Austin Powder Company's Misfire Procedures

When a misfire occurs, use the one-half hour waiting time to clear your mind and think about the condition that has been created. Document the hole or area that contains the misfire completely, while this is still fresh in your mind.

Do not permit any work in the misfire area. "Danger" off the area. Notify the permittee of the misfire. Contact your supervisor for assistance. We recommend that prior to refiring a misfire, another blaster familiar with the mine/quarry be brought in to assist with the decision to fire or render inert the explosive.

Proper misfire handling should be conducted by experienced individuals familiar with the initiation systems and explosives used, as well as the proper techniques to handle, neutralize and render safe the explosive materials. Specific recommendations cannot be made concerning misfires as every misfire is unique and very site specific. Each misfire must be handled individually.

All information regarding the misfire must be analyzed completely and a plan of action established with a method to "Make Safe" the area. Specific Federal/State or Local laws may also dictate additional procedures.

When a misfire occurs, the power source used to initiate the blast must be disconnected, the firing line shunted or made safe before entering the blast area to inspect the misfire. All personnel must stay out of the blast area for at least 1/2 (30 minutes) hour. Access to the blast area must remain blocked and guarded.

Once a determination is made by the blaster in charge and another blaster familiar with the area of the stability of the area, such as adequate burdens, spacing, stemming, etc., a decision may be made to refire the misfire. Refiring a misfire is usually the safest and best way to eliminate the danger. Extra care must be taken, as the designed pattern HAS changed.

Once a determination has been made to refire, the blast area must be cleared to double the initial perimeter (at a minimum). If this is not possible, alternate methods of handling should be considered.

The Federal Mine Safety and Health Administration (MSHA)

IN 30 CFR (CODE OF FEDERAL REGULATIONS), PART 57.6000, DEFINES A MISFIRE AS:

"The complete or partial failure of explosive material to detonate as planned. The term also is used to describe the explosive material itself that has failed to detonate.

A misfire is described as the failure of an explosive charge to detonate. The best advice that can be given regarding the handling of misfires is to take every precaution to prevent their occurrence.

Anytime misfired holes, portions of a misfired hole, or unexploded explosive material remains after a blast is fired, a hazardous situation is created that will exist until the proper handling of unfired explosive material. A misfire requires sound judgement and a comprehensive understanding of explosives. Most misfires occur because of improper techniques or short cuts, and sometimes because of the geological formation.

It is important that any investigation into a misfire be conducted with a fair and open mind. Any preconceived idea of the cause may mask the true cause, and prevent a future occurrence."

MSHA - 30 CFR. PART 57.6311 ADDRESSES THE HANDLING OF MISFIRES AS:

(a) Faces and muck piles shall be examined for misfires after each blasting operation.

(b) Only work necessary to remove a misfire and protect the safety of miners engaged in the removal shall be permitted in the affected area until the misfire is disposed of in a safe manner.

(c) When a misfire cannot be disposed of safely, each approach to the area affected by the misfire shall be posted with a warning sign at a conspicuous location to prohibit entry, and the condition shall be reported i mmediately to mine management.

(d) Misfires occurring during the shift shall be reported to mine management not later than the end of the shift.

MSHA - 30 CFR. PART 57.6310 DEFINES THE MISFIRE WAITING PERIOD AS:

When a misfire is suspected, persons shall not enter the blast area until:

(a) For 30 minutes if safety fuse and blasting caps are used; or

(b) For 15 minutes if any other type detonators are used.

The Occupational Safety and Health Administration (OSHA)

(a) If a misfire is found, the blaster shall provide proper safeguards for excluding all employees from the danger zone.

(b) No other work shall be done except that necessary to remove the hazard of the misfire and only those employees necessary to do the work shall remain in the danger zone.

(c) No attempt shall be made to extract explosives from any charged or misfired hole; a new primer shall be put in and the hole reblasted. If refiring of the misfired hole presents a hazard, the explosives may be removed by washing out with water or, where the misfire is under water, blown out with air.

(d) If there are any misfires while using cap and fuse, all employees shall remain away from the charge for at least 1 hour. Misfires shall be handled under the direction of the person in charge of the blasting. All wires shall be carefully traced and a search made for unexploded charges.

(e) No drilling, digging, or picking shall be permitted until all missed holes have been detonated or the authorized representative has approved that work can proceed.

OSHA Regulations (Standards - 29 CFR) Misfires. - 1926.911

- Standard Number: 1926.911
- Standard Title: Misfires.
- SubPart Number: U
- SubPart Title: Blasting and the Use of Explosives

REFERENCES

Avey, L. 1990. ***Pre-Split Economics and Practice at Gold Fields Operating Co. - Gold Fields Mine.*** Proceedings of the Sixteenth Conference on Explosives and Blasting Technique. Orlando, FL: International Society of Explosives Engineers.

Chiapetta, F., Borg, D. and Sterner, V. (Eds.) 1987. ***Explosives and Rock Blasting. Dallas,*** TX: Atlas Powder Company Field Technical Operations.

Hopler, R. (Ed.) 1998. ***Blasters' Handbook 17th Edition.*** Cleveland, OH: International Society of Explosives Engineers.

Konya, C. and Walter, E. 1991. ***Rock Blasting and Overbreak Control. McClean,*** VA: United States Department of Transportation Federal Highway Administration.

Siskind, D., Stachura, V., Stagg, M. and Kopp, J. 1980. ***Structure Response and Damage Produced by Airblast from Surface Mining.*** United States Bureau of Mines Report of Investigations 8485. Washington, D.C.: United States Department of the Interior.