

Electrical Storms 2

1 PURPOSE

This procedure provides direction to identify the presence of electrical storms and protect the workers, equipment and facilities from hazards created by the presence of electrical storms.

2 SCOPE

This procedure applies to all mining functional areas, operations, projects, Geology, Exploration, and offices, including employees, vendors, visitors and contractors performing work on mine property.

3 DEFINITIONS AND ACRONYMS

Definitions

Approved is certified to meet the minimum standards established by the HSLP Department. All equipment used in the mining operations shall meet at least the American National Standards Institute (ANSI) standards, American Society for Testing and Materials (ASTM), or other international or local standards which comply with or exceed those standards.

Detectors are portable or stationary detectors approved for use and which are controlled and operated by trained personnel.

Ground Personnel are personnel working in any area out of doors.

Yellow Warning Alert is a warning used to indicate that an electrical storm is approaching within 10 to 20 miles.

Orange Danger Alert is a warning used to indicate that an electrical storm is approaching within 5 to 10 miles.

Red Danger Alert is a danger alert to indicate an electrical storm directly over the area within 5 miles. Cloud to ground lightning observed in the immediate area is also considered a Red Danger Alert.

Shelter/Refuge is a confined environment which adequately protects ground personnel and is capable of withstanding atmospheric electric discharges such as a grounded building or any vehicle/equipment that offers protection from electrical storms.

Storm Aware is personnel remaining diligently aware of storm and lightning conditions in their areas at all times regardless of lightning detector alert status.

Acronyms

HMR	HSLP Management Representative
HSLP	Health Safety and Loss Prevention
PPE	Personal Protective Equipment

4 ROLES AND RESPONSIBILITIES

Document Owner

HMR

Responsible Roles and Position-Holders

Contractors/Vendors

Contractors/Vendors are businesses performing a service for the mine. They are responsible for ensuring their employees working on mine sites understand and comply with the requirements as outlined in this procedure.

Employees and Contracted Employees

All employees in any position, or contracted employees working on any mine site. They are responsible for complying with the requirements as outlined in this procedure.

Visitors

Visitors are anyone not employed by the mine in any capacity but are traveling or touring any mining site. They are responsible for complying with the requirements as outlined in this procedure.

Foreman / Supervisors or Designee

Supervisor/Foreman or Designee can be an employee or a contractor/vendor working or traveling on any mining site. They are responsible for training, and for the enforcement of all requirements, rules, and established guidelines as outlined in this procedure.

Site Designated Security/Mine Dispatch/Controller

Sites will designate personnel to monitor lightning alerts through e-mail and telephone communication. Designated personnel will also monitor additional weather services for additional storm information as needed.

HSLP Department

HSLP is any employee working within or under the direction of the Director of HSLP. They are responsible for monitoring and periodically auditing this procedure for compliance.

5 DIRECTION

All employees, vendors, contractors, and visitors traveling/working on site shall comply with and ensure personnel accountable to them comply with the following requirements of this procedure.

General

- All personnel shall be trained in alert, protection and evacuation procedures.
- Communication of electrical storm alert can be communicated by radio, face to face, or other means.
- All ground personnel or group of personnel must have at least one adequate means of communication when they are carrying out field work.
- If needed, detectors shall be worn or placed in an appropriate location and monitored by personnel specially designated and trained in their use.
- All personnel are to be Storm Aware at all times for areas they are working and travelling in.

Supervisors

- Supervisors shall be aware of weather conditions and when there is the possibility of an approaching electrical storm.
- Portable detectors shall be available and used as needed.
- Shall ensure his/her employees are informed when there is an electrical storm alert and ensure proper action is taken.

Electrical storm alerts

Yellow Warning Alert – Storm is approaching and is within 10 – 20 miles. In the event of a Yellow Warning Alert;

- Security/Mine Dispatch/Controller will communicate that a yellow alert is in progress every 30 minutes over all mine site radio channels.
- Employees must be alert to the development of the storm.
- Supervisors must monitor the development of storms and ensure preparations for the protection and movement of personnel during red alert are taken as needed.

Orange Danger Alert – Storm is approaching and is within 5 – 10 miles. In the event of an Orange Warning Alert;

- Security/Mine Dispatch/Controller will communicate that an orange alert is in progress every 20 minutes over all mine site radio channels.
- Personnel who are working outdoors must prepare to take appropriate action if storm reaches Red Danger Alert.
- Supervisors shall ensure that ground personnel have refuge available to them in case conditions change to Red Danger Alert.
- Supervisors must monitor the development of storms and ensure preparations for the protection and movement of personnel during red alert are taken as needed.

Red Danger Alert – Storm is directly over the area and is within 5 miles. In the event of a Red Danger Alert;

- Security/Mine Dispatch/Controller will communicate that a red alert is in progress every 10 minutes over all mine site radio channels.
- The area supervisors and other responsible personnel will proceed to evacuate and transport all personnel to the shelters.
- All vehicle drivers, equipment operators must remain in their respective units with their windows completely closed until the Red Alert has been terminated.
- Those Single Operations (haulage, loading and auxiliary services) may continue operations ensuring that all doors and windows are completely closed.
- The Indoor activities in workshops and offices may continue their normal activities keeping doors and windows completely closed and remaining within the facilities until the Red Danger Alert is terminated.
- If your vehicle has been struck by lightning, remain inside until the red alert has been terminated.
- During the ongoing blasting procedure, the area of influence must be evacuated and activities must be stopped until the red alert is terminated. In this case, the blasting evacuation procedure will be applied.
- All surface drilling activities such as exploration rigs where workers are required to operate in the open air must seek refuge until the red alert is lifted.
- All crane and rigging operations must be stopped, loads grounded and exposed workers must seek refuge.
- Supervisors must ensure all appropriate measures are taken to minimize potential exposure. Appropriate measures may include transporting personnel to or from parking lots during shift changes.
- Travel for short distances from shelter to shelter is permitted only after close observation indicates no lightning is occurring in the immediate area. Examples include: Building to Bus, Vehicle to Building, Vehicle to Vehicle, etc. If there is any question of safe travel or not, personnel are to remain in present shelter unless emergency situations occur. (Fire, personnel requiring medical attention, etc).

Remote Work Sites

Personnel working in remote sites where the Security/Mine Dispatch/Controller alerts are not available shall apply the “Flash to Bang” Method and/or use portable lightning detectors following the requirements for Yellow Warning Alert, Orange Danger Alert and Red Danger Alert outlined in this procedure.

Remote Work Sites (CONT.)

Lightning Distance Method - In order to determine the distance between the lightning activity and yourself, use the “Flash to Bang” Method: count the time in seconds from seeing lightning’s flash, to hearing the associated thunder or bang. For each five seconds, lightning is one mile away.

FLASH TO BANG	DISTANCE OF LIGHTNING
Seconds	Miles
FIVE (5) SECONDS	1 MILE
TEN (10) SECONDS	2 MILES
FIFTEEN(15) SECONDS	3 MILES
TWENTY (20) SECONDS	4 MILES
TWENTY-FIVE (25) SECONDS	5 MILES

When the difference between flash to bang is 25 seconds or less it is considered to be a Red Danger Alert.

When the “Flash to Bang” Method is used the Red Danger Alert will remain in effect until lightning/thunder events are no longer observed within the Red Danger Alert Zone.

Monitoring of Lightning Detection Systems

All ground personnel or group of personnel without access to lightning detection systems will carry personal lightning detectors as determined necessary by supervisors when they are carrying out field work.

All hand held lightning detectors will be approved by HSLP prior to use. All employees using a personal lightning detector must be trained on the correct operation of the detector.

The Security/Dispatch/Controller will monitor alerts from recognized weather service providers and communicate to personnel when strikes occur that trigger yellow, orange, and red alerts.

Blasting Operations During Electrical Storms

In the event of a yellow alert, the Blast Foreman or designee shall monitor current weather information to determine potential storm events which could interfere with blasting activities and take appropriate action to minimize and eliminate potential hazardous situations.

In the event of a Red Danger Alert, the blast area will be cleared of personal and blocked as if it were a scheduled blast. Explosives trucks will be locked and remain on the pattern.

Blocks will be held until the Red Danger Alert has been lifted.

If a Red Danger Alert occurs while sleeping a pattern, the Production Foreman in charge of the area will be responsible for blocking the area until the Red Danger Alert has been lifted.

Recommendations When No Refuge is Available

Warning signs of possible lightning strike is a tingling sensation on skin or his/her hair stands on end.

If an employee is caught in the open and cannot get to a refuge:

- Try to get away from open places.
- Look for depressions in the land, except for rivers or ravines.
- Put yourself in a squatting fetal position with hands on the knees and do not lie down.
- Do not stand under trees or next to wire fences, high-voltage cables, or metallic objects.

6 RISK ASSESSMENTS

Each area shall conduct risk assessments to determine locations where there is potential exposure of lightning to personnel and identify shelters where personnel can seek protection.

Area risk assessments shall include actions to be taken in emergency situations, evacuation of personnel, shift changes, activity planning at first alert, etc.

7 RECORDS AND REFERENCES

Records

None

References

Developmental References

National Lightning Safety Institute

National Fire Protection Agency (NFPA-780)

International Electro-Technical Commission Standard (IEC 62305/61643)

OHSAS 18001: 2007, Section 4.4.6