Workplace Safety North

Health and Safety Report

Mine Rescue Body Recovery Report

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Workplace Safety North™

ONTARIO MINE RESCUE
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Workplace Safety North recognizes that individual companies must develop health and safety policies and programs which apply to their workplaces and comply with appropriate legislation. The information contained in this reference material is distributed as a guide only to assist in developing those policies and programs.

While WSN cannot guarantee the absolute accuracy or sufficiency of this information, we will be pleased to respond to individual inquiries about this information at any time.

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Under the direction of the Ontario Mine Rescue Technical Advisory Committee, a subcommittee was created to address the preparation of a report on body recovery by mine rescue teams.

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- Mike Dudar — Senior Geologist, Creighton Mine, Vale
- Bruce Hall — Ontario Mine Rescue Officer/Consultant
- Tim Maloney — Superintendent Services – Emergency Management, Vale
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- Greater Sudbury Police Service
- Ministry of Community Safety and Corrections Services, Sudbury Coroner's Office
- Sudbury Emergency Services
- Ontario Mine Rescue Technical Advisory Committee

Mine Rescue Body Recovery Report

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BODY RECOVERY REPORT

Audience: Mine rescue team members and members of emergency control groups

Goal: The purpose of this guideline is to familiarize participants with:

- roles and responsibilities following a fatality
- personal protective equipment and procedures required for body recovery
- applicable sections of the Regulations for Mines and Mining Plants and Coroners Act

Objectives: Participants will:

- understand everyone's roles and responsibilities following a death in the workplace
- recognize factors that influence body deterioration
- recognize the requirement for personal protective equipment
- understand procedures mine rescue teams need to use when recovering a body

Authorization

Any attempt to recover a body or body parts must be made within the legislation described in the Occupational Health and Safety Act (OHSA) and Regulations for Mines and Mining Plants and the Coroners Act, R.S.O. 1990.

Occupational Health and Safety Act

Part VII, Notices

Notice of Death or Injury

51. (1) Where a person is killed or critically injured from any cause at a workplace, the constructor, if any and the employer shall notify an inspector, and the committee, health and safety representative and trade union, if any, immediately of the occurrence by telephone or other direct means and the employer shall, within 48 hours after the occurrence, send the director a written report of the circumstances of the occurrence containing such information and particulars as the regulations prescribe. R.S.O. 1990, c. O.1, s. 51 (1); 2011, c. 1, Sched. 7, s. 2 (7).

Preservation of Wreckage

(2) Where a person is killed or is critically injured at a workplace, no person shall, except for the purpose of,

a) saving life or relieving human suffering
b) maintaining an essential public utility service or a public transportation system; or
c) preventing unnecessary damage to equipment or other property,

interfere with, disturb, destroy, alter or carry away any wreckage, article or thing at the scene of or connected with the occurrence until permission so to do has been given by an inspector. R.S.O. 1990, c. O.1, s. 51 (2).

Coroners Act, R.S.O. 1990

Chapter C.37

Definitions

Interpretation of body

1. (2) A reference in this Act to the body of a person includes part of the body of a person

Police assistance

9. (1) The police force having jurisdiction in the locality in which a coroner has jurisdiction shall make available to the coroner the assistance of such police officers as are necessary for the purpose of carrying out the coroners duties. 2009, c. 15, s. 5.

Duty to give information

Deaths to be reported

Notice of death resulting from an accident at or in construction project, mining plant or mine

10. (5) Where a worker dies as a result of an accident occurring in the course of the worker's employment at or in a construction project, mining plant or mine, including a pit or quarry, the person in charge of such project, mining plant or mine shall immediately give notice of the death to a coroner and the coroner shall hold an inquest upon the body. R.S.O. 1990, c. C.37, s. 10 (5); 2009, c. 15, s. 6(5)

Interference with body

11. No person who has reason to believe that a person has died in any of the circumstances mentioned in section 10 shall interfere with or alter the body or its condition in any way until the coroner so directs by warrant. R.S.O. 1990, c. C.37, s. 11

Roles and Responsibilities

When a fatality happens at a mine site, agencies such as police, Ministry of Labour and the coroner must be notified.

Emergency Control Group Responsibilities (Mine Management):

- Responsible for site safety and control of all operations both on surface and underground
- Co-ordinating inter-agency activities
- Establishing an emergency control room
- Briefing mine rescue teams
- Following their established emergency response plan

Police Responsibilities

- Will preserve the scene
- Gather evidence
- Report their findings to bring about criminal conviction if appropriate
- Assist the coroner

Coroner Responsibilities

- Will preserve the scene
- Gather evidence and interpret evidence from the body
- Answer five questions **Who** died, **When**, **Where**, **How** (medical cause of death), by **What** means
- Make recommendations to prevent future deaths in similar circumstances, possibly through an inquest

Ministry of Labour Inspector Responsibilities

- Ensure the scene has been secured
- Ensure there are no ongoing health and safety concerns
- Conduct an investigation of the workplace
- Take enforcement action, as appropriate, if they find violations of the OHSA and its regulations. This may include issuing orders and/or laying charges under the OHSA.

Mine Rescue Responsibilities

The four main objectives of mine rescue and recovery work, both fire and non-fire are:

- To ensure the safety of mine rescue and recovery teams
- To find trapped or missing miners and bring them to surface
- To respond to and resolve fire and non-fire emergencies
- To examine the mine for dangerous concentrations of any noxious gases that would prevent normal operations in any part of the mine

Mine emergencies may occur where body recovery will become the responsibility of mine rescue teams. Examples of emergencies where mine rescue teams have been used to recover bodies are:

- Mine fires
- Gas explosions
- Oxygen deficient atmospheres
- Runs of muck
- Rock bursts
- Other incidents requiring special services
- Falls of ground
- Shaft sinking

Mine Rescue Responsibilities on Scene

- Secure the scene
- Control or correct hazards
- Preserve evidence
- Keep records
- Recover body and personal belongings

When it can be done safely the police, coroner and Ministry of Labour will conduct their investigation before a body is recovered by a mine rescue team. The scene of the fatality must be released by each agency before mine rescue teams can recover the body. While the employer, Ministry of Labour, coroner and police share jurisdiction over the incident site, only the coroner has jurisdiction over the body. The police and coroner work together and the police will work on behalf of the coroner. The lead agency is determined by the circumstances of the fatality, as an example, if it is a criminal investigation the police will take the lead. Waiting for each agency to complete their investigation can be a source of frustration and emotional distress for mine rescue teams.

Team Safety

Rescue and recovery work are different. During a rescue, response time is important. When responding to a recovery, time is not as important.

People can be traumatized and not think clearly when a fatality occurs. It is important that risks to the team are recognized and fully evaluated.

The emergency control group should ensure that mine rescue teams are fully briefed in respect to what they will see, potential hazards and the recovery procedure that is to be attempted and deployed before the body recovery begins.

If the identity of the deceased is known it should be communicated to the team prior to going underground. There is potential for additional distress if a mine rescue team member knows the deceased.

The emergency control group and mine rescue teams should identify a staging area for recovery tools, equipment as well as a lay down area for recovered bodies. Instructions from the emergency control group should be provided in writing.

It is important that all mine rescue team members who come into contact with a body adopt precautionary measures that will prevent contamination from bacterial or viral infection. These precautionary measures should include;

- **Vaccinated** for hepatitis A, B and tetanus
- **PPE** – including eye protection, disposable masks and disposable gloves
- **Cover open wounds** – and wash with a disinfectant cleaning solution such as Bio guard after contact with a body. Shower on return from the incident.
- **Thoroughly clean** – or dispose of any equipment used in the incident including PPE
- **Body bags** – use body bags whenever possible. If body bags are not available, the bodies can be wrapped in blankets.
- **Bodies** – that have been underground awhile should be sprayed with disinfectant before you touch or handle them.

It is the duty of the team captain to continually monitor the condition of his/her team. Twenty-minute team checks should be conducted to monitor each team member's physical, mental and emotional state. If any team member cannot continue, the recovery should stop until he/she is replaced by backup personnel.

Scene Management

Upon arrival at the scene the team should first look for hazards and assess the risks of any action they take. Any hazards found must be corrected before proceeding. In previous recoveries hazards have included unstable muck piles, open holes, unsupported ground and hung up ore passes or draw points.

When a team locates a body, the team should report it to the briefing officer and emergency control group. A secure radio channel or telephone should be used to ensure all information about the incident remains confidential.

The body should be assessed by doing a primary survey to ensure vital signs are absent (VSA). A body that is VSA should only be moved when it is necessary to preserve the body or evidence or if instructed by the agencies investigating the fatality.

The body's location and position should be noted on a mine level plan and on the drift walls or back. Accurate records including notes, sketches or drawings are invaluable. Anyone in contact with or entering the scene must be prepared to give a statement to police. The team captain must keep written chronological records which should include when the team's shift began, the work conducted by the team, and when a body was located, recovered and removed from the scene. Taking pictures with a camera is helpful especially if investigators cannot visit the scene.

If there is more than one body, usually an identifying number is given to each one. This number should also be marked on the level plan and drift walls or back.

When a body is located every effort should be made not to disturb any possible evidence in the area. Evidence will be important later in ensuing investigations. Mine rescue team members need to be aware that they may be required to testify or provide evidence in court or at an inquest.

Body Recovery

Only the required number of mine rescue team members should be employed to safely carry out the recovery.

Do not examine the victim's clothing for personal possessions. Nothing should be removed from the body except in the presence of witnesses and after a written record is made of the items removed.

If instructed by investigators, all personal belongings such as hard hat, glasses, miner's belt, cap lamp and lunch pail should be brought out with the body. The location of personal belongings should be noted either with pictures of the scene or on a plan.

If requested, the coroner will provide advice on how best to extricate or handle the body.

Bodies recovered shortly after death will not present many problems because they have not begun to decompose. Rescuers can lift bodies by the shoes and arm pits and place the victims in body bags. With bodies that have begun to decompose, mine rescue teams will have to be extra careful. Trying to put these bodies in body bags will be more difficult.

When pulling on an arm, leg or a foot it may come off because the ligaments, muscles and tendons have decayed. Part of the skin may remain in a boot if the boot comes off. If a leg pulls out of a socket there may be a cracking noise.

One of the best methods for transferring a decomposed body to a body bag is to gently roll the body onto a blanket, tarp or sheet of plastic placed next to the body. Once the body is on the blanket, tarp or plastic pick up the four corners and place the body along with the blanket or plastic into the body bag. This method also helps limit contact with the body.

If it is necessary to straighten limbs that have stiffened by rigor mortis to get the body into a body bag, some force will be required. Try not to cause unnecessary damage to the body.

In cases where bodies are buried or entangled in debris, the bodies will need to be extricated slowly. Any extrication work close to bodies or body parts should be done by hand. If an extra limb or body part is found, put it in its own body bag. Mark the bag with what it contains so that it can be later matched to the right body.

Bodies should be transported with dignity. Mine rescue teams should ensure the body is fully covered and secured in the stretcher during transport.

These are unpleasant things that a mine rescue team may have to deal with. Some team members may be better able to cope with recovering bodies than others. If you feel you are not prepared, don't try to bluff your way through. Don't be afraid to admit that you cannot do it.

Condition of Bodies

Recovering bodies is a difficult task for mine rescue teams. It is more difficult when they may know or recognize the deceased. There is not much that can be done to prepare mine rescue teams for what they will encounter. Teams should know that for the spouses and family members involved it is important to have closure and be able to bury their loved ones.

In some cases, bodies will have no visible signs of injury, while others may be badly disfigured, burned or dismembered.

If bodies are not recovered soon after death, they will begin to decompose. In addition to gruesomeness of a decomposing body, there will also be a stench from the rotting flesh and body parts. Mine rescue teams have chosen to use menthol nose rubs (Vicks), facemasks with organic cartridges or breathing apparatus to mask or avoid the odour.

Mine rescue teams should expect to see unpleasant sights when recovering bodies regardless of how long they have been dead. After death the body goes through various changes and stages of decay.

Factors That Influence Body Deterioration

1. **Air temperature** – A body at freezing temperatures can be preserved for weeks. A body at 21 °C or higher will begin to decay very rapidly. In a mine with a temperature of 15 °C decay may not begin for about 10 hours after death. The parts of a body that are exposed to air will decay faster than the parts that are covered, for instance, with clothing.

2. **Body size** – The more muscular the individual, the sooner rigor mortis will develop, probably within four to eight hours. The more obese the individual the longer it will be before rigor mortis develops, probably within six to 10 hours. An obese individual will begin to decay sooner than a muscular individual.

3. **Body fluid** – The body is 80 per cent liquid. During decomposition the fluid breaks down and creates gas pressure. Fluid may be forced out of the mouth, nose, ears and other orifices. Blisters will form under the skin and cause the body to swell. After death the body's muscles may relax causing the deceased to void his/her bladder and bowels.

4. **Smell** – There will probably be no decay odour for the first four to eight hours following death. When the decay process begins, so does the smell. The smell is the result of decay and the gases escaping the body. When a body is moved, the smell will be stronger. A body that has

suffered physical trauma such as from a rock fall will decay faster and have a worse odour than someone who died from asphyxiation.

Dead bodies will turn dark where the blood pools. If the victim is lying face down, the front of the body will be dark. If a body is immersed in cold water, it will remain in almost perfect condition for the first two or three days. Most of the time the body will remain under water for the first two days then it will float. The body floats because of the gases that build up within the body.

Welfare of Mine Rescue Team Members and Emergency Control Group Members

The recovery of bodies from any incident is distressing for mine rescue team members and others involved. Critical incidents, such as body recoveries can cause strong emotional reactions that overwhelm an individual's ability to function in a normal manner at work, at home, or in any aspect of their life. This strong emotional reaction is referred to as critical incident stress. It is important that mine rescue team members are made fully aware of the support network that is available to them following a mine rescue response involving serious injuries or a fatality.

Critical incident stress management teams must be made available to anyone exposed to an incident immediately following the incident. Stress related anxiety is normal, but if the emotions are not dealt with in a healthy, effective fashion, they can result in emotional turmoil and even harmful behaviour. More information about critical incident stress can be found in Appendix A of the Ontario Handbook of Training in Mine Rescue and Recovery Operations.

Biohazardous Waste

Biohazardous waste is any waste containing infectious materials or potentially infectious materials such as blood, urine, feces, saliva, spinal fluid or vomit. This includes items contaminated with biohazard waste that, if compressed, would release biohazard waste in a liquid or semi-liquid form, or items caked with dried biohazard waste capable of being released during handling.

Each mine site should have a designated decontamination area. This area will be used to disinfect contaminated equipment. Biohazard cleaning supplies and equipment should be provided.

Before transporting contaminated equipment to the designated cleaning area, these items should be placed in red biohazard bags or containers.

When cleaning contaminated equipment, proper personal protective equipment shall be worn. Appropriate PPE includes personal protective equipment that will protect against direct or indirect splash exposure.

Equipment that has been contaminated by blood or body fluids shall be decontaminated through cleaning and disinfecting or disposed as contaminated waste.

Equipment that has become soiled with blood or body fluids must be cleaned and disinfected using a 1:10 solution of bleach or approved hospital disinfectant. If using bleach, do not mix with other cleaning agents. Wear gloves and use disposable paper towels to remove contaminants. After removal of visible material, decontaminate with bleach solution using towel, microfiber cloth or sponge mop. Before using bleach solution, equipment can be first cleaned with soap and water. Disinfecting solution should be allowed to cover all surfaces of contaminated equipment for 30 minutes before drying it. Use clean towels to wipe bleach from equipment and allow to air dry. Dispose of used cleaning supplies as contaminated waste.

Biohazard Cleaning Supplies and Personnel Protection Equipment

Each mine site should ensure that sufficient biohazard kits can be assembled at the mine for a timely initial response to an event that involves one or more fatalities. Biohazard kits are required to disinfect personnel, personal protective equipment, rescue equipment and bodies.

Biohazard Kit List

The following is an example of a biohazard kit:

- 1 – 32-gallon Brute container red
- 1 – 32-gallon Brute lid red
- 1 – Box of each size (large, x-large) nitrile gloves
- 6 – Pair of 11-inch rubber work gloves
- 6 – Biohazard coveralls with hoods
- 2 – Face shields
- 1 – Roll of duct tape
- 1 – Roll of caution tape
- 6 – Bath towels
- 1 – 32 oz. funnel
- 2 – Each of Microsan instant hand sanitizer
- 3 – 24 oz.-spray bottles
- 1 – Gallon of Percept
- 1 – Plastic pail
- 1 – Heavy duty sponge mop with handle and refill sponge mops
- 1 – Microfiber cloth (16” x 16”)
- 6 – Masks
- 1 – Odour-masking product
- 10 – Biohazard red bags
- 2 – Heavy duty body bags
- 1 – Roll of heavy duty plastic sheeting

Sources

Ontario Handbook of Training in Mine Rescue and Recovery Operations

Ontario Coroners Act

Ontario Occupational Health and Safety Act and Regulations for Mines and Mining Plants

Mining Safety and Health Administration, Body Recovery

World Health Organization, Disposal of Dead Bodies in Emergency Conditions

Stringer, Brisbin and Humphrey Management Lawyers, Managing the Consequences of Workplace Accidents

Hertsfordshire Fire and Rescue Service, Body Recovery

New South Wales Government, Guidelines for Agency Co-ordination during Emergencies and Body Recovery at NSW Mines

Vale, Biohazard Kit

Ministry of Community Safety and Corrections Services, Sudbury Coroner's Office

Greater Sudbury Police Service

Sudbury Emergency Services