

# GUIDELINES FOR EMERGENCY PREPAREDNESS IN MINES AND QUARRIES



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### 1.0 INTRODUCTION

- A. Possible emergencies can be grouped under two main headings:
- B. **Natural:** Earthquake, earth movement/slip, flood, heavy snowfall, tsunami, volcanic eruption.
- C. **Man-made:** Strata failure, heating, inundation, explosion, vehicle accident, bomb threat, chemical spill, fire, gas leak, injury, missing person, power failure.
- D. It is important that hazards are identified and assessed so that accidents or emergencies can be managed, rather than depending on employees to 'rise to the occasion', should an emergency occur. When an emergency occurs it is too late to decide who will do what and what equipment you need.

### 2.0 DEVELOPMENT OF EMERGENCY PREPAREDNESS PLANS

- A. All mining and quarrying operations should have Emergency Preparedness Plans that match the scale and complexity of the enterprise, and the nature and extent of potential hazards and the degree of risk. There are however elements of methodology and planning that will be common to all operations.
- B. A concise policy statement describing the philosophy and approach to be taken to control emergencies, and in particular, the line of authority and responsibilities, needs to be outlined by way of an emergency management structure.
- C. There are two main elements that are necessary to properly manage emergencies:
  - a. Identification of significant hazards and risk analysis.

A full analysis of all hazards is required and the level of risk with each, to determine whether the hazard is 'significant' i.e. it has the potential to cause 'serious harm'. Where operations use hazardous materials and in complex processes, this will be more involved.
  - b. Development of an emergency plan to cover the safety of employees, contractors, people in surrounding area and other visitors and including for;
    - i Appointment and training of those who have responsibilities under the emergency management structure.
    - ii Display of emergency plans and phone numbers.
    - iii Conduct training using emergency equipment and related procedures.

- iv Availability, checking and maintenance of emergency equipment.
- v Information on the substances held.
- vi The actions to be taken and their sequence.

### **3.0 EMERGENCY PLANS**

#### **3.1 DEVELOPING A PLAN**

- A. The second component of the emergency preparedness process is the development of an Emergency Plan. This plan may be one that is required under the HSNO Act and as such will require to comply with the Hazardous Substances (Emergency Management) Regulations 2001.
- B. In all events the Plan must be:
  - a. Clearly documented;
  - b. Simple to execute;
  - c. Communicated effectively;
  - d. Exercised;
  - e. Revised and updated regularly.
- C. The plan must have ownership.
- D. All employees should be involved in developing the Plan.
- E. There are four basic steps to detailing a plan:
  - a. Analyse the risk;
  - b. Assess requirements for resources and services;
  - c. Allocate responsibilities;
  - d. Specify action details for emergency responses.

#### **3.2 ANALYSE THE RISK**

- A. Identify the types of incidents that may occur, for example:
  - a. Fire;
  - b. Flood;
  - c. Interruption of services;
  - d. Explosion;
  - e. Release of chemicals or toxic substances;
  - f. Falls of ground;
  - g. Electrical accidents;
  - h. Sudden illness;
  - i. Vehicle accidents;
  - j. Plant accidents;
  - k. Shaft collapse or hoisting accident;
  - l. Natural disasters (earthquake etc.);
  - m. Gas accumulation;
  - n. Unplanned roof fall;
  - o. Armed hold-up.

- B. Each identified incident should be scaled for probability and consideration given to the severity and potential for serious loss/harm:
  - a. High
  - b. Medium
  - c. Low

### **3.3 ASSESS REQUIREMENTS FOR RESOURCES AND SERVICES**

- A. External resources:
  - a. Mutual aid arrangements. (See Appendix B)
- B. On-site resources and services:
  - a. First aid and medical services;
  - b. Fire fighting resources;
  - c. Mine rescue equipment and teams;
  - d. Communication systems and backup;
  - e. Emergency services for compressed air, power, water etc.;
  - f. Environmental protection systems;
  - g. Provision for coping with casualties;
  - h. Evacuation systems and alternatives;

### **3.4 ALLOCATE RESPONSIBILITIES**

- A. The plan should include the roles and responsibilities of all key personnel, including provision for calling for external assistance.
- B. Items for consideration include:
  - a. Organisation and control:
    - i. What specific emergency action plans are identified;
    - ii. Organisational chart for areas of responsibility taking shift work into consideration;
    - iii. Systems for exercises and drills;
- C. Responsibilities for decisions on immediate action:
  - a. Under what circumstances, how and by whom is the emergency plan activated;
  - b. Authority to call for external assistance;
  - c. Shutdown of operations, who decides? How advised?;
  - d. Evacuation orders, personnel check procedures;
  - e. System for accounting for personnel for both planned evacuation and in a crisis situation. How? When? By whom? Evaluated by drills;
  - f. Notification to families of casualties, victim support;
  - g. Media control and public liaison.

### **3.5 SPECIFY ACTION DETAILS FOR EMERGENCY RESPONSES**

- A. An emergency control centre should be designated and should have the following:
- a. Copies of emergency preparedness plans;
  - b. Site layout with diagrams of services and facilities, including adjacent industry etc;
  - c. Details of internal emergency services;
  - d. Communication facilities, telephone, radio, etc;
  - e. Full personnel data;
  - f. Directories for external assistance and resources;
  - g. Call-out systems for rescue and fire crews;
  - h. Fire and mine rescue plans;
  - i. Hazardous materials data, (including Safety Data Sheets - SDS) location and quantity;
  - j. Evacuation systems;
  - k. Emergency systems;
  - l. Security;
  - m. Emergency alarm;
  - n. Personnel check systems for evacuations;
  - o. Staffing responsibility and control chart;
  - p. Procedures for managing injuries
  - q. Emergency equipment list with maintenance records;
  - r. Victim and family support;

### **4.0 INVESTIGATION AFTER AN EVENT**

- A. In the aftermath of an emergency it is essential to conduct a systematic investigation, an analysis exercise with all employees involved, to ensure that lessons learned are not lost.
- B. Identification of deficiencies in any aspect of response capacity will enable these to be rectified, and potential hazards in operating systems may also be identified and remedied.

## APPENDIX A: CHECKLIST FOR HAZARD ANALYSIS

- A. Is there a fire risk?
  - a. Vegetation
  - b. Plant or storage areas
  - c. Underground
  - d. Vehicles
  - e. Conveyor belts
- B. Could there be flooding?
  - a. Surface or underground inundation
  - b. Surface drainage in relation to open cut and underground operations
  - c. Positions of tailings or waste dumps in relation to operations
  - d. Approach to old underground workings
  - e. Major water storage dams in area
  - f. Settling ponds
- C. Could access be lost?
  - a. Shaft or roadway collapse
  - b. Accident to hoisting system
  - c. Collapse of decline access
  - d. Open pit road access lost by wall failure
  - e. Wash out of roads or bridges
- D. Could services be lost during an emergency?
  - a. Integrity of water supply
  - b. Supply of electricity and communications
  - c. Compressed air supply
  - d. Pumping/dewatering
  - e. Interruption of ventilation system
- E. Do you have emergency lighting?
  - a. Is there sufficient standby generating capacity
- F. Is there explosion potential?
  - a. Explosives or other volatile substances
  - b. Gas
  - c. Sulphide dust ignition
  - d. Electricity
  - e. Coal dust ignition
- G. What type of accidents could occur?
  - a. Vehicle accidents
  - b. Plant accidents
  - c. Falls of ground
  - d. Chemical spills
  - e. Hoisting accidents
  - f. Structural failure
  - g. Stockpile collapse
  - h. Electrical accidents
  - i. Maintenance accidents
  - j. Other

## **APPENDIX B: EXTERNAL OR MUTUAL AID ARRANGEMENTS AND RESOURCES CHECKLIST**

### **A. EXTERNAL OR MUTUAL AID:**

- a. Hospitals and doctors
- b. Police
- c. Fire Brigades
- d. Engineering and equipment supply groups
- e. Inspectorate (24-hr contacts)
- f. Support from other operations in the district
- g. Mines rescue services
- h. Emergency helicopters
- i. Commercial Vehicle Investigation Unit
- j. Hazardous Substances Technical Liaison Committee.

### **B. RESOURCES:**

- k. Communications
- l. Emergency response resources
  - i. Fire fighting equipment
  - ii. Brattice cloth and barricading materials and tools
  - iii. Ambulance or other transportation
  - iv. First aid staff and equipment
  - v. Emergency control room or command centre
  - vi. Specialised emergency equipment (air bags, jacks etc.)
  - vii. Mine rescue teams (properly trained)
  - viii. Self-rescuers
  - ix. Self-contained breathing apparatus
  - x. Standby power
  - xi. Auxiliary pumps
  - xii. Auxiliary hoists