

PART 2

PROCEDURES AND PROCESSES



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2.1 COMMUNICATION AND CONSULTATION

Ask any football coach why his team won the day before and he will say: "Every one of my players was motivated to win. They gave it 100%". Before a football game, the coach leads the practices and motivates the team, the players train and discuss strategy, the support staff makes sure all the equipment is in order. All members of the team must play their part, and whether they win or lose comes down to their performance on the field.

It is the same when a company is successful. Whether we are talking about productivity or occupational health and safety, success depends on the commitment of all members of the team.

The "football team" principle is participatory management with all personnel-employers and employees-participating in problem-solving and decision-making. When employees are involved in making a decision, no matter what it may be, they are more inclined to accept the consequences and put that decision into practice.

Using this approach to the OH&S program will decrease the chance of having an accident. Management commitment and worker involvement is central to any occupational safety and health program.

2.1.1 OCCUPATIONAL HEALTH AND SAFETY COMMITTEES

The Occupational Health and Safety Committee (OHSC) is the way management can formally approach accident reduction. It can:

- discuss health and safety issues;
- provide health and safety information;
- discuss health and safety performance;
- review workplace OHS systems and procedures; and
- solve workplace health and safety issues.

2.1.1.1 MEMBERSHIP

The Committee is formed from employer, contractor and worker representatives:

- there should be a similar number of representatives from each group;
- the term of office of a OHSC member should be no longer than three years;
- a chairperson should be elected from within the members each year;
- a secretary should be elected from within the members each year;
- if an employee representative resigns, the replacement should be from the same work group; and
- all management representatives should be filled by a person chosen by management.

2.1.1.2 MEETINGS

The OHSC should meet on a regular basis with no more than three months between meetings.

2.1.1.3 AIMS AND OBJECTIVES

In general the OHSC:

- may consider everything relevant to safety, health, welfare and rehabilitation;
- check if the company is meeting the requirements of appropriate Acts, Regulations and Legislation;
- gather, review and communicate Occupational Health, Safety and Welfare Policies, Plans and Procedures;
- consider any changes to Occupational Health, Safety and Welfare Policies, Plans and Procedures that may affect the workers;
- develop a team work approach within the workgroup and ask workers to stick to policy;
- ask workers help plan and put in place Occupational Health, Safety and Rehabilitation Policies;
- decide on the way workers talk to each other within the workgroup;
- tell management of any problems with Occupational Health and Safety Procedures; and
- recommend any training of employees in health and safety.

2.1.1.4 OTHER ACTIVITIES

The OHSC may:

- call special meetings to consider important matters;
- appoint sub-committees, working groups, delegates and other groups or persons to help OHSC activities; and
- ask for help from persons who have skills and abilities, which may help meet the aims of the OHSC or subcommittees. These persons would generally have no voting rights.

2.1.1.5 DUTIES OF OFFICERS

The chairperson

- Should be at all meetings of the OHSC and keep order. When minutes are agreed, the chairperson should sign the minutes at the meeting.
- Should make sure the decisions made in the meeting can be carried out under the “terms of reference” for the committee.
- If there is an emergency, the chairperson should make decisions with the Occupational Health and Safety Representative and Management. Any actions are to be reported to the next OHSC meeting.
- If not at a meeting, another chairperson should take over for that meeting.

The secretary

- Attend all meetings of the OHSC.
- Take notes during the meeting and keep a copy.
- Take notes on what was said in the meeting and any actions to be taken. Make sure everyone on the committee gets a copy.
- Prepare and send out an agenda for each meeting at least five days before the date of that meeting.
- Keep up to date the information on the Health and Safety Acts and Regulations, Codes of Practice and other important material.

- Send reports on accidents/incidents, rehabilitation and current activities.
- Provide advice on changes in standards and legislation.
- Check that agreed processes are working as planned.

Quorum

A quorum is the number of members that must be at the meeting for it to be held. It should consist of not less than half of the employee and/or contractor representatives and half of the management representatives. At OHSC meetings, there should be the same numbers of employee representatives or more than that of management.

The chairperson/secretary may be counted as a member in a quorum.

Requirements of OHSC members

- Must behave at all times.
- Items discussed in confidence within the OHSC will not be mentioned out of meetings.

Replacement of OHSC members

The office of OHSC members may become vacant if a member is:

- no longer employed by the company;
- permanently unable to work because of ill health;
- absent without apology for a number of meetings; and
- no longer the elected representative of one of the management or employee/contractor groups.

Observers

- Observers may include:
 - interested employees; and
 - health and safety consultants.
- Have no right to debate or vote on any committee matter.
- If observers wish to attend a meeting, they should tell the chairperson before the start of the meeting.

- The chairperson should be told prior to the meeting if an observer needs to address the meeting on an item. The chairperson should put this request to the OHSC.

Guests

- Guests with relevant expertise may be invited to attend specific meetings.
- Guests have no right to debate or vote on any OHSC matters.

2.1.1.6 DISTRIBUTION OF MINUTES

Minutes should be sent within one week after the meeting. Should a meeting be stopped and restarted, then minutes should be sent one week after the final meeting.

The secretary or other appointed person should send the minutes to:

- HSC members;
- responsible officers;
- managers/supervisors;
- health and safety representatives (HSRs); and
- notice boards.

2.1.1.7 MEETING AGENDA

Agendas include what will be discussed at the meeting and should be prepared by the secretary and sent at least one week before the meeting date.

A typical agenda could include:

- apologies for non-attendance;
- minutes of the previous meeting;
- business arising from the minutes;
- documentation review;
- correspondence and training;
- safety reports on hazards and problems, outstanding safety item reports etc;
- accident/unusual incident report/rehabilitation;
- human resources/maintenance reports; and
- any other business.

2.1.2 TOOL BOX MEETINGS

Tool box meetings are group talks between management and workers. They give the workforce the chance to raise important issues about them and the operation.

Organisation of meetings

Tool box meetings should be held on a regular basis but should be informal. They can be held as the need arises, for example, to discuss an accident or "near hit".

Meetings may be held by managers, supervisors, safety officers, members of an OH&S Committee or at the request of an employee who has an important issue to talk about.

Meetings can be held anywhere so long as people will not be interrupted. Formal meeting rooms are not needed.

Tool box meetings are not meant to be long training sessions but as a time when ideas on a topic can be talked about.

Formal agendas are not usually needed, but the person calling the meeting should have prepared some topics and be able to direct the discussion and bring it to an agreed end.

Records of topics and names of attendees should be kept at all tool box meetings.

Discussion topics include the following:

- recent workplace incidents, injuries, near hits and possible preventative measures;
- raising people's awareness of their responsibilities for working safely, for example attention to housekeeping, wearing of personal protective equipment;
- inviting people to raise safety issues which are a concern;
- workplace modifications, new plant or equipment;
- people not turning up to work;
- how to lower injuries;
- employee input into lowering manual handling problems or modifying jobs to reduce potential risks;

- workplace safety topics such as hazardous substances, permits to work, warm-up exercises, sun exposure; and
- incident reports from outside sources.

Involving workers in matters about their jobs and their workplace goes a long way towards building a committed and productive team. Input from the workforce is of great benefit to management in planning and problem-solving. The workers are the people doing the job, so they are in the best position to come up with right answers.

2.1.3 OTHER CONSULTATIONS

Areas of management/employee consultation should include:

- preparing Occupational Health and Safety policies and procedures;
- occupational health and safety training;
- accident and incident investigation;
- workplace/hazard inspections;
- preparing written safe work practices;
- change which may greatly affect health and safety at work, for example in procedures, equipment or ways of working;
- employer's arrangements for getting competent people to help satisfy health and safety laws;
- information that employees must be given on the likely risks and dangers in their work, measures to reduce or get rid of these risks and what they should do if they have to deal with a risk or danger;
- planning of health and safety training; and
- health and safety issues of new technology.

2.1.4 COMMUNICATION SYSTEMS

Two-way communication is an important part of an Occupational Health and Safety Management System. Good communication is the key to understanding OH&S issues that affect employees, managers and the community.

What kind of information?

The huge amount of information available can result in "information overload", so it is important

to be selective. There is a need to determine the type of information that is useful, and the way it is presented. A highly technical report could be full of important information, but if the words are too technical, only a few people might understand it.

Where will the information come from and how?

Commonly used types of communication are:

- newsletters;
- bulletins;
- critical incident reports;
- signs;
- notice boards;
- manuals;
- safe work procedures;
- meetings;
- videos;
- reports; and
- safety committee minutes.

It is important to have a communication system, otherwise people who should get the information may miss out. Making sure people understand the information is also important. Reading difficulties and language problems may have to be overcome by having the information read out or translated. This can be important when employees have to follow safety or emergency procedures.

Occupational health and safety information is also available on the Internet, e-mail and other computer systems such as Infosearch, Chemsearch and CC Info.

Day-to-day communication

Mine personnel need to understand what has been said or written. One way to do this is to check with the other person by asking questions or repeating the information. If listening is difficult in noisy or busy areas, move to an area where people can really listen.

Management's role

Managers must set up a culture for safety in their areas of responsibility by making a point of talking about safety topics during site visits

and by having safety as an item on the agenda at management meetings. When employees keep hearing the safety message from their managers, they know it is important and part of the way things are done.

2.1.5 COMMUNICATION OUTSIDE THE ORGANISATION

Standards and guidelines that affect OH&S are available for the public to read before they are finished.

Comments are also asked on proposed legislation and codes of practice. Industry associations, trade unions, local OH&S authority journals and newspapers are good ways to find out about these documents.

Communication

Communication is not just about sending memos and reports, it is about talking-giving and getting messages which are understood. This is important to provide a safe and healthy place to work.

REFERENCE DOCUMENTS

“Occupational Health and Safety Resource Manual”, QuarrySAfe Group Health and Safety, South Australia.

“Occupational Safety and Health – Information, Education and Training”, Article 24.5, North American Occupational Safety and Health Week.

“Occupational Safety and Health – Manager and Employee Commitment”, Article 24.3, North American Occupational Safety and Health Week, Canadian Center for Occupational Health and Safety.

“A Basic Occupational Health and Safety Program”, Canadian Center for Occupational Health and Safety.

“Boral OH&S Manual”, Boral.

“Consulting Employees on Health and Safety – A Guide to the Law”, Health Safety Excentive, United Kingdom.

2.2 SAFE OPERATING PROCEDURES

For good health and safety, there needs to be a process set up for identifying and assessing risks, and then developing measures to control these risks. One of the most important controls is to prepare work tasks, work instructions and technical rules. These help to make sure that planning is done and that there are written instructions on how to do the job because a lack of control could cause safety problems.

2.2.1 PROCESS CONTROL

Safe work procedures should be set up for the operation of all machinery and tasks that could cause safety problems.

Mines should look at potential hazards and assess the risks of work processes. Written procedures and work instructions are then developed to manage work processes, plant, equipment and materials in a safe way. Employees who do the tasks should help develop the procedures.

The written procedure should contain clear and easy-to-understand instructions. Workers will not always follow written rules. This is because the rules may not be sensible. Procedures must be correct, completed and able to be used.

A method of setting up standard operating procedures for a job is to do a Job Safety Analysis (breaking down every job into small tasks). From this process safe, work procedures can be developed.

2.2.2 JOB SAFETY ANALYSIS

Job Safety Analysis (JSA) is an important part of a safety program for stopping work accidents and illnesses. It is about looking at each job to identify and assess hazards and set up safe work practices.

The JSA technique is good way of getting employees to take part in assessing safety and reducing accidents. Through JSA, workers can make play an important part in setting up and maintaining safe work procedures. It is also a part of “consultation” which may be in legislation.

2.2.2.1 DESCRIPTION

A “job” is a number of steps done in a set order to do the task.

JSA breaks a job down into steps and lists any hazards or risks which might be found in each step. This is done so that the hazard can be found and controlled.

The four basic steps to completing a JSA are as follows.

- Choose the job to be assessed.

In choosing which jobs should be looked at, it is useful to begin with those jobs that have a high accident rate or where a high risk is present. “New jobs” should also be looked at because they will have no accident history. The potential for accidents or work-related illness may not be found unless a JSA is done before the new job is started.
- Work out the job steps or stages involved.

In working out the job steps, it is useful to “work through the job”, list each step and make notes of what is done. Use a Job Safety Analysis form to do this.
- Look at a person while they are doing the job.

The stages of the job can then be looked at step-by-step to identify any hazards. Write down any hazards that you find.
- Find hazard controls.

For each hazard found, write down the controls that need to be put in place to stop the hazard from causing an accident.

2.2.2.2 PURPOSE

When the JSA has been done, it can be used tell the worker how to do the job, and is ideal for training, since it shows an worker how to do the job in the best and safest way. It also sets the standard for the job so that everyone learns to do the job in the same safe way.

The JSA can help managers and supervisors learn about the jobs to be supervised, even if they have not actually done all the jobs themselves.

The finished JSA is a record showing that the company has completed hazard identification, assessment and control.

The JSA should be used as a checklist when doing safety inspections or audits, as it tells the auditor what should be happening on any job.

The JSA provides a “measure” during any incident investigation, as it sets out how the job should be done.

Workers will take more interest in a job if they are asked to help with the JSA. Workers might have good ideas on how to do the job safely and better ways to do the job safely, for example:

- some part of the workplace may need to be changed (materials, lighting, work area layout, ventilation, safety gear);
- the number of times the job is done may need to be reduced; and
- a complete change of the way the job is done might be needed.

2.2.2.3 RECORDS

A copy of the JSA should be kept on the job so it is handy for reference. Another copy should be filed in the office.

Because a JSA produces permanent instructions, it should be a continuing activity. JSAs have to be kept up to date or the benefits will be lost over time. Misinformation or an out-of-date JSA can be dangerous.

Changes may not be needed very often, but when they do occur, everyone concerned with the job should be told of the changes and instructed in the new procedures.

The JSA for a particular task should be repeated if:

- an accident occurs on a job covered by a JSA;
- a job method is changed;
- a job process is changed; or
- a safety inspection shows that the job is not being performed according to the JSA.

2.2.2.4 PITFALLS

There are three main problems in doing JSAs that could prevent them being useful. These are:

- not listing all the hazards;

- listing the hazards, but taking no action; and
- making unclear instructions.

2.2.3 SAFE WORK PROCEDURES

It is the employer’s job to provide the employee with safe work procedures, and with education, training and supervision.

A manual handling job should have its own safe procedure. Some safe procedure steps include:

- the task should be planned before work begins;
- employees should be trained in the skills needed;
- employees should be told about hazards;
- the area should be cleared to avoid bumping into or tripping over things; and
- suitable safety clothing should be given to workers and worn by them.

Safe work procedures should reduce lifting, carrying, pushing, pulling, lowering, throwing, holding, or tasks using force. They should:

- remove unnecessary tasks;
- prevent double handling;
- prevent heavy carrying;
- provide rest breaks during heavy or repetitive work;
- provide shelf storage for heavier objects at waist level, smaller objects on high or low shelves; and
- provide such mechanical aids as trolleys, hoists, levers, adjustable height workbenches and seating, hooks and jacks, tools and equipment kept within easy reach.

Specific tasks may be:

- lighten loads (break loads into smaller amounts);
- reduce bending, twisting, reaching movements;
- use two people to carry bigger loads; and
- prevent muscle strain and fatigue. This includes warming up before working, allowing time for rest breaks and time to gradually get used to a new job.

Statistics show that most people who get back strains are below the age of 20 or above the age of 60. For workers below the age of 20, the cause is generally inexperience and lack of supervision and training, while for workers over 60, the build-up of minor damage and lower physical ability can be the problem. As a rule of thumb, persons should think of other ways of lifting weights more than about 20kg. Reference should be made to the Manual Handling Code of Practice – Worksafe Australia.

2.2.3.1 WRITING SAFE OPERATING PROCEDURES IN PLAIN LANGUAGE

“Plain English” is getting a clear message across to your audience in an appropriate way. This means being clear about what you want to say, who you’re saying it to and how you’re going to say it.

Plain English means:

- considering the reader;
- communicating a clear message to the reader;
- using clear and simple language; and
- rethinking how information is provided to get the reader’s attention;

Plain English does not mean:

- writing in simple English;
- using the minimum amount of words;
- getting rid of technical language;
- talking down to the reader; or
- losing meaning;

Plain English has many benefits:

- workers are more likely to read and act on written texts;
- readers are less frustrated and view documents in a positive way;
- there is less interruption to work from queries and misunderstandings;
- documents take less time to produce;
- safety and quality can be improved; and
- training is easier and more timely.

Audience:

Keep in mind the people who are going to read the material, and consider these questions:

- How well do they read? (educational background).
- Are they from a non-English-speaking background?

Seven ways to write effectively:

There are seven ways to write work-method statements in plain English so they are easier to write and understand.

1. write out the job procedure step by step;
2. use an active voice;
3. sequence ideas logically;
4. keep sentences short and clear;
5. choose words carefully;
6. use verbs not nouns; and
7. consider layout and formatting.

1. Write out the job procedure step by step

- start each step with an action word; and
- set it out as shown in the procedure section of the Suggested Pro forma.

Example 1:

1. Deliver all nails to the site
2. Store in areas set aside by the builder
3. Clear work area of all obstacles
4. Join timber on the floor in lengths less than nine metres.

Example 2:

1. Locate centre of each hole
2. Check that each hole would only enter the slab thickness
3. Drill an 8 to 10 mm pilot hole
4. Insert a small wire or rod through each hole.

Example 3:

1. Erect and brace columns
2. Erect and brace beams
3. Tie beams and bracing
4. Bridge purlins
5. Tension bolts.

2. Use active voice

- It is more personal and direct and says who must do the action.

Examples:

- ✘ Materials must be removed in manageable lots.
- ✓ Remove materials in small lots.
- ✘ Protective gloves are to be worn.
- ✓ Wear protective gloves.
- ✘ Fork lifts must not be driven faster than walking speed.
- ✓ Never drive forklifts faster than walking speed.
- ✘ Leads are to be kept above floor level.
- ✓ Keep leads above floor level.
- ✘ All equipment to be checked and tested.
- Check and test all equipment.

3. Sequence ideas logically

- Put the main idea first.

Examples:

- ✘ When you are working in a dusty and windy area, wear safety glasses.
- ✓ Wear safety glasses when you are working in a dusty and windy area.
- ✘ From the information on the plan, establish the required width of the formwork.
- ✓ Set up the required width of the formwork from the instructions on the plan.
- Put the time phrase, if important, as a subheading and then the instructions in point form underneath.

Example:

- When cutting, drilling or shaping glasswool insulation:
 1. wear protective clothing;
 2. use a suitable dust mask; and
 3. avoid contact with your eyes.
- Try to put information in point form for clear and easy reading.

Example:

- ✘ When compressed air jackhammers are to be employed for the purpose of excavation, it is advisable to make certain that the air compressor is placed within as close a proximity as practicable to the worksite and all equipment is to be fitted with suitable apparatus for noise abatement. Hearing protection is to be worn by all employees at all times and air hoses are to be fitted with snap-on safety couplings which are to be fixed to the hose by the use of safety locking pins.
- ✓ When using jackhammers for excavation work:
 1. place the compressor as close to the work as possible;
 2. make sure that the equipment is fitted with noise controls;
 3. wear hearing protection;
 4. use snap-on safety couplings on all hoses; and
 5. fix safety couplings with safety locking pins.
- Separate extra information that may be needed to make the instruction clear. Do this by putting the extra information in a highlighted box or by using italics.

Example:

Block off fixed-type laser beams by using a beam stop.

Safety Note:

- Effective beam stops have a matt finish to stop reflection. Earth, wood plywood, brick, mortar, concrete or plasterboard surfaces are suitable.

- Roughen the surface of metal beam stops.

Use parallel structures—that is, use the same grammatical structure to express similar ideas or two or more ideas in the same sentence.

Example:

- ✘ To prevent falls:
 - fix solid one metre high guard rail
 - workers must use a safety harness
 - workers wearing safety footwear
 - securely covering all floor penetrations
- ✓ To prevent falls:
 - fix solid one-metre-high guard rail
 - use safety harness
 - wear safety footwear
 - cover all floor penetrations securely.

4. Keep sentences short and clear

Remember:

- Long and/or complex sentences are more difficult to understand. They take longer to read and can hide information.
- A sentence should contain only one or two ideas. Separate ideas with lists, dot points and punctuation (commas, semi-colons, colons).
- If you must have a long sentence (more than 18 words), follow it with a short one.

Example:

- ✘ The trainer will ensure that each crane driver/chaser is fully skilled in lifting procedures and, most importantly, will confirm that each crane driver/chaser fully understands what his duties are.
- ✓ Trainers must make sure that crane drivers/chasers:
 - (a) know correct lifting procedures
 - (b) understand their duties.

5. Choose words carefully

- don't use too many formal words or long-winded phrases.

Examples:

- ✘ ensure
- ✓ make sure
- ✘ accordingly
- ✓ so
- ✘ without further delay
- ✓ immediately
- ✘ at this point in time
- ✓ now.
- Avoid unnecessary repetition or redundancies.

Examples:

 - ✘ Power to the construction site is available on an around the clock basis.
 - ✓ Power to the construction site is available 24 hours a day.
- Do not use too many nouns together. They can make the document difficult to understand because the reader must take in a lot of information.

Examples:

- ✘ safety regulation handbook
- ✓ handbook of safety rules
- ✘ estimated monthly attendance performance bonus
- ✓ monthly attendance bonus.
- Avoid jargon, slang, idioms, sexist or racist terms and foreign expressions.

Examples:

- 1 chippie, sparky, gofer
- 2 I'm broke
- 3 as slow as a snail
- 4 foreman
- 5 deja vu.

- Do not use contractions (short forms). They are not as strong as the words written in full.

Example:

- ✘ Don't
- ✓ Do not

- Beware of acronyms (words made from initials). You must explain what they mean the first time you use them.

Example:

Construction, Forestry, Mining and Energy Union (CFMEU).

- Spell out abbreviations to avoid confusion whenever possible. If you must abbreviate:
 - > do so only when necessary, and
 - > make sure that the abbreviations are understood.

Examples:

- ✘ e.g.
- ✓ for example
- ✘ i.e.
- ✓ that is:

- Spell out one, two, three, four, five, six, seven, eight, nine and ten. Over ten, use numbers – 11, 12, 13.
- Use spelling from the Macquarie Dictionary. It is the most suitable for Australia.

6. Use verbs, not nouns

Be careful of turning verbs into nouns (nominalisation). This makes the document “heavy” or “academic” and hard to read.

Examples:

- ✘ Utilisation of backhoes on construction site must only be done in consultation with supervisor.
- ✓ Consult supervisors before using backhoes on construction sites.
- ✘ Failure to comply with these directives will result in expulsion from this facility and/or notification of the construction company.

- ✓ We will expel you from this site and notify the construction company if you do not comply with these directives.

7. Consider layout and formatting

- Keep your layout open. Use plenty of white space. This makes the procedure more readable.
- Use no more than two separate font styles: one bold and the other Italic. If you use more, the finished product will not present well.
- Avoid using CAPITALS to write full words – THEY ARE MORE DIFFICULT TO READ.
- Do not use underlining. Make important headings larger.
- Justify (line up) the text to the left as this helps you to read the document more easily.
- Take care with the length of lines. 50 to 70 characters is the ideal number of characters per line.
- Use subheadings to help break up large blocks of text and guide the reader to the information.
- Use colour sparingly. It is harder to read than black and white.
- Make sure graphics are easy to understand.
- Keep layout consistent in the document.
- If you need to include a glossary of technical terms, make sure that you follow the agreed layout.
- Finally, get somebody who does not know the job to read it. You have achieved a satisfactory result if they understand it.

2.2.3.2 ALTERNATIVES TO WRITING

It is very important to consider alternatives to writing if you have employees who have reading problems. They may not be able to read words but they may be able to follow a picture, a diagram or spoken instructions.

Use alternatives to writing to make the meaning clearer:

- flow charts for writing work instructions and procedures, explaining processes, defining production goals;
- diagrams, illustrations, graphics, line drawings for technical terms and procedures;
- tables, charts, graphs (pie, vertical, line etc.) for statistics, production data figures; and
- maps for emergency procedures, locations and layout of areas.

Or

Read the information to workers and check that they have understood it. Make sure that they then sign it.

REFERENCE DOCUMENTS

“Create Effective Operating and Maintenance Procedures”, William G Bridges, Thomas R Williams. JBF Associates Inc.

“Guidelines for Writing Work Method Statements in Plain English”, NSW WorkCover, August 1998.

“QuarrySAfe” Occupational Health and Safety Manual, QuarrySAfe Group Health and Safety South Australia.

Job Hazard Analysis, U.S. Department of Labor, OSHA 3071 – 1998.

2.3 WORKPLACE INSPECTION

Inspection is one of the best tools to find problems and assess risks before accidents occur. A well – managed inspection program can do the following:

- Identify potential problems. Standards overlooked during design, and hazards not discovered during job/task analysis, become apparent when inspecting the workplace and workers.
- Identify defects in equipment. The causes of these problems are normal wear and tear, and abuse or misuse. Inspections help managers find out if equipment is getting worn or is inadequate or has been not been used properly.
- Identify poor work practices. Since inspections cover both conditions and practices, they help managers spot poor work practices.
- Identify effects of changes. Processes can change from the original design. As different materials become available, or as original materials are hard to get, changes are made. Changes can occur gradually and their effects may go unnoticed. Inspections give managers the chance to check on materials used and current problems.
- Identify inadequacies in actions taken to fix a problem. Actions are usually taken to fix a specific problem. If the actions are not properly done, they can cause other problems. Also, the original problem may not be fixed. Inspections should be done to follow up on how well the actions are working.
- Check that the standards are being followed. The inspection is an excellent opportunity for measuring performance. It provides a way of checking that things are being managed, for example:
 - the equipment is in good condition or parts are about to break down;
 - efficient layout or poor use of space;
 - tools in order, or scattered about and must be searched for when needed;
 - materials are ready for use or buried under things;

- a safe work area or one with hazards; and
- a clean work area or one that will require a clean-up.

- Show commitment through involvement. Every manager should check the workplace regularly to see that people have the things they need to get the job done.

Inspection activities are a good way of showing employees that their safety and health are important. When management makes regular safety tours, and when the supervisor does informal and formal inspections, workers know that they care. Workers can play a part by being involved in the safety program.

Two broad categories are “informal” inspections and “planned” inspections. Both are important. They are discussed below, with major emphasis on planned inspections.

2.3.1 INFORMAL INSPECTIONS

Informal inspections are simply workers being aware of others as they go about their day-to-day activities. They can spot potential problems as changes occur and work progresses.

Informal inspections have limitations. They are not systematic. They miss things that take extra effort to find. Managers constantly have things on their minds. Preoccupied, they don't realise what they are seeing. They may notice some things, but not the total picture. They may forget to follow up. To overcome this problem, some managers carry a pocket notebook to make notes on things to check and actions to take.

Some companies have formalised the informal inspection by setting up a hazard reporting system.

2.3.2 PLANNED INSPECTIONS

Informal inspections may not be enough. They do not meet all needs for inspection. There are also critical needs for planned inspections, such as critical parts/items inspections, housekeeping evaluations and general inspections.

2.3.2.1 CRITICAL PARTS/ITEMS INSPECTIONS

Critical parts or items can be defined as parts of machinery, equipment, materials, structures or other components that result in a major problem or loss when worn, damaged, misused or improperly applied. If in use, it is a critical part. If in storage, it is a critical item. For instance, a grinding wheel is a critical part when on the grinder, but it is a critical item when in storage because it requires special care.

Look out for things that could cause the biggest problems. Supervisors should be able to tell you the parts and items that are most likely to fail and what might happen if they fail. Effective inspection programs make sure that all parts/items are checked and kept in good condition.

No supervisor or manager should leave these inspections to chance. This involves doing a stocktake or inventory, setting up inspection schedules and auditing the inspections.

2.3.2.2 MAKING AN INVENTORY

This involves listing all critical parts and items in areas, structures, machines, equipment, materials and substances used by the company. Many of these issues will come to mind by giving them some thought. An employee who is familiar with the history of the parts and items, including maintenance experience, should do the inventory.

Incident reports, maintenance records, manufacturer's guidebooks, servicing instructions and interviews with employees can help track down the critical parts. Examples might be safety devices, guards, controls, work or wear point components, electrical and mechanical components and fire hazards. Consider those parts and/or exposure that are most likely to develop into unsafe conditions due to stress, wear, impact, vibration, heat, corrosion, chemical reaction and misuse.

2.3.2.3 PRE-USE EQUIPMENT CHECKS

A type of critical parts/items inspection is pre-use checks. Many types of equipment have systems such as controls, emergency controls, lights and brakes that are needed for safe operation. These systems can be damaged between normal maintenance schedules.

Motor vehicles and materials handling equipment such as mobile equipment and cranes are common examples of items that should be checked before use. These checks are usually made at the start of a work shift to ensure safe operation during the shift. The operator usually makes the pre-use check and gives the form to the supervisor who reads it to ensure that the equipment is "fit for purpose" (is working properly). A pre-use check is an important part of the operator's training.

2.3.2.4 GENERAL INSPECTIONS

A general inspection is a planned walk-through of the whole area, looking for any hazard and noting unsafe work practices. Some of the benefits of these inspections are that:

- inspectors give full attention to the inspection. It should be done as something which is part of operational work;
- checklists should be used to make sure that a thorough inspection has been made;
- inspectors should look into closed rooms, small area and at equipment not in use. They look around, behind, beneath and above the work area; and
- reports of findings and recommendations increase hazard awareness, put in place corrective actions and procedures to improve job safety.

General inspections are often made monthly to quarterly, sometimes more often depending on the types of hazards, and the rate at which things change in the workplace. Changes in people, equipment, materials and environmental factors can create unknown situations. The general inspection should be done often enough to keep up with changes. Time between inspections should allow for action to be taken to fix a problem.

Team inspections may involve management, workers and union representatives. Inspection teams often are used for special problems to ensure all the issues are dealt with. Teams may include specialists in quality control, personnel, safety, hazard control, environmental health, fire, security, maintenance and so on.

Conducting the inspection

Here are some key points that will help make inspections more effective:

- Refer to the map and checklist. Be thorough. Follow the planned route so you give each area the full attention and look at the all items. Without checklists, people may become interested in the process and fail to see the problems.
- Note the positive. Make brief notes or list what you have looked at and found satisfactory.
- Look for off-the-floor and out-of-the-way items. Without getting into danger, make sure you get a complete picture of the whole area. Look in closed rooms and cabinets. Ask operators to start up machines not in use (but in workable condition). It is usually items outside normal operations that cause problems.
- Take immediate temporary actions. When any serious risk or danger is found, do something right away. See that the proper supervisor shuts down operations if the dangers are out of control. Put up barriers to isolate hazards. The action should be appropriate to the risk, but should always lower the risk or correct the problem.
- Describe and locate each item clearly. Write down a concise simple description of the problem. Give an exact location. Use correct names and markings to pinpoint locations. Photograph to aid the written descriptions, but always write a full description on the spot. Don't rely on memory or abbreviated notes. Remember, other people may need to locate the item in your absence.
- Prioritise the hazards. This enables managers to give priority in the budgeting of personnel and material resources to the major problems.
- Report items that seem unnecessary. Putting materials where they are needed or exchanging them for resources that are needed helps control costs. Freeing valuable floor or storage space where the items were removed becomes an extra bonus. Removing congestion and possibly interference makes work more efficient and safer.
- Determine the basic causes of substandard actions and conditions. The work is only started when the problems are found. The same things will occur over and over again unless the basic causes of the problems are uncovered. Answer the question, "Why?" Why does the substandard condition exist? Why did the person perform in a substandard manner? Find out the basic causes (personal factors and job factors). Never accept an action to correct the problem without answering the question, "Does it address the basic causes?"

2.3.2.5 INSPECTION REPORTS

Writing a report is an important part of an inspection. The report should communicate information on the hazards found in the workplace.

- The supervisor's inspection report gives feedback on safety problems. It helps workers make better decisions on equipment, materials and people needed to do a job. It also helps make decisions on purchasing, training, safety equipment and changes needed in the workplace.
- Sharing information in the reports can help identify similar problems in other areas.
- The written report is a formal way of letting employees know what needs to be done. The written report prompts people to remember what they have to do, and how to do it.
- The report prompts follow-up actions between inspections.

REFERENCE DOCUMENT

"Introduction to Modern Safety Management (MSM) and International Safety Rating System (ISRS)", DNV Loss Control Management, Australia.

2.4 ACCIDENT INVESTIGATION

While investigation of accidents is generally seen as a reactive process, a precise accident investigation can be an effective proactive way to prevent work-related injury or illness. Accidents are rarely caused by one single factor. Use a formal process to find the facts: interview witnesses, review systems of work and procedures, inspect the workplace and check equipment.

When action is taken to address each of the factors in an investigation, the chances of a similar accident/incident is reduced. It may also be important in preventing accidents/incidents that are different but where similar factors may have played a part. It is important to put time and effort into the accident/incident investigation.

2.4.1 RESPONSE

A company should respond to an accident straight away and make sure the injured worker(s) is (are) taken care of, no other worker is in danger and the area is secure to allow an investigation to start. A company's response to an accident requires a planned procedural approach that:

- considers immediate actions required at the accident scene; and
- sets up a formal process for the investigation.

The company will need to develop its own specific responses beyond these basics. The basics are:

- remove, where possible, any further danger(s);
- provide first aid care or medical treatment for injured/affected personnel; and
- contact emergency services for assistance:
 - ambulance;
 - police;
 - fire authority; and
 - emergency services;
- identify all personnel or third parties directly involved;
- contact essential services if required;

- power;
- water; and
- gas;
- block off, separate and secure the area to restrict access to assist the investigation;
- take immediate action to stop the accident happening again;
- report the accident as required to:
 - the relevant regulatory authority(ies);
 - line and executive management;
 - health and safety manager/coordinator;
 - health and safety representative(s);
 - chief executive officer/general manager;
 - board of management/directors; and
 - unions;
- identify who else needs to be told about the accident;
- visit the injured person(s);
- visit and contact involved person(s) family(ies) or next of kin;
- complete and file the required documentation such as:
 - first aid report;
 - treatment report;
 - compensation document;
 - insurance report documentation;
 - accident report (injury/damage/environment); and
 - statements and investigation reports;
- identify what resources are needed to manage the situation;
- decide who will be involved in the investigation;
- start the documented investigation (ensure all information is referenced so it can be found);
- advise employees of the investigation;
- with discretion, take photographs and/or a video of the accident and area;
- measure and note features of the accident and the surrounding area;

- identify witness(es) name and contact details;
 - list witness(es) details by name and contact location;
 - organise interviews with each witness;
 - start an assessment independent of the investigation to identify:
 - a breach of any legal responsibilities under legislation;
 - a breach of the company's own policies or procedures;
 - potential litigation/prosecution;
 - operational disruptions (short and long-term effects);
 - keep all employees informed of what is happening;
 - respond to the media if required; and
 - organise trauma counselling (if required) for:
 - other people involved;
 - witness(es); and
 - family(ies) or family members.
- correct immediately if possible (ensure compliance);
 - defer the activity indefinitely and await further instructions;
 - consider temporary repair and ensure compliance;
 - assess work alternatives with the work group;
 - assess if the injury-causing task can be completed;
 - assess engineering repair and modification;
 - assess the total system of work for its safety;
 - initiate an immediate preventative maintenance program or upgrade the existing maintenance program; and
 - conduct a total hazard assessment on the specific operation.

2.4.2 WHO SHOULD INVESTIGATE

Which supervisors or other managers should make investigations? Selecting the investigator or investigating team is a critical first step. As with any type of problem-solving, the person with the most interest in the problem is the first choice. There is also another important consideration in the choice of the investigator. The person must be able to work through the investigation without coming to an early conclusion. The findings have to be relevant and consider only the facts or the problem isn't really solved.

Possible choices are: the supervisors, other managers and specialists.

2.4.2.1 LINE SUPERVISORS

Supervisors should be involved in investigations because most of their time is spent solving problems. Other reasons may be:

- They have a personal interest. Supervisors are responsible for specific work and work areas. Supervisors must deal with incidents because they affect the work output, quality, cost and every other part of the workplace.
- They know the people and conditions. Supervisors plan the use of resources

The factors that cause an incident are often unique to the incident, and if any employee is involved, the following should be done from the treatment/accident report:

- a rehabilitation program in line with policy procedures;
- a company should also consider:
 - what information it should tell its customers;
 - competitor comments;
 - negative media attention; and
 - effects on the company's other operations;
- Before restarting operations, consider the following:
 - obtain an OHS authority clearance to continue production;
 - advise other sites if affected by the accident;
 - start any off-site isolation of plant until checked;
 - discontinue the job until the risk(s) are removed;

daily. They make decisions that affect who does what, what training is needed, what standards need to be met and how long the job will take. They know what things influenced other decisions and already know much of the information that an investigator wants.

- They know how and where to get the information. Supervisors know their people, know “who knows what” and what records are kept and where they are. They can get accurate information about an incident quickly.
- They will start or take the action. They can decide what will work and what won’t, and why. They will take better action if they are involved in decisions on how to fix problems.
- They benefit from investigating. There are several benefits.
 - It shows concern. Supervisors who carefully investigate accidents and incidents show their concern for people. Failure to be involved can create serious morale problems.
 - It increases productivity. Work is interrupted first by incidents and then by investigations, emergency actions and actions to remove hazards. If these actions are carried out properly by the supervisors, there is less interruption and less chance of the incident happening again.
 - It reduces operating costs. Injuries cost time and money through people being away from work, production loss, material being wasted and many other issues. Proper investigation will prevent accidents that lower operating costs. Everybody will benefit.
 - It shows that supervisors have control. People go to the managers who have control with their problems and ideas. They follow the instructions of those who are really in charge. Studies of leading companies show that people who work for supervisors who are “in control” take greater pride in their work.

2.4.2.2 MIDDLE MANAGERS

Sometimes investigations involve middle or higher-level managers. Typical situations are when:

- there is a major loss or a high potential incident. It would be unfair to ask supervisors to solve problems beyond their level of knowledge and authority;
- the accident involves other supervisors’ areas. The lowest-level manager should investigate accidents, as a rule; and
- the actions to fix the problem are broad and high in cost. At times, a supervisor will start an investigation only to discover other areas could be affected. The responsibility should then be passed to a higher level of authority that can work out the best way to fix the problem.

In all of these situations, the line supervisors can still give good help. They can be included as members of investigation teams to make the most of their knowledge and skill.

2.4.2.3 SPECIALISTS

Occasionally, special knowledge is needed. This could be because of a new process, equipment failure, use of hazardous materials, or a complicated situation. Parts of the information may need to be obtained or looked at by a technical expert. The experts then become advisers to the investigators.

2.4.3 INVESTIGATION PROCESS

When starting your investigation, you should consider:

- whether you know what records to keep for legal reasons and how long these records should be kept;
- the purpose of your accident investigations;
- whether the purpose been developed and written up suits your business;
- whether to use a standard form for investigation;

- whether all reported accidents should get the same investigation or whether there should be different levels of investigation for:
 - first aid treatment accidents;
 - injury/illness accidents;
 - damage incidents; and
 - near-miss/no visible loss accidents.
- who is/should be responsible overall for the investigation;
- how long should the investigation take from the date of the accident;
- who looks at the investigation to see if the true causes and system failures have been identified;
- how long after the investigation are the workers told, and who gets them;
- who should get the completed investigations;
- where do the completed investigation notes go;
- who is responsible for checking the action from the investigation;
- who is responsible for providing resources for the action;
- what time frame will be allowed for corrective action;
- how you will measure the results of the action taken;
- when should the results be measured (every six months is a minimum);
- whether your investigations find the causes or failures that allowed the accident to happen;
- what information, training and instructions do investigators need so they can:
 - conduct investigations to find the causes, or systems failures; and
 - develop action plans to get rid of the causes or failures;
- how often will the investigation procedure be reviewed; and
- how will any legislative changes be put in place?

2.4.3.1 INVESTIGATING AN ACCIDENT

An investigation is about finding out why an accident happened and how to stop the accident happening again. Investigations must follow a standard procedure to get all of the information.

They will not succeed unless everybody involved believes the investigation is fair and not a threat to themselves.

An investigation must be given enough time to make sure all the information is gathered.

The investigator must tell everybody why the investigation is happening and what it is hoped it will find.

The right questions must be asked to get the right answers.

When asking questions, think about:

- the words in the question;
- why you're asking it;
- at what stage you ask it;
- how you ask it;
- where you ask it; and
- who do you ask.

2.4.3.2 QUESTION TYPE AND EXAMPLE

Overhead question, to open discussion
Where shall we start?

Direct question, to gain information
Were you trained to operate?

Relaxing question, to gain opinion
Would you like to comment?

Reverse question, to encourage thought
Tell me your experiences?

Factual question, to get the facts
Who? What? When? Why? Where? How?

Broadening question, to broaden discussion
What other factors were involved?

Justifying question, to gauge a further perspective
Is that important?

Hypothetical question, to change discussion
Did we ever consider?

Alternative question, to decide an alternative
What is the best solution?

as other problems arise. Checking actions can prevent the incident happening again.

2.4.3.3 STEPS IN INVESTIGATION

- Respond to the emergency quickly. On seeing or being told of an incident, the supervisor should go to the scene straight away. Take charge and give instructions. Keep those who aren't needed out of the area. Decide if emergency care is needed. Decide if people should be removed from the workplace or put back to work. Decide who else should be told about the incident.
- Collect information about the incident. Ask yourself some questions: What appears to have happened? Who should be interviewed? What equipment, tools, materials, or people are missing that should be there? What things might have failed or not operated properly? What do you need to know about training, repair, maintenance and other things that are in records?
- Look at all significant causes. Find out about injury and damage. Then list the actions and conditions that allowed the incident to happen. Finally, trace the job and personal factors for each action and condition. Clearly identify what you know (facts), what you need to find out (gaps) and what you can assume (links).
- Take corrective actions. Systems may need to be shut off or locked out to keep another incident from happening. Barriers may need to be put up. Work orders may need to be written. Recommendations may need to be made for engineering changes, purchase requisitions or a program to stop the incident happening again. Some of these may need approval for funding, hiring or personnel transfer.
- Review findings and recommendations. Every investigation should be reviewed at the next higher level of management. One reason is to check that the problem has been defined and solved. Another is to decide who else should know about it. A third is to find why the safety program has not stopped the hazard.
- Check that the actions were effective. This is to see that the actions don't have unexpected, undesired results. Things are often forgotten

2.4.4 INVESTIGATION OUTCOMES

The investigation should identify and correct accident causes and systems failures. It should look at any areas that require development or change. For example:

- employee induction;
- employee training (job-specific);
- training for supervision;
- standard operating procedure (SOP);
- policy; or
- awareness session for employees/work groups:
 - work layout;
 - material assessment;
 - plant/equipment assessment;
 - safety clothing or equipment;
 - worker selection and placement criteria;
 - job roles and responsibilities; and
 - purchasing standards.

The investigation should also look at:

- records required;
- procedures required;
- maintenance records/schedules;
- fault-reporting systems;
- awareness training;
- job/task training;
- job responsibility/knowledge and competency/skills; and
- checklists and audits in place or required.

2.4.5 CORRECTIVE ACTION MONITORING

After the investigation, a formal system must be put in place to make sure controls put in place to stop the accident happening again are being used. This system could include:

- regular scheduled inspections;
- specific testing;
- specific monitoring;
- specific calibration requirements;
- technical or scientific assessment;
- specific job/task audits/assessments with pre-set criteria;
- survey monitoring;
- regular checklist inspections;
- safe work practice/procedure competency review;
- operator observation/assessment;
- regular operator reporting;
- job compliance and performance assessment;
and
- team work/group responsibility.

REFERENCE DOCUMENTS

“Investigating and Managing Accidents”, Gavin Johnson, Safety News, September 1998, National Safety Council of Australia.

“Procedures for Accident and Incident Reporting and Investigation”, University of South Australia.

“Introduction to Modern Safety Management System and International Safety Rating System”, DNV Loss Control Management Australia.

2.5 EMERGENCY PLANNING AND RESPONSE

2.5.1 EMERGENCY SITUATIONS

An emergency can be described as an abnormal, dangerous or life-threatening situation requiring urgent action to protect people, property and the work area.

Workers must be trained in what to do in an emergency and they must be given the right tools to do the job.

Emergencies could be things that have happened or that might be about to happen, such as:

- serious injury to any person at the mine;
- a fire which is not readily controlled;
- spillage, loss or exposure to hazardous materials;
- a failure of the workings of the mine;
- any person trapped;
- an accidental explosion or ignition of dust;
- shaft and shaft equipment damage or failure;
- out-of-control machinery;
- failure of a dam or tailings storage;
- an inrush of water;
- natural disasters; and
- sabotage.

2.5.1.1 NATURAL DISASTERS

Natural disasters could include:

- earthquake;
- flood;
- storm-rain, wind, lightning strike; and
- bushfire.

2.5.2 RESPONSIBILITIES OF MINE OPERATORS

The mine operator should plan for emergencies and put procedures in place to lower risk to persons.

The mine operator's responsibilities include:

- identify emergency situations, and plan to reduce the chance of an emergency;
- develop and put in place procedures to stop emergencies happening;
- provide measures that will control an emergency;
- provide warning of an emergency;
- provide resources and training for workers to control emergencies;
- clearing the mine or part of the mine in the event of an emergency;
- investigate any emergency and provide a debriefing (including the counselling of persons traumatised); and
- provide a report of every emergency to the appropriate authority.

2.5.3 PLANNING FOR EMERGENCIES

A plan to deal with major emergencies is a part of OH&S programs. The lack of an emergency plan could lead to fatalities, injuries, losses and possibly the financial collapse of the company.

A plan may:

- uncover hazard conditions that could make an emergency worse;
- show other problems such as lack of training, tools and supplies needed to respond to an emergency; and
- show the company is serious about the safety of its workers.

A plan can prevent an emergency being turned into a disaster by:

- panic;
- the need for quick decisions;
- shortage of time;
- poor judgment under pressure;
- lack of resources;
- insufficient training; and
- breakdown of normal channels of authority and communication.

2.5.4 RISK ASSESSMENT

Development of the plan begins with a risk assessment. The assessment will show:

- what sort of emergency could happen;
- how likely it is;
- what can be done to prevent it; and
- what is needed to handle the emergency.

The risk assessment may result in a list, which includes:

- fire;
- collapse of face;
- mobile equipment accident;
- damage, injury, fatality;
- explosion;
- flood;
- chemical spill; and
- lightning strike.

Any of the above could happen alone or be connected. For example, a dump truck hit by lightning might run out of control, fall over an embankment and catch fire, explode and leak hazardous substances.

Emergency plans can be made when the risk is understood. Catastrophic events should be included in a risk assessment. These are events of high consequence and low probability.

Identifying impacts, actions and resources

Before starting an emergency plan, you should think about who should be involved in the planning. This will include those who are to be involved directly in an emergency, plus others who may assist. The list may start with one work team. Then, other groups may be added, such as the mine's OHS committee, the engineering department, electrical employees and so on. You may need to go outside the mine and ask other groups to join the planning process. These could include police, ambulance and fire brigade. The list can include anyone you think might be involved in helping with an emergency.

Having found the hazards, the possible major impacts of each should be listed, such as:

- fatalities;
- injuries;
- sequential events (for example, fire after explosion);
- evacuation;
- damage to plant and buildings;
- loss of vital records/documents;
- damage to equipment; and
- disruption of work.

Based on these events, consider the following:

- declare an emergency;
- sound the alert;
- evacuate the danger zone;
- close main shutoffs;
- call for outside aid;
- start rescue operations;
- attend to casualties; and
- fight fire.

The following list should be considered:

- medical supplies;
- auxiliary communication equipment;• power generators;
- respirators;
- chemical and radiation detection equipment;
- mobile equipment;
- emergency protective clothing;
- firefighting equipment;
- ambulance;
- rescue equipment; and
- trained personnel.

2.5.5 EMERGENCY PROCEDURES

These might include any or all of the following for underground mines only, and some for all mines.

- The evacuation order for alerting workers. One type of signal should be understood and used to clear the mine:

- sirens or fire bells might be used in open-cut mines and quarries. The all-clear signal is less important, since time is not an urgent concern.
- a stench alarm system in the air intake, flashing lights, through-the-earth communications, or a leaky-feeder radio system could be used as a means of evacuating underground mines.
- Emergency escape routes are needed in underground mines and, the direction of the exit clearly marked.
- Workers must be trained to know the escape routes and what to do in an emergency. Escape routes must not be obstructed.
- Safe locations must be named and marked where the workers will gather to be counted to make sure everybody has left the danger area. People must be given the job of helping injured employees in an emergency.
- Injured people must be treated as soon as they can, and efforts made to contain the emergency and search for missing people.
- Alternative sources of medical aid must be planned, in case the normal aid cannot be reached.
- The safety of employees and any other people must come before the protection of property and equipment.
- There should be a plan for the safe shutdown and clearance of the workplace. All employees must be told about the plan, and the details must be displayed where they will be seen. Personnel should be available at the mine to provide first aid treatment to any person suffering accident or illness while at the mine.

When reviewing the mine's preparation for an emergency, think about:

- decision-makers not understanding mines rescue;
- difficulty in keeping experienced mines rescue members;
- mines not being designed to handle fire controls;
- inadequate fire protection systems in mines;

- industry slow to introduce new technology;
- age and poor physical fitness of team members; and
- outdated regulations and plans.
- Possible solutions may include:
 - redefining corporate priorities; and
 - more involvement of managers through consultation with experienced rescue and emergency team members.

2.5.6 WHAT SHOULD BE IN AN EMERGENCY RESPONSE PLAN

The emergency response plan should have specific duties, responsibilities, authorities and resources. Responsibilities that should be assigned are:

- reporting the emergency;
- activating the emergency plan, the mines rescue team;
- taking overall command; • ensuring effective communication;
- alerting staff;
- ordering evacuation;
- alerting external agencies;
- confirming evacuation;
- alerting others out of the mine of possible risk;
- requesting external aid;
- coordinating activities of various groups;
- advising relatives of casualties;
- providing medical aid;
- controlling media and visitors; and
- sounding the all-clear.

External organisations that may be available to assist could include:

- fire brigades;
- mobile rescue squads;
- ambulance services;

- police;
- telephone company;
- hospitals;
- other mine sites;
- government agencies; and
- local businesses.

These organisations should be contacted in the planning stage to discuss each of their roles during an emergency.

For a good emergency response, the employer should:

- develop an evacuation plan and procedure;
- develop specific procedures for an emergency response for specific risks in the workplace (for example: hazardous substances spill);
- put in place and maintain all necessary firefighting and emergency equipment;
- maintain all necessary rescue equipment;
- train all personnel as required;
- provide a large-scale plan of the workplace, including exits, safe evacuation paths, location of fire and emergency equipment and assembly areas; and
- list the local emergency services (fire, ambulance, police, volunteer emergency organisations) and show their direct contact phone numbers around the mine.

2.5.7 TRAINING, TESTING AND REVISION

The mine operator should develop strategies for emergency situations. All workers must be trained and have practised their role in the event of an emergency.

There should be regular training of all employees for all potential emergencies. Training drills make sure workers know what to do; how to raise the alarm, who to contact, know the location and use of firefighting equipment and the location of the emergency assembly area.

Records should be kept of the names of people attending the training, and the date and details of training.

The plan should be reviewed at least annually or when there are changes in plant, processes, materials used and key personnel.

2.5.8 FACILITIES

The standard of facilities for emergency response and the number and level of training of personnel for emergencies, should take into account:

- the number of people, including contractors, who work at the mine;
- the availability of outside help;
- the remoteness of the operation and need for outside services and support;
- particular hazards of the operation; and
- the effect of a site emergency on the locality or region.

Emergency refuges should be placed in underground mines. The refuge should be:

- clearly marked;
- able to be sealed; and
- provided with items such as:
 - water supply;
 - first aid kit;
 - emergency rescue equipment;
 - air supply from the compressed air lines;
 - copy of mine emergency plans;
 - several self-contained self-rescue units; and
 - means of communicating with the surface.

For large above and underground mines, special fire-fighting and rescue crews should be set up and regularly trained. A person with sufficient experience in fire-control, or a person trained in an approved fire control course, should be put in charge of inspecting and ensuring maintenance of all fire and rescue equipment.

Everybody should know where the room is that is used for the safe storage of emergency fire-fighting and rescue equipment. Sufficient equipment should be kept available to meet any emergency.

Sufficient numbers of self-contained breathing apparatus should be kept and maintained ready for use. In underground mines, self-contained self-rescuers should be located in fresh air bases and other locations as thought necessary.

2.5.8.1 OTHER CONSIDERATIONS

Mine operators or local organisations should, where practicable, provide and maintain adequate central rescue stations, fully equipped for rescue work and for the training of rescue personnel.

During a major emergency, consider the following communication issues:

- keeping the media away from sensitive or dangerous areas;
- setting up a fully equipped media room;
- giving the media ID tags;
- issuing frequent press releases at set times;
- providing a trained spokesperson;
- only giving facts; and
- explaining technologies so the media can get the story right.

For family members who are awaiting news, communication and counselling issues should be addressed:

- have a comfortable waiting area;
- provide food, drink and telephones;
- provide an official to stay with them;
- isolate them from the media;
- issue them with ID tags;
- provide trained counsellors;
- give them truthful updates;
- make sure the spokesperson has a “high profile” in the mine;
- answer all questions;
- provide access to medical facilities; and
- control contact with workforce.

For provision of counselling, ensure that:

- it is immediate;
- trained professionals are used;
- there is follow-up;

- there is management support;
- all mines rescue teams used are briefed and debriefed;
- every one is aware that stress causes behaviour changes; and
- critical stress syndrome is included in all emergency plans.

2.5.8.2 RESCUE EQUIPMENT

The following are examples of rescue equipment that may be required for emergencies.

The type of mine rescue breathing apparatus available are:

- closed-circuit oxygen units for underground mines;
- liquid oxygen units;
- compressed air units; and
- self-contained self-rescuer (for emergency only).

Other rescue equipment could include:

- heights rescue; and
- confined space rescue.

2.5.9 FIRE

2.5.9.1 RESPONSIBILITY OF THE MINE OPERATOR

The general manager should:

- provide for the control of fires; and
- develop procedures to ensure the safety of all people in the mine in the event of an emergency.

2.5.9.2 BASIC FIREFIGHTING PRINCIPLES

For combustion to start three basic elements are required:

- oxygen;
- fuel; and
- heat.

The removal of any one of these elements would generally result in the fire going out.

2.5.9.3 CLASSES OF FIRE

Fires are divided into five classes:

- Class A – Fires in which the fuel source is generally carbon compounds which are organic in nature, such as wood, paper and plastics.
- Class B – Fires that involve flammable or combustible liquids or liquefiable solids, such as petrol, kerosene, cooking oils and waxes.
- Class C – Fires involving flammable gases or liquefied gases, such as liquefied petroleum gas (LPG), propane and butane.
- Class E – Fires involving energised electrical equipment, such as circuit boards and electrical appliances.
- Class F – Fires that involve cooking oils and fats.

Fire extinguishers are the first line of defence in a fire, and quick use of the correct fire extinguisher can prevent serious injury or damage. There is no single type of fire extinguisher that can be used for all fires. Refer to Figure 2.1 “Portable Fire Extinguisher Selection Chart” for the type(s) of extinguisher(s) that may be used for each class of fire.

Note: Electrical arcs are not to be considered as a fire. However, they may act as the ignition source for any class of fire.

As an example, explosives would fall into the Class A category and therefore most fire-extinguishing mediums would prove effective.

2.5.9.4 FIRE PREVENTION

Fire prevention measures might include:

- no source of heat or naked flame should be left unprotected close to flammable materials;
- cutting, heating or welding of materials should only be done as specified in AS 1674 Safety in Welding and Allied Processes, or when special precautions are needed;
- explosives should not be fired near flammable materials;
- flammable waste material should not be allowed to gather, but be collected and regularly removed from the mine;

- store flammable and combustible substances in a safe place, such as fire proof cabinets and compounds;
- warning signs which comply with AS 1319 – 1994 “Safety Signs for the Occupational Environment” should be put up to show materials that burn with speed or could cause an explosion;
- provide fire hoses, alarm systems and sprinklers for local building regulations, OH&S legislation, and codes of practice;
- recording of regular checks and maintenance of all fire extinguishers, hoses sprinklers, and alarm systems;
- spills of flammable liquids should be absorbed, or adsorbed and removed from the mine, or drained to a sump for removal; and
- petrol or flammable fluids that may ignite (flash point less than 61.5°C) should not be used for cleaning equipment. If it is essential that a particular fluid be used, then ensure:
 - fire extinguishers are provided;
 - good ventilation is provided to ensure vapours are removed;
 - signs are posted warning of the danger of fire, and
 - work is done away from ignition sources.

All firefighting and rescue equipment should be maintained in good condition.

Programs of routine or specific monitoring to assess any fire outbreaks should be put in place.

2.5.9.5 FIRE CONTROL

Fire control planning and procedures might include the points noted below.

- Plans of the mine showing:
 - the location of fire-fighting equipment;
 - the ventilation directions in the mine; and
 - the location of fresh air bases, emergency refuges, telephones and escape routes in the mine.

- All workers should know of the plans, and a copy should be displayed at the surface brace of a shaft and control room, as well as all emergency refuges. The plans should be used in the training of safety and rescue personnel.
- Fire escape routes and fire service points are kept free from obstruction at all times.
- All company vehicles should be fitted with fire extinguishers.
- Fire wardens should be appointed and trained.

2.5.9.6 FIREFIGHTING EQUIPMENT AND FACILITIES

Basic requirements are:

- for underground operations, a water supply should be available in the headframe, shaft and on each level for emergency firefighting. A reserve of water should always be available;
- fire hydrants should be located at each underground level plat, fresh air bases, and put throughout the mine where flammable materials occur;
- fire hydrants and hoses should comply with AS 2419 Fire Hydrant Installations and AS 2792 Fire Hose – Delivery Layflat;
- fire hose reels should be installed as per AS 2441 – Installation of Fire Hose Reels;
- portable fire extinguishers and blankets should be provided, mounted and signed to comply with AS 2444 – Types of Fire Extinguishers;
- all firefighting equipment must be regularly checked, as required by AS 1851 Maintenance of Fire Protection Equipment, or as required by legislation;
- portable fire extinguishers of various sizes and types should be placed throughout the mine where hazards are identified. Appropriate fire extinguishers should be placed on all mobile equipment; and
- safety clothing required to fight fires should be worn.

2.5.9.7 TYPES OF PORTABLE EXTINGUISHERS

The following types of extinguishers may be available at the workplace:

- Water extinguisher – Colour Code Red
Only for use on fires involving wood, paper, plastic, and other solid combustible material. Stream should be directed at the base of the fire. Do not use on electrical or solvent fires.
- Foam extinguisher – Colour Code Blue
Used on flammable liquid fuel type fires (that is petrol, oils, thinners and solvents). Do not use on electrical fires.
- Dry chemical powder (DCP) – Colour Code Red with a Horizontal White Band
Can be used on all fires, but mainly for flammable liquid fires, and fires involving live electrical equipment. Use with a sweeping motion across the flames. This is a non-conductive extinguishing agent.
- Carbon dioxide (CO₂) – Colour Code Red with a Horizontal Black Band.
Can be used on electrical fires such as on a computer or other electrical instruments.

(For further information, also refer to AS 2444).

2.5.9.8 FIRE WARDENS

Personnel must be trained in the use of firefighting equipment. The number of persons trained will depend upon:

- the nature of the hazards within the mine; and
- the size, location and type of work being performed; and
- the number and mobility of employees.

Fire training should include both training in evacuation procedures and in the use of fire extinguishers, and must be adequate to allow that person to perform their job competently.

Where multi-storey office accommodation exists:

- one fire warden should be appointed per floor (Floor Warden); and

PORTABLE FIRE EXTINGUISHER SELECTION CHART

INDICATOR	CLASS OF FIRE		A	B	C	(E)	F	SPECIAL NOTES
	IDENTIFYING COLOURS	TYPE OF EXTINGUISHERS						
PRE 1995 	Type of Fire		Ordinary combustibles: • wood, • paper, • plastics etc)	Flammable and combustible liquids	Flammable gases	Fire involving energised electrical equipment	Fire involving cooking oils and fats	
EXTINGUISHER SUITABILITY								
TYPE OF EXTINGUISHERS			EXTINGUISHER SUITABILITY					
PRE 1995 		Water	✓	✗	✗	✗	✗	Dangerous if used on electrical fires
		Wet Chemical <i>Vapours can cause respiratory distress</i>	✓	✗	✗	✗	✓	Dangerous if used on electrical fires
		Foam	✓	✓	✗	✗	✗	
		AB(E) Dry Chemical Powder	✓				✗	
		B(E) Dry Chemical Powder	✗		✓		✓	# May be used on small surface fires
		Carbon Dioxide (CO₂)	✗	✓	✗	✓	✓	# May be used on small surface fires
		Vapourising Liquid <i>(fumes may be dangerous in confined spaces)</i>	✓	✓	✗	✓	✗	## Vapourising liquid extinguishers are not suitable for smouldering deep seated A class fires
NOTE	Yellow	Halon	As from 31st December, 1995 halon extinguishers will cease to be a legal extinguisher					
Class 'D' fires (involving metals eg magnesium) - use special purpose extinguishers only								

Figure 2.1 "Portable Fire Extinguisher Selection Chart"

- one head warden should be appointed (Head Warden).

All fire wardens should be trained in the use of the fire protection equipment, including:

- fire extinguishers;
- fire hoses;
- fire sprinkler systems and fire alarm systems; and
- evacuation procedures.

Notices should be posted identifying the fire wardens by name and location. Fire wardens may be provided with coloured or labelled hard hats for easy identification in an emergency.

Everyone about the mine should receive instructions and training in what to do in the event of a fire or emergency. Training should be held at regular intervals to ensure the information provided is up-to-date.

The manager should ensure an emergency procedures policy is provided and all employees know the policy exists.

Properly trained personnel should only undertake emergency rescue.

- what firefighting equipment is available on the site, is more needed, and does it need replacing; and
- is the mine at risk from bushfire.

REFERENCE DOCUMENTS

AS 1674 Safety in Welding and Allied Processes.

AS 1851 Maintenance of Fire Protection Equipment.

AS 2419 Fire Hydrant Installations.

AS 2444 – 2001 Portable Fire Extinguishers and Fire Blankets – Selection and Location.

AS 2792 – 1992 Fire Hose – Delivery Layflat.

AS 3745 – 2002 Emergency Control Organisation and Procedures for Buildings.

“Emergency Planning”, Canadian Centre for Occupational Health and Safety.

“QuarrySAfe – Occupational Health and Safety Resource Manual”, QuarrySAfe Group Health and Safety, South Australia.

“Boral OH&S Manual”, Boral.

2.5.9.9 SPECIAL CONSIDERATIONS

Special consideration must be given to particular fire hazard risks.

- LPG and other gas storage areas must be cleared of rubbish, vegetation or other material that may cause a fire to start.
- Vehicles which are driven in areas where there is long grass or weeds should have heat shielding on their exhaust systems.
- Flammable substance stores and conveyors should be protected from the sparks generated by welding/cutting or other maintenance procedures.

Also consider:

- how far away is the nearest assistance;
- even if it is relatively close, how much water is going to be available to fight a fire;
- how well trained do the workers need to be;

2.6 PURCHASING

Well managed purchasing procedures can avoid many potential safety and health problems. People responsible for selecting goods and services should know that purchasing decisions take safety and health issues into consideration. Preferred suppliers should be considered as a means of knowing the quality of the product.

The best way of making sure safety requirements are part of a formal purchasing or procurement policy is to include the Mine Safety Management System. At very least, the requirements should be written down, sent to all purchasing personnel, and regularly checked to see that the policy is working.

2.6.1.1 POLICY AND PROCEDURES

All related OH&S issues must be identified and addressed before any plant or materials are purchased. This should be written in a policy statement for the operation.

Example of purchasing policy

The company aims to ensure, so far as is reasonably practicable, that all plant and substances used in operational activities are safe for use, handling, processing, storage, transportation and disposal.

It is company policy that, prior to making a decision to purchase, lease or hire significant items of plant, equipment or substances, a review will be made of the health, safety and welfare impacts of the purchase.

This policy also applies to the purchase, lease or hire of items of plant, equipment and substances which could have an affect on the environment as part of company operations.

In addition, plant and substances are to have been tested or examined, comply with prescribed standards, regulations and approved codes of Practice. Material Safety Data Sheets (MSDS) are to be available on site for all hazardous substances.

All purchasing contracts, where used, will have all legislative requirements.

Procedures should include all the usual operational and purchasing requirements. Operational managers, supervisors and employees

who are experienced with equipment, materials or processes should be spoken to. This consultation should look at OH&S problems under normal conditions of use, and under dangerous situations that may be present in the particular workplace.

Information will be gathered about the products available. Requests for information should include OH&S information. (Material safety data sheets must always be requested for chemical substances, and these must be reviewed prior to making a purchasing decision.)

A specification should be written on all occasions. This will vary from several lines on a purchase order for straightforward items to a comprehensive document for major or complex items. The specification should include:

- compliance with the general and specific requirements of legislation (always quote specific sections where applicable);
- compliance with the appropriate government or industry standards and codes (be specific);
- evidence that designs are registered where this is required;
- documentation for the safe delivery, installation, use, operation and maintenance of equipment and materials;
- the availability of training for users and written material to support training; and
- documentation of designer, manufacturer and supplier risk assessments.

A risk assessment based on the available information about the product and the way it will be used in the workplace should be performed.

The assessment of alternative designs, tenders and quotes should consider productivity and price implications regarding the control of health and safety risk. The costs and solutions for risk control after purchase (in-service) will almost always be less favourable than engineering-out hazards prior to purchase.

The product must be inspected prior to the acceptance for delivery, to check its compliance with the specification.

An audit trail must be written down to ensure that all the necessary steps in the procedure are taken.

Where substances are to be purchased for vehicles, maintenance or operational use, the substances should be designated as hazardous or non-hazardous.

Where hazardous substances are purchased, managers/supervisors should ensure that:

- a risk assessment is undertaken that includes finding out if a less hazardous substance can be used;
- controls are in place to reduce exposure;
- all workers are informed and trained;
- upon approval, a Material Safety Data Sheet (MSDS) is obtained before delivery of the substance; and
- the MSDS is provided where the substance is to be used and discussed with employees who will be exposed to the substance.

Once a product, substance or item of plant or equipment has been approved, it should be entered onto either:

- approved “Plant and Equipment Register”; or
- “Hazardous Substances Register”.

The item can then be purchased freely by company personnel, but only for its approved use. If it is to be used for another activity or process, it should be checked for that purpose.

When a register of approved plant and substances is kept, there should be no need to evaluate items for the same use again.

REFERENCE DOCUMENTS

“Boral OH&S Manual”, Boral.

“QuarrySAfe Resource Manual”, Occupational Health and Safety Resource Manual, QuarrySAfe Group Health and Safety, South Australia.

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