculating the combined weight of the load, all rigging equipment, load blocks and/or jibs
4. Determining the required boom angle and swing radius
5. Selection of the proper crane or cranes for the lift
6. Inspecting the lift site for soil conditions and any other hazards
7. Determine the area to be restricted during the lifting process
8. Equipment operator or operators to include the designated signal person
9. Completion and review of all documentation and forms to include signatures prior to the actual lift proceeding
10. Designation of who will be the qualified rigger for the lift and their respective signatures on the documentation.

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11. Review of the lift plan with all affected personnel prior to the lift. If there is anything questionable or a concern prior to or during the lift the project supervisor shall immediately inform safety and management to help address those concerns.

6.0 REFERENCE DOCUMENTS

- 6.1 Mine Safety and Health Administration (MSHA) Regulations: 56.16007
- 6.2 Occupational Safety and Health Administration (OSHA) Regulations: 1910.176, 1910.179, 1910.180, 1926.251, 1926.554, 1926.400, 1936.1438, 1926.1501
- 6.3 Department of Energy standard: DOE-STD-1090-2007
- 6.4 American Society of Mechanical Engineers (ASME): B30.2, B30.5, B30.9, B30.10, B30.16 B30.20, B30.21, B30.23, B30.26

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Original Document of this Standard	Health and Safety	Permanent
Training Certificates	Training Department	Duration of employment + 10 years
Rigging Inspection Records (Annual Inspections and Non-Destructive Tests)	Division / Area	Life of units + 10 years
Critical Lift Permit	Division / Area	10 years

8.0 APPENDICES

- 8.1 Welding Lifting Lugs
- 8.2 HS-SPS-2.12-001 - Critical Lift Permit

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8.3 FMMO Alternative Safety Requirements for Suspended Load Operations

8.4 HS-SPS-2.12-002 - Rigging Inspection Form

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

<i>Description of Changes to this Document</i>
Prior to distribution – Changed # of Standard to match table of contents in website – Removed MP from OHSAS Reference - The above changes are minor administrative changes and do not affect the process/procedure. The changes were made prior to initial distribution not requiring re-approval therefore the Revision # remains 00 – S. Elias 04/04/2012
Modified lifting lug welding and configuration requirements based on feedback from subject matter experts – BL 6/7/2012
Included form Numbers for Appendix 8.2 and Appendix 8.4 – S. Elias 8/20/2012
Modified Critical Lift definition to meet OSHA requirements, based on employee feedback – BL 9/4/2012
Updated Records Table – S. Elias 06/24/2013 Rev. 03

Appendix 8.1 - Welding Lifting Lugs

General

These guidance notes are the minimum requirements that must be adhered to during the process of welding lifting lugs to material that is to be lifted.

Purpose

The purpose of the lifting lug is to provide safe, strong lifting points from which lifting and material handling equipment can be safely attached for the purpose of transferring equipment from one location to another.

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Safety Considerations

The following should be considered:

- i. The incorrect use of welding rods/electrodes or poor welds will result in failure of the weld and the lift;
- ii. An engineered design (welding procedure) shall be obtained and the details of the design adhered to during all in the field lifting lug installations.
- iii. All welding surfaces shall be properly prepared;
- iv. Use of certified welder(s) who have a minimum qualification, as detailed below:
 1. Flat Plate Welding – Qualification
 2. Pipe Welding – Qualification
- v. Employees shall wear the correct PPE at all times.
- vi. A safe means of access and protection from suspended loads shall be maintained at all times (including the correct use of taglines)

#	Stage / Step	Action / Key Points
1.	Preparation and Planning: <ul style="list-style-type: none"> • Preheat material to required temperature; • Cover with welding blanket for slow cooling. 	<ul style="list-style-type: none"> • Special care shall be taken to ensure correct welding rod is used, the correct capacity lifting lug is identified and the weld is of high quality to sustain the load. • Use appropriate PPE and conduct workplace examination prior to welding
2.	Lifting Lug Design	<ul style="list-style-type: none"> • All Lifting Lugs shall be manufactured from the correct gauge and grade of steel required by the installation type.
3.	Preparing the Welding Surface: <ul style="list-style-type: none"> • Grind surface area; • Preheat and weld; • Cover with asbestos blanket for slow cooling; • Conduct crack tests where necessary using dyes penetrates to detect cracks. 	<ul style="list-style-type: none"> • All surfaces shall be prepared, all contaminates and corrosion shall be removed; • Edge preparation of material for fillet weld should be performed prior to weld; • Preheat the material to take chill from steel of any thickness more than 10 mm. • When temperature is less than 10 degrees C, all steels shall be preheated.
4.	Welding Lifting Lugs on Manganese: <ul style="list-style-type: none"> • All welding on Manganese shall be with a Weld; Electrode is to be conducted on a flat surface (Down hand weld position). 	<ul style="list-style-type: none"> • When welding Grade 250 Steel Lifting Lugs to Manganese Stainless Steel Rods shall be used; • All Lifting Lugs shall be welded parallel to the direction of the lift; • All Lifting Lugs shall be correctly positioned to ensure the distribution of weight of the lift evenly.

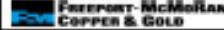
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<p>5.</p>	<p>Welding Lifting Lugs to Mild Steel and Alloy:</p> <ul style="list-style-type: none"> • Grind edge for Surface preparation and grind Lifting Lugs; • Preheat location and weld; • Cover with blanket when finished; Allow to cool slowly; • Conduct crack tests where necessary using dye penetrates to detect cracks. 	<ul style="list-style-type: none"> • When welding Grade 250 Steel Lifting Lugs to Mild Steel and alloy, only Low Hydrogen Rod shall be used and / or as Manufacturer advises; • All Lifting Lugs shall be welded parallel to the direction of the lift; • All Lifting Lugs shall be correctly positioned to ensure the distribution of weight of the lift evenly.
<p>7.</p>	<p>Notes:</p>	<ul style="list-style-type: none"> • The Lifting Lug calculation to determine conformance with specification AWS E-70, series electrode for structural steel, floor plate and grating. Welding shall conform to AWS D1.1 specification. Use the general guideline of ANSI/ AWS A5.01, filler Metal Procurement Guidelines. • A minimum Safety Factor of 2 has been selected to cover a variety of conditions, e.g. welding position, weld quality etc.; • All lifting lugs shall be welded parallel to the direction of the lift;

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Appendix 8.2 – SNAPSHOT OF CRITICAL LIFT PERMIT

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 FMMO Critical Lift Permit (HS-SP5-2.12-001) Rev 01.		
Operator:		Date:
Crane #(s):	Crane Type(s):	Max Crane Capacity at Current Configuration:
PICK-UP/SET-DOWN DATA		
Lift Description (include why this is considered a critical lift):		
Lift Data		
Main Boom <input type="checkbox"/>	Manual Extension <input type="checkbox"/>	Jib Extension <input type="checkbox"/>
Load Radius (feet) =		
Max Boom Length (feet) =		
Max Boom Angle =		
Using Main Block or Auxilliary?		
Gross Load		
Jib or Extension:		Weights
Stowed <input type="checkbox"/>	Erected <input type="checkbox"/>	
Net Load (lbs) =		
Rigging (lbs) =		
Main Block (lbs) =		
Headache Ball (lbs) =		
Aux. Boom Head (lbs) =		
Wire Rope (lbs) =		
Other (example: fluids, sediment, solid material build-up) (lbs) =		
Total Gross Load =		
Was Appropriate Rigging Selected? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Gross (Boom) Capacity for this lift at above radius and boom length (Which one are you working with?)		
360° (lbs) =		
Pick & Carry (lbs) =		
Over the Front (lbs) =		
Over the Side (lbs) =		
Over the Rear (lbs) =		
Can the Boom Make the Lift? Yes <input type="checkbox"/> No <input type="checkbox"/>		

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Hoist Rope	
Capacity per Parts of Line =	
Minimum Parts of Line Needed =	
Actual Parts of Line Reeved =	
Total Suspended Weight =	
Can the rope make the lift? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Decision	
Can the boom and the hoist line make the lift? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Can the Set-down be made? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is more than one crane needed to make the lift? Yes <input type="checkbox"/> No <input type="checkbox"/>	
If yes, explain:	
PRE-LIFT SAFETY CHECKLIST	
<i>Note: all safety checklist items must be marked "yes" for the lift to proceed</i>	
Boom clearance sufficient? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Swing radius verified & flagged? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Soil conditions okay? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Taglines in place? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Weather/Wind acceptable? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Annual inspection current? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Please list any additional hazards below:	
APPROVAL	
Qualified Crane Operator's Name & Signature:	
Qualified Rigger's Name & Signature:	
Job Supervisor's Name & Signature:	
Designated Signal Person Name & Signature:	
All affected personnel must review the Critical Lift Plan before involvement in the lift. If any concerns should arise, please contact the lift supervisor. Please print and sign below after reviewing this plan.	

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Appendix 8.3 - FMMO Alternative Safety Requirements for Suspended Load Operations

This standard applies to specifically identified operations conducted on FMMO property involving both FMMO employees and/or contractor personnel. The standard is an alternate means of offering protection for personnel that are required to work directly under or in a hazardous area within close proximity of a suspended load. FMMO Management and the Safety Department is responsible for its implementation and enforcement. The Morenci Health and Safety Department will inspect the working conditions of employees performing these specified operations for compliance with these alternate standard requirements.

Suspended Load Operation Definition

An operation is considered a suspended load operation and subject to the requirements of this standard if it meets all three of the following criteria:

1. The operation involves the use of a crane or hoisting apparatus that supports the weight of a suspended load. (This excludes operations where the load is secured in a holding fixture or on substantial blocks supporting the entire load even though the crane/hoist hook may still be attached.) No distinction is made between a static load and a dynamic load. Rigging, i.e., slings, Hydra-sets, lifting fixtures, shackles, straps, when attached to the hook, is considered part of the load.
2. Personnel involved in the operation have any part of the body directly beneath the suspended load. (This excludes operations where employees have their hands on the sides of a load, i.e., to guide the load.)
3. In the event of a crane/hoist failure, as the load drops it could contact personnel working directly beneath it, with injury or death as a possible result. (This excludes operations where employees have their hands only partially under a load such that a crane or hoist device failure would push their hands out of the way not resulting in injury. This also excludes situations where the falling load would come to rest on hardware that is not suspended before an employee could be injured.)

Requirements

It is recognized that cranes and hoists do not generally meet the support requirements of a system that would allow personnel to work beneath a suspended load. FMMO's first hazard avoidance protocol is to design hazards out of the system or operation. Accordingly, it is FMMO intent and goal that all future systems, hardware, and equipment be engineered, designed, installed, and operated to prevent exposing employees to working under loads suspended from cranes and hoists. Due to the uniqueness

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of specific mining activities and the limitations imposed when using present systems, hardware, equipment, and facilities, suspended load operations may be permitted only under specifically approved and controlled conditions. Each suspended load operations shall be reviewed on a case by case basis and shall NOT be performed unless all (15) of the following special requirements are met:

1. All suspended load operations will be approved by the manager in charge of the work upon review of a detailed risk assessment of the operation. The risk assessment will be prepared by the superintendent, employees and safety representative responsible for the area and coordinated through the engineering department as needed. The analysis documentation will include the following:
 2. A justification why the operation cannot be conducted without personnel beneath the load. Feasible procedure/design options will be investigated to determine if the work can be accomplished without personnel working under a load suspended from a crane/hoist.
 3. Details of the precautions taken to protect personnel should the load drop. Secondary support systems, i.e. equipment designed to assume support of (catch) the load preventing injury to personnel should the crane/hoist fail, shall be evaluated and used whenever feasible. Secondary support systems will be constructed with a minimum safety factor of 2 to yield.
 4. The maximum number of exposed personnel allowed and timeframes of exposure. Steps shall be taken to limit the number of personnel working under a load suspended from a crane/hoist. Only those essential personnel absolutely necessary to perform the operation will be allowed to work in the safety controlled area. Steps shall be taken to ensure that personnel do not remain under the load any longer than necessary to complete the work.
 5. Only those suspended load operations approved by the by the manager of the area and safety department will be permitted, subject to this standard. A list of approved suspended load operations will be maintained by the Safety department and made available for review.
 6. Applicable SOP's and or JSA's (e.g. documents used as operational controls for the task) will be revised to specify the necessary additional requirements identified by the risk assessment. The procedures will be available on site for review during the operation.
 7. During a suspended load operation, if a new procedure not covered by the original analysis is deemed necessary due to unusual or unforeseen circumstances, the manager of the area and safety department will be consulted and must approve and document the procedure before operations continue. Safety will coordinate with Operations, Engineering, and other organizations as appropriate.
 8. The crane/hoist shall be designed, tested, inspected, maintained, and operated in accordance with manufacturer specifications and this standard. Test, inspection, and maintenance procedures will be developed and approved by qualified, responsible FMMO engineers. The results of the annual inspections will be maintained and made available to OSHA personnel upon request.
 9. Each crane, hoist and rigging apparatus involved in suspended load operations shall remain, throughout all steps of the task, under 75% of its capacity.

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10. Mobile cranes equipped with a friction drum or without active breaking mechanisms shall not be used to facilitate suspended load operations.
11. Before lifting the load involved in a suspended load operation, the crane/hoist will undergo a visual inspection (without major disassembly) of components instrumental in assuring that the load will not be dropped (e.g., primary and secondary brake systems, hydraulics, mechanical linkages, and wire rope). Noted discrepancies will be resolved before the operation continues. This pre-lift inspection will be in addition to the inspections required in section 5.5 of this standard.
12. A trained and competent operator shall remain at the crane/hoist controls while personnel are under the load.
13. Restricted access areas shall be established with appropriate barriers (flagging, rope, cones, etc.). All nonessential personnel shall be required to remain behind the barriers.
14. Prior to the suspended load operation, a meeting with the crane/hoist operator(s), signal person(s), person(s) who will work under the load, and the person responsible for the task shall be held to plan and review the approved operational procedures that will be followed, including procedures for entering and leaving the safety controlled area.
15. Communications (voice, radio, hard wired, or visual) between the operator(s), signal person(s), and the person(s) working under the load shall be maintained. Upon communication loss, operations shall stop immediately, personnel shall clear the hazardous area, and the load shall be secured. Operations shall not continue until communications are restored.

Appendix 8.4 – Rigging Inspection Form

Division:				Department:				
Print Name:				Payroll #:				
Date:				Storage Location:				
# legs/ sling	Manufacturer	Serial #	Size	Load Rating	Length	Tag Insp. Date	Link wear or stretch	Ok Repair Replace
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								

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