

# TOPIC 11

## Summing Up - The Work Process Model

### Quick Find

Now that we've reached the end of this course, it is useful to pull together many of the concepts and practices that we have covered. This can be done very clearly using the Work Process Model.



The work process model shows four key elements which must be in place for safe production to occur.

These elements are:

- competent people
- equipment that is fit for its intended purpose
- safe work practices
- a planned and controlled work environment.

### Competent People

To ensure that competent personnel are carrying out the job, the following processes should be implemented:

- identify what each job entails - what skills and knowledge are required as well as any physical requirements
- select the most suitable person for the job
- provide training, and assess the person's competence
- have the person authorised by the senior management or their representative to do the task
- monitor and evaluate their performance
- provide high quality supervision and support
- identify changes in the job that require further training and assessment.

### Contents of this Topic

- Competent People
- Fit for Purpose Equipment
- Safe Work Practices
- Planned and Controlled Work Environment

If these steps are handled correctly then we can be sure that the personnel who are required to carry out specific tasks will be competent. Although these points are most important for management, it is important that you ensure that you are competent to handle your assigned tasks.

**Note:**

*Remember, never undertake a task for which you have not been fully trained, assessed as competent and where required, authorised by the site's senior management.*

**Fit for Purpose Equipment**

Equipment that is to be used for any given task should be suitable to carry out the job for which it is intended. This means that it should have been designed, tested, installed, operated and maintained in a way that allows it to complete the task safely and efficiently.

It is your responsibility to isolate, tag as Out of Service, and report equipment that for some reason has become not fit for use.

**Safe Work Practices**

Once competent people and suitable equipment are in place, we should ensure that these people adopt safe work practices. This is where job instructions become important. In general, these originate from two sources:

- The Site Safety and Health Management System including the Standard Operating Procedures (SOP's); and
- At the work-site level, such as through a formal assessment by a work crew of the risks involved in a task.

**Note:**

*Ensure that you obtain appropriate Standard Operating Procedures for the tasks that you are expected to undertake.*

**Planned and Controlled Work Environment**

The conditions in the work environment can be divided into two categories. These are:

PHYSICAL	MANAGED
Temperature	Work Schedules
Weather	Communication
Noise	Cooperation
Dust	Work Allocations
Structure	Work Locations

# Summing Up - The Work Process Model

For safe production to occur, it is critical that all of the key elements of 'competent people', 'fit for purpose equipment', 'safe work practices', and 'a planned and controlled work environment' are in place. **If any one of the key elements is missing, safe production cannot be achieved and an unacceptable level of risk has been reached.**

The work process model is a useful way to view your workplace. You should keep the model in mind when you start work on a mine site and check that all of the elements are in place for the work that you do. If they aren't, you must report the deficiencies to your supervisor.

Above all, don't forget that **you are responsible for your safety and for the safety of those working around you.** Do not be a liability, accept your responsibility and help to ensure you work in a safe environment.

### A Final Note:

Now that you will be permitted to enter and work on mine sites, you automatically accept a share of the responsibility for yourself, your workmates and the equipment.

It is up to you, and it is in your interest to ensure that you play your part in helping to set high safety standards and then improve on them. People cause accidents and accidents kill or injure people. Do not be the person who causes an accident.



# KEY TO LEGISLATION

## QUEENSLAND

Reference	Relates to	Legislation Referred to
1	Applicable legislation, acts and regulations	<p>Principle legislation:</p> <ul style="list-style-type: none"> <li>• the Coal Mining Safety and Health Act 1999</li> <li>• the Coal Mining Safety and Health Regulation 2001</li> </ul> <p>Other legislation that applies where the principle legislation is silent (that is, where the principle legislation does not refer to a matter or does not prescribe standards) includes:</p> <ul style="list-style-type: none"> <li>• Workplace Health and Safety Act 1995</li> <li>• Workplace Health and Safety Regulation 1997</li> <li>• Traffic Act</li> <li>• Explosive Act and Regulation</li> <li>• Electricity Act</li> <li>• Environmental Protection Act</li> <li>• Mineral Resources Act.</li> </ul>
2	Obligations of parties	Coal Mining Safety And Health Act 1999, Part 3 – Safety And Health Obligations, Division 1, Preliminary, Section 33
3	Obligations in more than 1 capacity	Safety And Health Act 1999, Part 3 – Safety And Health Obligations, Division 1, Preliminary, Section 35
4	Obligations of people in general	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 39
5	Heat stress	Coal Mining Safety and Health Regulation 2001 Chapter 3 – Surface Mines
6	Safety and Health Management System	Coal Mining Safety and Health Act 1999 Part 4 Division 3 - Safety and health management system 62 (1)
7	Obligations of mining lease holder	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 40

## Queensland Continued

Reference	Relates to	Legislation Referred to
8	Obligations of coal mine operators	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 41
9	Obligations of SSE	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 42
10	Obligations of contractors	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 43
11	Obligations of designers, manufacturers, importers & suppliers of plant	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 44
12	Obligations of erectors & installers of plant	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 45
13	Obligations of manufacturers, importers & suppliers of substances	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 46
14	Obligations of service providers	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 47
15	Mine record contents	Coal Mining Safety and Health Act 1999, Part 3, Division 2, Section 66, 68
16	Definition of supervisors	Coal Mining Safety and Health Act, Section 26
17	Safety & Health Advisory Council	Coal Mining Safety and Health Act, Section 56
18	Other specific requirements	Chapter 2 of the Coal Mining Safety and Health Regulation 2001, sections 71, 94 106, & 141
19	Electrical restrictions	Coal Mining Safety and Health Regulation 2001 Chapter 4 –Underground Mines - Part 4 – Division 1, Section 20)
20	Safety berms & rills	Coal Mining Safety and Health Regulation 2001 Section 139
21	PPE	Coal Mining Safety and Health Regulation 2001 Chapter 2 – Sections 64 & 65

# KEY TO LEGISLATION

## NEW SOUTH WALES

Reference	Relates to	Legislation Referred to
1	Applicable legislation, acts and regulations	<ul style="list-style-type: none"> <li>• Occupational Health and Safety Act 2000</li> <li>• Occupational Health and Safety Regulation 2001</li> <li>• Coal Mine Health &amp; Safety Act 2002</li> <li>• Coal Mine Health &amp; Safety Regulation 2006</li> <li>• Occupational Health and Safety Amendment (Coal Workplaces) Regulation 2006</li> <li>• <b>Note that where any provision of the Coal Mine Health and Safety Act &amp; Regulation is inconsistent with a provision of the Occupational Health &amp; Safety Act &amp; Regulation, the Occupational Health &amp; Safety Act &amp; Regulation prevails.</b></li> </ul>
2	Obligations of parties	-
3	Obligations in more than 1 capacity	-
4	Obligations of people in general	Occupational Health and Safety Act 2000, Clauses 20 (1&2) & 21; Sections 8, 26, 28 and 110 Coal Mine Health & Safety Act 2002, Section 203
5	Heat stress	-
6	Safety and Health Management System	Coal Mine Health & Safety Act 2002, Clause 20 and Section 23
7	Obligations of mining lease holder (Colliery Holder)	Coal Mine Health and Safety Act 2002, Sections 8, 91, 96, 98, 105 and 106
8	Obligations of coal mine operators	Occupational Health and Safety Act 2000 Clause 8 (1&2) Coal Mine Health and Safety Act 2002, Sections 66, 67, 69 and 70

## New South Wales Continued

Reference	Relates to	Legislation Referred to
9	Obligations of Managers	Occupational Health and Safety Act 2000 Clause 8 (1&2), Sections 66, 67, 69 and 70 Coal Mine Health and Safety Act 2002, Part 5 Subdivision 3
10	Obligations of contractors	Coal Mine Health and Safety Act 2002, Section 42, 72 to 74 and 76 Occupational Health and Safety Act 2000, Sections 8, 11, 13, 17, and 110
11	Obligations of designers, manufacturers, importers & suppliers of plant	Occupational Health and Safety Act 2000, Part 2 Division 1 Section 11
12	Obligations of erectors & installers of plant	
13	Obligations of manufacturers, importers & suppliers of substances	Occupational Health and Safety Regulation 2001, Division 2 Parts 98-106
14	Obligations of service providers	Occupational Health and Safety Act 2000, Part 2 Division 1 numbers 1-9 (self employed persons)
15	Mine record contents	Coal Mine Health and Safety Act 2002 Subdivision 7 Part 55 Coal Mine Health & Safety Regulation 2006, Division 1 Part 11
16	Definition of supervisors	Coal Mine Health and Safety Act 2002 preliminary Part 3 Definitions Coal Mine Health & Safety Regulation 2006, preliminary in Definitions
	Supervision arrangements	Coal Mine Safety and Health Regulation 2006 Clause 16 Part 2 number 16
	Coal Competence board	Coal Mine Safety and Health Regulation 2006 Part 8 Division 1-3

# KEY TO LEGISLATION

## New South Wales Continued

Reference	Relates to	Legislation Referred to
17	Mine Safety Advisory Council	<p>Roles are:</p> <ul style="list-style-type: none"> <li>• To establish strategic safety and health direction and goals.</li> <li>• To analyse and review the safety performance of the industry and to provide information to stakeholders so that safety performance can be improved.</li> <li>• To provide leadership to the mining industry to develop safe and healthy workplaces within a framework which:               <ul style="list-style-type: none"> <li>o Encourages innovative and safe technology and processes.</li> <li>o Sets the strategic direction for the industry in developing competent people.</li> <li>o Advances a legislative framework which leads to safe mining practice.</li> </ul> </li> <li>• To encourage a move towards cross-industry and national standards.</li> <li>• To interact with the safety advisory committees to enable them to lead their industry sectors, and to inform the work of the Council.</li> </ul>
18	Other specific requirements	
19	Electrical restrictions	Occupational Health and Safety Regulation 2001, Division 3 Number 40
20	Safety berms & rills	
21	PPE	Occupational Health and Safety Regulation 2001, Chapter 1 Number 15



## GLOSSARY OF MINING TERMS

<b><i>Access Road</i></b>	Normally a road used for light vehicles access around the mine site.
<b><i>ANFO</i></b>	An explosive with Ammonium Nitrate and Fuel Oil as ingredients.
<b><i>Authorised Person</i></b>	A person who has the appropriate competencies and has been authorised by senior mine management to carry out a designated task or operate a specified piece of plant or mobile equipment.
<b><i>Backfill</i></b>	The function of filling old strip cuts after extracting coal.
<b><i>Bank Cubic Metres</i></b>	Measure of quantity, being cubic metres of insitu material prior to blasting.
<b><i>Barricade</i></b>	A structure erected to warn of a hazard and to prevent entry by persons into a particular area.
<b><i>Bath House</i></b>	Facility on mine site for changing clothes and bathing.
<b><i>Bench</i></b>	An elevated horizon within the open cut excavation either being a mining level in the case of a multi seam mine, or an overburden excavation horizon (prestrip bench).
<b><i>Berm</i></b>	See Rill.
<b><i>Bin</i></b>	An elevated or in ground structure to contain solid material.
<b><i>Blasting</i></b>	The process of firing explosives to fracture material to be excavated.
<b><i>Boom</i></b>	Normally refers to the large structure on a dragline that controls the digging action of the bucket.
<b><i>Booster</i></b>	A cylindrical ‘stick’ of explosive used for initiating blast hole explosions.
<b><i>Cable Boat</i></b>	A flat open topped container mounted on skids used for temporarily storing and letting out heavy equipment electrical trailing cable as the machine ‘walks’ or advances.
<b><i>Cable Tower</i></b>	A mobile or permanently mounted pole used for lifting trailing cables in the air in order for vehicles to pass under. Normally mounted in pairs.
<b><i>Charging</i></b>	The loading and preparation of blast holes for blasting.
<b><i>Coal Processing</i></b>	A process of removing stone and other non coal material normally by water and gravity classification to ensure it meets the market coal quality specification.

<b><i>Confined Space</i></b>	<p>Australian Standard AS2865 defines a confined space, but in general terms it includes an enclosed or partially enclosed space that:</p> <ul style="list-style-type: none"> <li>- may be difficult to enter and leave</li> <li>- is not intended primarily as a place of work except for repair or maintenance</li> <li>- presents potential hazards such as engulfment, mechanical hazards,</li> <li>- has a toxic, oxygen deficient or flammable atmosphere.</li> </ul>
<b><i>Continuous Mining</i></b>	An underground mining method that uses a self propelled electrically operated machine (continuous miner) with the coal seam being mined in a series of tunnels generally in a rectangular pattern.
<b><i>Contraband</i></b>	Substance or material that must not be taken onto or down a mine. For example, any smoking materials, electronic gadgets, spark producing materials (aluminium), etc.
<b><i>Conveyor</i></b>	An apparatus used for the transport of material by a continuous belt driven and supported by rollers within a steel frame structure.
<b><i>Crib</i></b>	Lunch or a meal.
<b><i>Cribroom</i></b>	Place to eat.
<b><i>Crusher</i></b>	Machine used to fragment and size rock or coal.
<b><i>Defect Report</i></b>	A written report using a form that is used to formally communicate a machinery breakdown or malfunction to supervisory or maintenance personnel.
<b><i>Dragline</i></b>	Large electrical or diesel powered unit normally used for excavating overburden.
<b><i>Drill</i></b>	<ul style="list-style-type: none"> <li>• Overburden Drill - an electric or diesel powered machine used to drill blastholes through the overburden to the coal seam. The holes are then filled with explosives for blasting.</li> <li>• Coal Drill - a truck, wheel or track mounted machine used to drill blastholes in the coal seam.</li> </ul>
<b><i>Drop Zone</i></b>	That area below a suspended load or an elevated work area where any item from may fall to, with the potential of causing injury or damage.
<b><i>Dump Hopper</i></b>	A bin where haul trucks dump their load. (see ROM).

## GLOSSARY

<b><i>Duty of Care</i></b>	For an individual or corporation: ‘to ensure that any act that I do, or do not do, does not harm myself or others’.
<b><i>Earth Leakage</i></b>	An electrical protection system/apparatus that will automatically cut off the power in an electrical circuit when an electrical current ‘leakage’ to ground is detected.
<b><i>EEO</i></b>	Equal Employment Opportunity.
<b><i>Environmental Protection Plan</i></b>	A plan that must be adhered to by all personnel on a mine site. It is aimed at reducing adverse environmental impact on the mining lease and surrounding area.
<b><i>Face</i></b>	The advancing wall from which the coal is mined in either surface or underground mining.
<b><i>Fault</i></b>	A geological structure often causing a break in the continuity of the coal seam.
<b><i>Firing</i></b>	The process of initiating blasting with explosives.
<b><i>Flotation (Cell)</i></b>	The process of separating fine coal from impurities by the use of fine air bubbles and reagents.
<b><i>Guard</i></b>	Mesh or solid shields that prevent people or materials being caught in rotating or moving parts of machinery.
<b><i>Hard Hat</i></b>	Safety helmet.
<b><i>Hard Stand (Go line)</i></b>	An area used for parking mobile equipment ready for use.
<b><i>Haul Truck</i></b>	A very large articulated tractor trailer truck (bottom/belly or rear dump) for transporting coal.
<b><i>Haul Road</i></b>	Road constructed and used for the hauling of coal or overburden from the point of mining to the dump area.
<b><i>Hazard</i></b>	A source of damaging energy over which if control is lost, has the potential for causing harm.
<b><i>Hazardous Substance</i></b>	Any substance that could possibly cause injury to persons, machinery or the environment. An MSDS must be supplied prior to coming on site and at the point of use and storage.
<b><i>Heavy Media</i></b>	A liquid, normally magnetite mixed with water, used to separate coal from stone or other impurities in coal processing.
<b><i>Heavy Media Cycloid</i></b>	A cone shaped apparatus fed by a mixture of coarse coal, impurity (stone) and heavy media solution that separates by a vortex process.

<b>Highwall</b>	The solid advancing wall of an open cut excavation.
<b>Inclined Drift</b>	A sloping, inclined man and material access into an underground coal mine.
<b>Information Tag</b>	A tag used to convey information that should be brought to the attention of personnel working with or around the particular item of equipment.
<b>Isolation (Positive)</b>	Is the process of ensuring that by the act of switching, turning off, separating and locking out, there is absolutely no chance of any particular energy source causing harm to any person or equipment in the vicinity.
<b>Isolation Lock</b>	A personal lock used to ensure that no person can turn on an energy source (using an electrical switch, valve etc) to an apparatus that the person is working on.
<b>Loadout</b>	The facility/apparatus used to load coal into trains.
<b>Longwall Mining</b>	An underground mining method which uses a shearer to remove the coal in 100 to 325 metre slices and a conveyor to remove the coal from the face.
<b>Low Wall</b>	The spoil side of an open cut excavation.
<b>Lube (Service) Bay</b>	A facility where equipment receives lubrication services.
<b>Magazine</b>	A licensed facility to store explosives.
<b>Mine Record</b>	An official record where entries are made by authorized persons of appointments, official inspections, safety works to be carried out and significant incidents occurring on the mine site.
<b>Mines Inspector</b>	Statutory position charged with ensuring compliance with the legislation in surface and underground coal mines.
<b>MSDS</b>	Material Safety Data Sheets for use as an on-job reference to the safe handling, storage, use and disposal of hazardous substances.
<b>Nip Point</b>	Normally associated with conveyors where there is potential for persons or implements being caught and pulled into rollers and idlers.
<b>Obligation</b>	According to legislation, things that you and others must do – and things that you and others must not do - in order to play your part in maintaining a safe work environment. These are known as your legal obligations, and they carry the full weight of the law behind them.

## GLOSSARY

<b><i>Open Cut Examiner</i></b>	Statutory appointments. An employee who possesses relevant qualifications and is appointed by the senior mine manager to inspect open cut excavations for unsafe conditions.
<b><i>Open Cut Excavation</i></b>	Includes the open, below ground level void area and all associated workings for the removal of overburden and coal.
<b><i>Open Pit/ Open Cut Mining</i></b>	Exposure of a large area of coal at any particular time, generally using a combination of excavation equipment.
<b><i>Out of Service Tag</i></b>	Tags that must be placed on the isolation points of defective equipment where, if that equipment was operated, it could cause injury or damage.
<b><i>Overburden</i></b>	Soil, rock and other non-coal waste material overlaying coal.
<b><i>Permits</i></b>	A formal process, using documentation to ensure that all hazards/risks have been assessed and taken into account prior to starting a specific activity. Common permits are: <ul style="list-style-type: none"> <li>• permit to dig (excavations)</li> <li>• permit to move (moving high equipment-cranes etc)</li> <li>• hot work permit (welding/flame cutting in certain areas)</li> <li>• confined space permit access permit</li> </ul>
<b><i>Personal Danger Tag and Lock</i></b>	Individuals must place a Personal Danger Tag and lock on the isolation point for an item of equipment before carrying out maintenance work, checks or servicing, where personal injury could be increased as a result of the equipments' operation
<b><i>Pit</i></b>	A general term designating the mining or mined out area.
<b><i>Pit Floor</i></b>	Bottom (floor) of open cut excavation.
<b><i>Pit Pumping</i></b>	The process of removing water from the mining pit area by diesel or electrically powered pumps.
<b><i>Potable Water</i></b>	Water that is suitable for drinking.
<b><i>PPE</i></b>	Personal Protective Equipment.
<b><i>Preparation Plant</i></b>	Facility for processing coal to remove impurities and size coal to a predetermined specification (also known as a wash plant).
<b><i>Prestripping</i></b>	The excavation of an upper horizon of overburden normally in a deep dragline stripping area.
<b><i>Ramp</i></b>	An inclined road entry into the workings of a surface mine.

<b>Rear Dump Truck</b>	Normally referring to a very large rear dump truck for overburden and short haul coal hauling.
<b>Reclamation</b>	The process of restoring a mined area by recontouring spoil piles to the original or predesigned profiles, and the planting of vegetation to control erosion and to generally promote a stable land form.
<b>Reject</b>	Waste material from coal processing.
<b>Rill</b>	An elongated earth structure constructed to place a boundary over drop offs such as high walls. Also referred to as berms.
<b>Risk</b>	The chance of something happening that will have an impact upon objectives (AS 4360). Risk is measured in terms of consequence and likelihood.
<b>ROM</b>	Run of Mine dump bin that coal haulers dump into.
<b>Safety Harness</b>	A body harness worn by persons in areas where there is potential injury due to falling.
<b>Screen</b>	An apparatus to separate material of different sizes.
<b>Seam</b>	Coal layer.
<b>Sentries</b>	People posted at a safe distance from blasting operations to prevent other people from entering.
<b>Shot</b>	An area that is being prepared for blasting.
<b>Shot Ground</b>	An area that has been fragmented due to blasting.
<b>Shotfiring</b>	The process of breaking rock or coal into smaller pieces using explosives.
<b>Shovel</b>	Large electric or diesel powered unit (referred to as a 'rope shovel' or 'hydraulic shovel' respectively) for loading material into trucks.
<b>Standard Operating Procedure (SOP)</b>	SOPs and supporting documents provide instructions on how to safely carry out specific tasks or operations.
<b>Spoil (Dump)</b>	The deposited overburden waste material, normally located in a mined out area adjacent to the excavation.
<b>SSE</b>	Site Senior Executive
<b>Stacker</b>	A fixed or slewing structure use to elevate a conveyor to load coal or other material onto a stockpile.

## GLOSSARY

<b><i>Stockpile</i></b>	A designated area where coal (or other useful material) is temporarily stored prior to the next stage in processing or transportation.
<b><i>Stop, Trip or Pull Wire</i></b>	A wire running up the sides of a conveyor used to stop the conveyor in an emergency.
<b><i>Store</i></b>	Warehouse or local area used to store and requisition materials.
<b><i>Strip Mining</i></b>	Cutting an elongated trench to expose coal, removing the coal and backfilling with the spoil from the next cut generally using a dragline.
<b><i>Strip Ratio</i></b>	A measure of the amount of overburden that has to be removed to uncover coal in a surface mine. Measured as the volume of overburden (in bank cubic metres), divided by the tonnes of coal uncovered in a defined area.
<b><i>Surface Mining</i></b>	A process of mining requiring the removal of vegetation, stockpiling of top soil, removal of overburden to expose the coal seam by various forms of earthmoving equipment. This method of mining normally results in either long trenches (strip mining) which are backfilled with the overburden from the next pass or cut, or a more extensive open void area being created (open cut or open pit mining) where the overburden may initially be placed in an out-of-pit dump and at a later time within the pit as backfill.
<b><i>Tailings</i></b>	Fine waste material from coal processing.
<b><i>Top Soil</i></b>	The upper most layer of overburden capable of supporting plant life.
<b><i>Trailing Cable</i></b>	A flexible large diameter electric cable used for providing power to heavy electrically operated equipment such as draglines, shovels and drills.
<b><i>Tunnel</i></b>	In surface mines, a 'tunnel' is normally referred to the access under a stockpile.
<b><i>Two-Way</i></b>	A vehicle mounted or hand held radio used for communications around a mine site.
<b><i>Vertical Shaft</i></b>	A vertical or near vertical man and materials access to an underground by means of a cage and winder and/or ladderways.
<b><i>Walking</i></b>	A general term used for the movement of heavy mine equipment from place to place.
<b><i>Washplant</i></b>	See preparation plant.