

CANDIDATE NUMBER:	/ (write in from your letter)
EXAMINATION:	MECHANICAL ENGINEERING MANAGER
EXAM PAPER:	CME1 – Mechanical engineering practices applicable to
	underground coal mines
DATE:	Wednesday 3 rd August, 2022 – 8:50 am to 12:00 pm

EXAMINATION FOR CERTIFICATE OF COMPETENCE TO BE A MECHANICAL ENGINEERING MANAGER OF UNDERGROUND COAL MINES

Issued under the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

INSTRUCTIONS TO CANDIDATES:

Unless otherwise stated all references to Act and Regulations are to the

Work Health and Safety Act 2011

Work Health and Safety Regulation 2017

Work Health and Safety (Mines and Petroleum Sites) Act 2013

Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

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10 minutes reading time is allowed prior to the start of the examination. Candidates can use a **highlighter only** to mark points of importance during the reading time, but may not begin answering the questions. You must NOT use any other writing item during the reading time such as a pen.

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It is expected that candidates will present their answers in an engineering manner, making full use of diagrams, tables, and schematics as appropriate, and showing full workings in calculations. **Poor legibility in diagrams and handwriting** may affect the candidate being deemed competent.

Provide answers in point form wherever appropriate. If you are unable to fit your answers in the available space use the three (3) blank pages included at the end of the paper. Ensure the question you are answering is clearly marked.

All ten (10) questions are to be attempted. All questions are of equal value.

Candidates will be marked as competent, or not yet competent. If a question is identified as **ESSENTIAL** then then the candidate must be deemed competent in that question in order to be deemed competent in the exam. If a part of a question is identified as **ESSENTIAL** then the candidate must be deemed competent in that part in order to be deemed competent in that question.

This examination is a **closed book** examination and no reference material may be used during the exam. Reference material will be provided in the exam paper as applicable.

EXAMINATION BOOKLET

Questio	on Number	Essential	Competent	Not yet competent	Assessed by Name	Comments to justify, as necessary
	а	Elements				
1	b					
	Verdict					
	а					
	b					
2	С					
	d					
	Verdict					
3	a - j					
J	Verdict					
	а					
4	b					
7	С					
	Verdict					
	а					
	b					
5	С					
	d					
	Verdict					
	а					
	b					
6	С					
	d					
	Verdict					

Question Number		Essential	Competent	Not yet competent	Assessed by Name	Comments to justify, as necessary
	а					
	b					
7	С					
	d					
	Verdict					
	а					
8	b					
	Verdict					
	а	Elements				
	b					
9	С					
	Verdict					
	а					
10	b					
	Verdict					
PAPER	Verdict					Marks checked by:

If marking is reviewed under approved processes, then examiner is to record details:

Date	Examiner	Questions reviewed	Marks changed	Details/justification, as necessary
Eg. 2/8/19	Andrew Palmer	All	Q1 – 4 (previously 5)	Found one more criteria



Question 1 – Scenario

Essential Elements

A vehicle collision incident has occurred on site not far from you involving three of your fitters, and you are the first senior statutory official to arrive.

a.	When arriving at ANY incident scene what immediate actions would you take? List you five (5) actions. Two (2) of these actions are considered essential and will be requibe identified in your answer to be considered competent for this question		o
		С	NYC

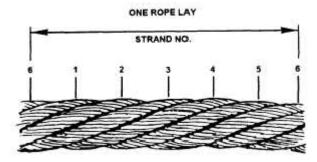
b.	Without disturbing the incident scene, for a collision incident list five (5) items of inform you would make note of for each of the following investigation areas to assist you in assessing the root cause prior to notifying the relevant authorities.	natior	า
People			
		С	NYC
Equipme	ent		
		С	NYC
Environi	mont		
LIIVIIOIII	nent		
		С	NYC

Question 2 – Conveyors		
Question 2 – Conveyors		
Conveyor belts have been used in coal mining for many years for efficient bulk materials hand	ling	
a. Identify three (3) methods for tensioning a conveyor belt system		
		NIVO
	С	NYC
b. For one (1) tensioning method identified above, name the tensioning method, and prov	ide a	
neat sketch of the configuration of significant components		
		ND/0
	С	NYC

	involved, and how the system operates to generate tension in the conveyor belt.		
		С	<u> </u>
		С	1
d.	Describe three (3) reasons why belt tension is required in a conveyor system	С	1
d.	Describe three (3) reasons why belt tension is required in a conveyor system	С	1
d.	Describe three (3) reasons why belt tension is required in a conveyor system	С	1
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d.	Describe three (3) reasons why belt tension is required in a conveyor system	С	1
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d.	Describe three (3) reasons why belt tension is required in a conveyor system	С	1
d.	Describe three (3) reasons why belt tension is required in a conveyor system	С	1

Question 3 - Multiple choice

- a. When testing open joints on the inlet or exhaust system of a diesel engine system, what is the maximum thickness of the feeler gauge that should be used?
 - i. Less than 0.5mm
 - ii. Less than 0.3mm
 - iii. Less than 0.2mm
 - iv. Less than 0.1mm
- b. What factors influence the braking capacity of rubbered tyred mobile plant?
 - i. Tyres with aggressive tread pattern
 - ii. Increasing brake system pressure
 - iii. Decreasing load carrying capacity
 - iv. Dust suppression watering on roads
 - v. All of the above
- c. Which standards define anti static properties the conveyor and conveyor components shall conform to?
 - i. Grade S in AS4606
 - ii. Grade E in AS1332
 - iii. AS1333
 - iv. Any of the above
- d. Any conveyor which can run away due to the effect of gravity shall be provided device(s) which will automatically prevent runaway. Where a hazard to people exists then:
 - i. the anti-runaway device shall be capable of holding 150% of the load
 - ii. the two anti-runaway device shall be capable of independently holding 100% of
 - iii. the two anti-runaway device shall be capable of cumulatively holding 150% of the load
 - iv. the two anti-runaway device shall be capable of independently holding 150% of the load
- e. The rope shown in the picture below is of what construction?



- i. Right hand ordinary lay
- ii. Right hand Langs lay
- iii. Left hand ordinary lay
- iv. Left hand Langs lay

- f. Of the following items of plant used in underground mining which has the highest operating fluid pressures
 - i. Longwall powered roof support
 - ii. In seam gas drill rig
 - iii. Common rail diesel engine LHD
 - iv. Continuous miner
- g. What minimum distance in standards should gas fuel cylinders be stored away from fuel bays, fuel outlets and/or mobile equipment under repair:
 - i. 5m
 - ii. 10m
 - iii. 15m
 - iv. 20m
- h. LPG bulk storage tanks as a minimum require inspection:
 - i. Monthly
 - ii. Annually
 - iii. Every four (4) years
 - iv. At time of manufacture
- i. According to MDG28 what are the recommended methane (CH4) detector set points for alarm and trip in reclaim tunnels
 - i. 0.25% alarm and stop coal feed, 1% trip power to non explosion protected equipment
 - ii. 0.5% alarm and stop coal feed, 1% trip power to non explosion protected equipment
 - iii. 0.5% alarm and stop coal feed, 1.25% trip power to non explosion protected equipment
 - iv. 0.5% alarm and stop coal feed, 1.5% trip power to non explosion protected equipment
- j. What does the term freeboard refer to with respect to belt conveyors?
 - i. The distance the pulley shell is wider than the conveyor belt to allow for some belt misalignment
 - ii. The distance fixed steel work is away from the edge of the conveyor belt to prevent contact during belt wander/misalignment
 - iii. The distance between the centre of the carry belt and the underside of the roof or fixed infrastructure
 - iv. The distance the belt is wider than the conveyed product to prevent lumps rolling off the side

C NYC

Question 4 – Hydraulics

a. For the following table of hydraulic schematic symbols draw a line to link the symbol to the correct component description

Large square or rectangle		Visible indicator or orifice
Large circle		Connectors (hoses, pipes, etc)
Diamond	\Diamond	Rotary motion (pump/motor)
Small circle	0	Pressure / flow control valve
Intersecting lines	+	Fluid conditioning device

C NYC

b. Draw the hydraulic schematic symbol for an open center, three position, lever operated, spring return, directional control valve

C NYC

c. Explain the operation of the hydraulic component depicted by the follows:	wing schematic symbol
	C NYC
	Page 11 of 27

Question 5 – Structural integrity

You are commencing as Mechanical Engineering Manager at an ageing coal mine. The mine has a Coal Handling and Preparation Plant (CHPP) with the following attributes:

- 25 years old
- ROM receival hopper
- Primary, secondary and tertiary crushers
- ROM coal feed conveyor to a plant feed surge bin, then separate conveyor to each module
- Twin 500 tph capacity modules (1000 tph nameplate plant)
- Clean coal conveyors with a tripper skyline
- Reclaim tunnel with vibratory feeder draw points, and a fan on the second egress
- Reclaim conveyor to a train load out bin
- Belt press filters onto a reject conveyor to a reject bin
- Poor housekeeping standards

a.	integrity inspection process	ctura	
		С	NYC

Sitting in the centre of the desk when you arrive is a copy of the annual structural Integrity report dated yesterday, identifying 100 different defects in the following categories:

- Five (5) of Critical ranking
 - 1. Reject bin support leg has been struck by a reject truck (unreported)
 - 2. Spirals support beams have lost 50% of their cross sectional area
 - 3. External sheeting purlins on the plant feed surge bin are almost non existent
 - 4. External sheeting is loose and flapping in high winds
 - 5. Underpans are missing on the skyline feed conveyor above the CHPP access road
- Twenty (20) of High ranking
- Seventy (70) of Moderate ranking
- Five (5) of Low ranking

b.	Based on the above summary what should your top four (4) immediate actions be?		
		С	NYC
		<u> </u>	
C.	What defect items would you prioritise?		
		С	NYC

action	you would cons	ider implementii	ng immediate	ly			
						С	١

Question 6 – Hot work		
Hot work at a mine site is generally managed by the Mechanical Engineer		
a. List three (3) principal hazard management plans or principal control plans that directly manage aspects of hot work	,	
	С	NYC
b. Technical Reference Guide (TRG) Hot Work (cutting and welding) at mines and petrole sites replaced MDG 25 in June 2021. Section 2.3 common hazards of hot work identificators involved singularly or cumulatively in hot work incidents, and also includes a list hazards associated with hot work. List eight (8) hazards associated with hot work.	es	
-	С	NYC

	ork activities. List five (5) controls associated with hot work.		
		1	
		С	
d. I	ist four (4) control requirements for Category C environment welding work.		
		С	

Question 7 - Winders

Work Health and Safety (Mines and Petroleum Sites) Regulation Clause 5 (a) (iii) identifies winders as a principal hazard that may result in multiple deaths from a single incident. Mine shafts and winding systems NSW Code of Practice was released by the Resources Regulator in 2019 to assist mines identify potential hazards and develop controls to safely manage their winders.

- a. Draw the basic layout for a Koepe friction winder, and identify all the components from the following list using the letter associated with each
 - A. Head sheave
 - B. Cage
 - C. Counterweight
 - D. Head rope
 - E. Balance rope
 - F. Guide rope
 - G. Cheese weight

C NYC

b.	What are the factor of safety requirements for the following single line components	?	
	i. Non threaded		
	ii. Threaded		
		С	NYC
C.	What is the factor of safety required for drum winder rope when?		
	i. Newly installed		
	ii. Prior to discard (minimum)		
		С	NYC
d.	Technical Reference Guide: Powered winding systems, Part 4: Ropes, section 5 id nine (9) potential causes of rope deterioration that may either individually or cumula result in the rope being required to be discarded. Identify five (5) of these.		
		С	NYC
			INTO

Question 8 – Energy		
NSW Code of Practice: Mechanical engineering control plan section 3.2.1 identifies energy so associated with plant and structures. Mechanical Engineers at mine sites generally manage al types of energy that are not managed by the Electrical Engineer.	urces I the	
a) List five (5) mechanical energy sources managed by the Mechanical Engineering Mana	ager	
	С	NYC
 b) Select three (3) of the energy sources above and describe a mechanism or scenario the involves that energy source, and how it can be effectively isolated 	at	

С	NYC

Question 9 - Safety critical systems

Essential Elements

The mining industry continues to have reportable incidents with regards to the failure of safety critical systems on mobile plant, and a number of safety alerts have been issued.

	For a standard rear dump haul truck identify four (4) safety critical systems. Two of the safety critical systems are considered essential answers and must be included, are not included the candidate will be deemed not yet competent for the question.	If the	у
		С	N'
b)	Select two (2) of the safety critical systems you identified above, and for each one desthree (3) possible modes of failure.	scribe	
b)		scribe	

		С	N
c)	As the Mechanical Engineering Manager you are reviewing your management systems mobile plant. List ten (10) controls you will ensure you have in place to minimise the pofor incidents involving the failure of safety critical systems.		al

Question 10 - Short answer

a) True or false. Place a 'X' in the box to indicate your answer

	Question	True	False
1	The lower explosive limit (LEL) of methane in air is 4.8%		
2	The locking ring on an earth moving tyre is designed to protect people from rim ejection		
3	Entanglement includes a persons body part being caught and drawn into rotating machinery		
4	Belt wander switches are designed to protect people from being struck by material being ejected from a moving conveyor belt		
5	Fail to safe pnuematically applied brake systems are designed to apply if there is a loss of system air pressure		
6	Floats in the wet scrubber of an underground diesel engine system (DES) maintain the water level so that combustion flames can not exit the vehicles exhaust system into the mine atmosphere		
7	'WLL' on lifting equipment such as monorail beams identifies the working load limit for a vertical point load to the beam		
8	The factor of safety for hydraulic hose assemblies is 4:1		
9	Australian Standard AS1851-2005 states the best practice for maintaining fire protection systems and equipment is that extinguishers should be inspected every 6 months		
10	Safety chains from a collar at the drift winder rope attachment to a dolly car are designed to maintain control of the dolly car in the event of rope failure		

	NIVO
1 0	NYC

b) Pick the standards. NSW Code of Practice: Mechanical engineering control plan section 8.2 identifies reference documents including Australian Standards and guidelines. Select the corresponding Australian Standard number from the list table below to match the Standard title in the answer table, and write the standard number beside it

Australian Standards

AS 1418	AS 1554	AS 1657	AS 1755	AS 1851
AS 2030	AS 2294	AS 2550	AS 2865	AS 3000
AS 4024.3611	AS 4041	AS 4100	AS 4603	AS 5062

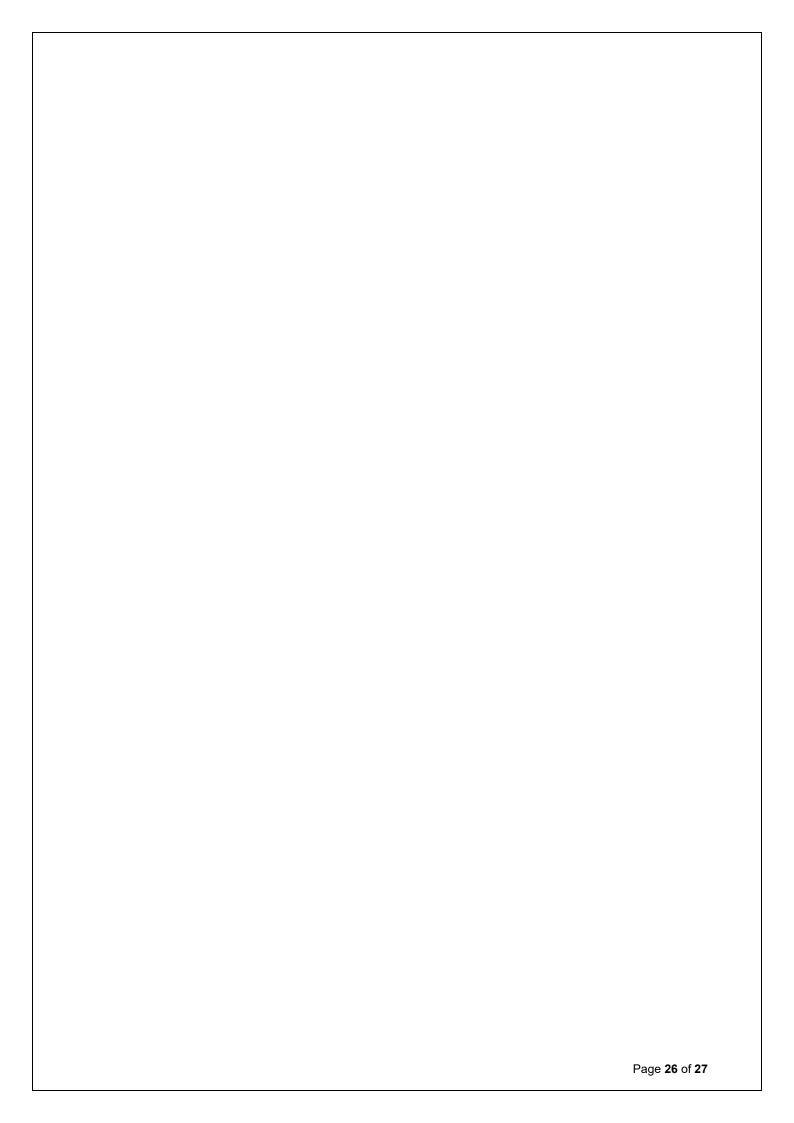
Answer table

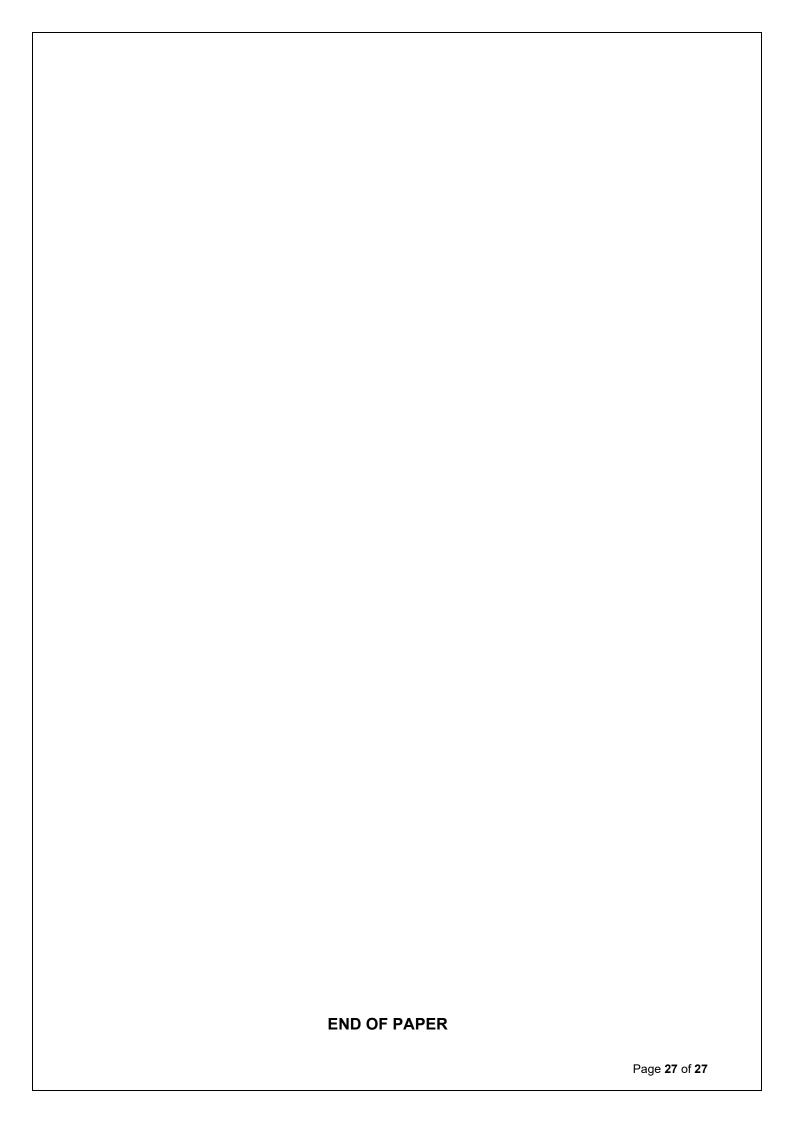
AS Number	Australian Standard Title
	Conveyors – Belt conveyors for bulk materials handling
	Fire protection for mobile and transportable equipment
	Pressure piping
	Structural steel welding
	Fixed platforms, walkways, stairways, and ladders – design,
	construction, and installation
	Steel structures
	Cranes including hoists and winches
	Earth moving machinery – protective structures - general
	Cranes – safe use
	Confined spaces

С	NYC

END OF QUESTIONS

E	LANK PAPER TO WRITE ANSWERS THAT YOU COULD FIT INTO THE SPAC	E
	PROVIDED – INDICATE QUESTION NUMBER AT START OF ANSWER	
	Page 2 5	5 of 27







CANDIDATE NUMBER:	/ (write in from your letter)
EXAMINATION:	MECHANICAL ENGINEERING MANAGER
EXAM PAPER:	CME 2 – Legislation and standards applicable to
	underground coal mines
DATE:	Wednesday 3 rd August, 2022 – 1:10 pm to 3:20 pm

EXAMINATION FOR CERTIFICATE OF COMPETENCE TO BE A MECHANICAL ENGINEERING MANAGER OF UNDERGROUND COAL MINES

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Question	n Number	Essential	Competent	Not yet competent	Assessed by Name	Comments to justify, as necessary
	а	Essential				
	b	Essential				
1	С	Essential				
	d	Essential				
	Verdict					
	а					
	b					
2	С					
	d					
	Verdict					
	а					
	b					
3	С					
	d					
	Verdict					
	а					
	b					
4	С					
	d					
	Verdict					
	а					
5	b					
5	С					
	Verdict					

Question	n Number	Essential	Competent	Not yet competent	Assessed by Name	Comments to justify, as necessary
	а					
6	b					
	С					
	Verdict					
	а					
7	b					
,	С					
	Verdict					
	а					
	b					
8	С					
	d					
	Verdict					
	а					
	b					
9	С					
	d					
	Verdict					
	а					
	b					
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	d					
	Verdict					
PAPER	Verdict					Marks checked by:

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Question 1 – Role of Mechanical Engineer and MECP

Essential

The candidate must be assessed as competent for this question in order to be considered as being competent for the entire exam

competent for the entire exam The role of the Mechanical Engineering Manager Work Health and Safety (Mines and Petroleum Sites) Regulation Schedule 10 Part 2 Underground coal mines Clause 5 Mechanical engineering manager 1) The statutory functions of a Mechanical Engineering Manager are: ___the mechanical engineering standards and a. To procedures forming part of the mining operations at a mine _____ of mechanical plant at the mine b. To supervise the _____ a. What are the four (4) requirements in relation to clause 1) a. above? C NYC b. What are the four requirements in relation to clause 1) b. above?

NYC

Work Health and Safety (Mines and Petroleum Sites) Regulation Clause 26 Principal Control Plans (4) Mechanical engineering control plan The operator of a mine or petroleum site at which there is a risk to health and safety associated with the mechanical aspects of plant and structures at the mine or petroleum site— (a) must (b) must ensure c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C NYC d. According to section 4 (b) what must be ensured, and by whom?				
(4) Mechanical engineering control plan The operator of a mine or petroleum site at which there is a risk to health and safety associated with the mechanical aspects of plant and structures at the mine or petroleum site— (a) must (b) must ensure c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C NYC d. According to section 4 (b) what must be ensured, and by whom?	Work	Health and Safety (Mines and Petroleum Sites) Regulation		
there is a risk to health and safety associated with the mechanical aspects of plant and structures at the mine or petroleum site— (a) must (b) must ensure c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C. NYC d. According to section 4 (b) what must be ensured, and by whom?	Clause	e 26 Principal Control Plans		
structures at the mine or petroleum site— (a) must (b) must ensure c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C. NYC d. According to section 4 (b) what must be ensured, and by whom?	(4)	Mechanical engineering control plan The operator of a mine or petroleum site at which	ch	
(a) must (b) must ensure c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C. NYC d. According to section 4 (b) what must be ensured, and by whom?		there is a risk to health and safety associated with the mechanical aspects of plant and		
(b) must ensure c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C NYC d. According to section 4 (b) what must be ensured, and by whom?		structures at the mine or petroleum site—		
c. Under section 4 (a) what must be done in relation to risks to health and safety from mechanical aspects of plant and structures? C NYC d. According to section 4 (b) what must be ensured, and by whom?		(a) must		
mechanical aspects of plant and structures? C NYC d. According to section 4 (b) what must be ensured, and by whom?		(b) must ensure		
d. According to section 4 (b) what must be ensured, and by whom?				
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d. According to section 4 (b) what must be ensured, and by whom?			ı	
			С	NYC
C NYC		d. According to section 4 (b) what must be ensured, and by whom?		
C NYC				
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C NYC				
			С	NYC

Question 2 – Stockpiles and reclaim tunnels

Work Health and Safety (Mines and Petroleum Sites) Regulation		
87 Ventilation		
(1) This clause applies to the following items of plant—		
(a) any component of the ventilation system of an underground coal mine,		
(b) used at an underground coal mine or	in a	
reclaim tunnel at a coal mine.		
(2) The regulator may, by notice published in the Gazette, identify an item of plant to which	this	
clause applies and specify the testing and certification process for determining whether the plant is	item	of
(3) The mine operator of a coal mine must ensure that an item of plant specified in a notice	und	er
this clause is not used at the mine unless it has been tested and certified in accordance with notice.	n the	
a. According to Clause 87 (1) (b) what items of plant are referred to, and what must the	ey be	e?
	С	NYC
b. Very few Australian Standards are specifically referred to in the Work Health and S (Mines and Petroleum Sites) Regulation. Schedule 2 (2) (4) (c) refers to which Aust Standard?	•	
	С	NYC
		<u>'</u>

MDG28 Sa	fety requirements for coal stockpiles and reclaim tunnels		
C	Section 3.1.4 refers to dozer engulfment. List six (6) risks of harm to the dozer operation.	ator i	n
	relation to the stockpile draw down points.	ator i	
		С	NYC
d.	Section 3.2.1 identifies recommended minimum controls for dozers working on coal		
	stockpiles. List six (6) mitigative controls required		
_			
		С	NVC
			NYC

Question 3 - WHS (MPS) Regulations - Winders

Work Health and Safety (Mines and Petroleum Sites) Regulation

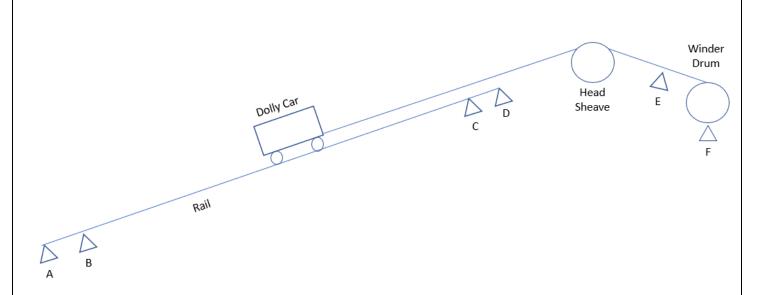
5 Meaning of principal hazard (cl 612 model WHS Regs)

In this Regulation, a principal hazard is any activity, process, procedure, plant, structure, substance, situation or other circumstance relating to the carrying out of—

- (a) mining operations that have a reasonable potential to result in multiple deaths in a single incident or a series of recurring incidents in relation to any of the following—
 - (i) ground or strata failure,
 - (ii) inundation or inrush of any substance,
 - (iii) mine shafts and winding systems,...

Work Health and Safety (Mines and Petroleum Sites) Regulation Clause 5 (a) (iii) identifies winders as a principal hazard that may result in multiple deaths from a single incident. Mine shafts and winding systems NSW Code of Practice was released by the Resources Regulator in 2019 to assist mines identify potential hazards and develop controls to safely manage their winders.

a.	Identify six (6) hazards associated with winders that may result in one or more fatal	ities	
		С	NYC



- b. Identify the following limit switch / monitoring device denoted on the attached drawing
 - A -
 - B -
 - C -
 - D-
 - E -
 - F-

C NYC

WHS(MPS) Schedule 1

3 Mine shafts and winding systems

The following matters must be considered in developing the control measures to manage the risks associated with mine shafts and winding systems—

- (a) the potential for instability and loss of integrity of the shaft,
- (b) the potential for fires in underground operations, the shaft or winder areas,
- (c) the potential for any unintended or uncontrolled movement of conveyances within the shaft,
- (d) the potential for a conveyance to fall down the shaft,
- (e) the potential for failure of, or damage to, equipment and control measures, including the following—
 - (i) control measures that are intended to prevent any shaft conveyance from overwind, excessive acceleration or deceleration, unsafe or excessive speeds or uncontrolled movement,

(ii) control measures that are intended to detect the presence of slack rope, drum slip		
conditions or unsafe tail rope conditions,		
(iii) braking systems and systems performing an equivalent function that are intended to	ensu	ıre
that the winder remains under control,		
(iv) warning systems that are intended to alert persons at the mine to any emergency in winding system,	а	
(v) communication systems, (f) the notantial for injury to a narrow from		
(f) the potential for injury to a person from—		
(i) material being carried in a conveyance with the person, or		
(ii) material falling from a conveyance, or		
(iii) the person falling from a conveyance, or		
(iv) a part of the person extending out of the conveyance,		
(g) provision for the emergency exit of persons from a conveyance.		
 c. Clause (3) (e) (ii) requires control measures to detect the presence of slack rope. Li (3) ways slack rope can be generated 	st thr	ree
	,	
	С	NYC

should be considered to ensure the winder cage remains under control		
		_
	С	

	Question 4 -	WHS	Regulation	- C	onfined	Space
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You have accepted the position as the Mechanical Engineering Manager at an existing mine and have been requested to review the Confined Spaces at the mine, and the conditions for working in them.

mem.				
	a.	As detailed in Clause 5 Definitions what are the requirements for a confined space		
			С	NYC
	b.	What technical references specifically addressing the management of confined spa would you refer to in your review. Identify two (2).	ces	
			С	NYC

C.	Part 4.3 Clauses 67 to 76 identify control requirements in relation to the management	nt of	
	confined spaces. Identify three (3).		
		С	NYC
d.	With respect to entry into confined spaces for each of the items below detail both the meaning of the acronym and your understanding of the term.	е	
	i. LEL ii. UEL		
	iii. TWA iv. STEL		
		С	NYC

Question 5 – WHS Act – Missing words

a. Fill in the missing words for Section 3 Object

(1) Th	ne main object of this Act is to provide for a balanced and nationally consistent framew	vork to
secure	e the health and safety of workers and workplaces by—	
(a)	protecting workers and other persons against harm to their health, safety and welfare	Э
	through the	
	of risks arising from work or from specified types of substances or plant, and	
(b)	providing forworkplace represe	ntation,
	consultation, co-operation and issue resolution in relation to work health and safety,	and
(c)	encouraging unions and employer organisations to take a constructive role in promot	ting
	improvements in work health and safety practices, and assisting persons conducting	1
	businesses or undertakings and workers to achieve a	
	working environment, and	
(d)	promoting the provision of advice, information,	
	in relation to work health and safety, an	ıd
(e)	securing compliance with this Act through effective and appropriate compliance and	
		_, and
(f)	ensuring appropriate	
	of actions taken by persons exercising powers and performing functions under this A	Act, and
(g)	providing a framework for	
	and progressively higher standards of work health and safety, and	
(h)	maintaining and strengthening the national harmonisation of laws relating to work he	alth
	and safety and to facilitate a consistent national approach to work health and safety	in this
	jurisdiction.	
		T
		C NYC

b. F	-ill in the missing words for Section 19 Primary duty of care
(1) A p	erson conducting a business or undertaking must ensure, so far as is reasonably
prac	ticable, the health and safety of—
(a)	workers engaged, or caused to be engaged by the person, and
(b)	workers whose activities in carrying out work are influenced or directed by the person,
,	while the workers are at work in the business or undertaking.
(2) A p	erson conducting a business or undertaking must ensure, so far as is reasonably
prac	ticable, that the health and safety of other persons is not put at risk from work carried out
as p	art of the conduct of the business or undertaking.
(3) Wit	hout limiting subsections (1) and (2), a person conducting a business or undertaking must
ensu	ure, so far as is reasonably practicable—
(a)	the provision and maintenance of a
	without risks to health and safety, and
(b)	the provision and maintenance of safe,
	and
(c)	the provision and maintenance of safe,
	and
(d)	the safe use, handling, and storage of
	, and
(e)	the provision of adequate for the
	welfare at work of workers in carrying out work for the business or undertaking, including
	ensuring access to those, and
(f)	the provision of any
	that is necessary to protect all persons
	from risks to their health and safety arising from work carried out as part of the conduct
	of the business or undertaking, and

c. Fill While at v (a) take _ and s (b) take _ the he (c) completed	of workers arising from the conduct of the business or undertaking. Il in the missing words for Section 28 Duties of workers work, a worker must— for his or her own safety, and that his do not adversely the alth and safety of ply, so far as the worker is reasonably able, with any	is or he y affec , and
c. Fill While at v (a) take _ and s (b) take _ the he (c) completed	Il in the missing words for Section 28 Duties of workers work, a worker must— for his or her own safety, and that his do not adversely nealth and safety of bly, so far as the worker is reasonably able, with any	i health is or he y affec , and
c. Fill While at v (a) take _ and s (b) take _ the he (c) completed	Il in the missing words for Section 28 Duties of workers work, a worker must— for his or her own safety, and that his do not adversely nealth and safety of bly, so far as the worker is reasonably able, with any	i health is or he y affec , and
(a) take _ and s (b) take _ the he (c) complete under	for his or her own safety, andthat hisdo not adversely nealth and safety of bly, so far as the worker is reasonably able, with any	is or he y affec , and
and s (b) take _ the he (c) comple under	safety, and that his do not adversely nealth and safety of bly, so far as the worker is reasonably able, with any	is or he y affec , and
the house under	that hisdo not adversely nealth and safety of bly, so far as the worker is reasonably able, with any	y affec , and
the holes the holes complete the	do not adversely nealth and safety of bly, so far as the worker is reasonably able, with any	y affec , and
the hole (c) complete under	nealth and safety of	, and
(c) complete	oly, so far as the worker is reasonably able, with any	
unde		
unde		
	that is given by the person conducting the busin	ness o
(D	ertaking to allow the person to comply with this Act, and	
(d) co-op	perate with any	
	of the person conducting the busing	iness c
unde	ertaking relating to health or safety at the workplace that has been notified to work	cers.
		С
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Question 6 – Safety Bulletin SB22-04 Hand injuries



NSW Resources Regulator

SAFETY BULLETIN

DATE: MARCH 2022

Hand injuries (including fingers and thumbs)

This safety bulletin provides safety advice for the NSW mining industry.

Issue

The NSW Resources Regulator has noted an increase in the number of reported injuries involving hands within the mining sector. One hundred and forty-one hand injuries were reported to Regulator during 2021. Hands, fingers and thumbs being caught, crushed, jammed and/or pinched was the most common cause of injury. While some injuries such as minor lacerations were treated with sutures or glue, some more serious hand injuries resulted in fractures, tendon or nerve damage. Some workers suffered injuries requiring surgery and ongoing specialist care. Nine workers had one or more fingers amputated over the past 12 months.

Mining and hand injuries

Operational and maintenance tasks can be highly complex and intricate tasks that require workers to place their hands within or near equipment that has sharp edges, pinch points or can move. In addition, mine workers undertaking these tasks also needs to manage:

- working near moving and rotating equipment
- load shifting during parts removal and change out
- underground environments with limited light
- undertaking tasks in tight awkward positions with restricted visual capacity.

Workers were wearing gloves in most incidents, and on some occasions workers were not aware they had suffered an injury until they had removed their gloves.

	In relation to hand injuries identify four (4) specific notification requirements under V Health and Safety (Mines and Petroleum Sites) Regulations Clause 178.	/Vork	
		С	NY
		1	
		С	NY
		С	N
C.	With consideration to the hierarchy of controls, and the obligations of both Mine Op and workers, describe seven (7) actions you would implement to minimise the potential hand injuries.	erato	ors
C.	and workers, describe seven (7) actions you would implement to minimise the potential	erato	ors
C.	and workers, describe seven (7) actions you would implement to minimise the potential	erato	ors
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C.	and workers, describe seven (7) actions you would implement to minimise the potential	erato	ors

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Question 7 – WHS Act - Consultation		
Work Health and Safety Act Part 5 Division 2 Consultation with workers places duties on the C (PCBU) of a coal mine to engage in consultation, and includes the following sections: 46. Duty to consult with other duty holders 47. Duty to consult with workers 48. Nature of consultation 49. When consultation is required	pera	tor
a. What requirements are placed on the PCBU to consult with workers?		
	С	NYC
b. What requirements are placed on the nature of consultation?		
	С	NYC
	I	

c. When is consultation required?	
	C NYC

Question 8 – WHS (MPS) Regulation – Notifiable incidents					
The Work Health and Safety (Mines and Petroleum Sites) Legislation identifies conditions a timeframes for when notification to the Regulator is required.	nd				
a. In the WHS (Mines and Petroleum) Act 2013 Part 3 Incident Notification Section are the three (3) categories of "notifiable incidents"?	14, wha	at			
	С	NYC			
b. WHS (Mines and Petroleum) Regulation 2014 Clause 179 Dangerous Incidents twenty four (24) requirements to notify, name twelve (12) of the categories of "Dincidents"?					

		С	NY
C.	What is the primary difference between the high potential incident events identified Clause 128 (5) (a), which refers to events in Clause 179 (a), and the dangerous incidentified in Clause 179		S
		С	NY
d.	Apart from the incident type events described in Clause 179 (a) there are twenty on additional incidents that have to be reported in Clause 128 (5). List three (3).		
d.			NY 1)

Question 9 – Legislative framework		
Demonstrate your understanding of the relationship between the WHS Act, WHS Regulations of Practice, and Australian Standards by describing what they are, and outlining the key difference between these sources of information		
a. An Act of Parliament – Work Health and Safety Act		
	С	NYC
b. Work Health and Safety Regulation		
	С	NYC
	1	

c. Codes of Practice				
			С	N'
d. Avertualism Oten dend				IN
d. Australian Standard				
			C	N'

Question 10 - Diesel exhaust emissions

- 53 Exhaust emissions and fuel standards
- (1) The mine operator of an underground mine must ensure that—
 - (a) exhaust emissions from diesel engines located underground are regularly sampled and analysed, and
 - (b) the results of that sampling and analysis are compared with the baseline exhaust emissions for the particular diesel engine when the engine was new (or as new), and
 - (c) the engine is regularly maintained so that emissions from the engine are as low as is reasonably practicable, having regard to those baseline exhaust emissions.
- (2) The mine operator of an underground mine must ensure that any fuel used at the mine—
 - (a) is supplied in accordance with the Fuel Quality Standards Act 2000 of the Commonwealth and the Fuel Standard (Automotive Diesel) Determination 2001 made under that Act, or
 - (b) is supplied in accordance with a fuel standard that has been varied by an approval under that Act by the Minister administering that Act.
- (3) The mine operator of an underground mine must ensure that any fuel referred to in subclause (2)(b) or fuel additives used at the mine do not increase the health and safety risks to workers at the mine—
- (4) Comparison load testing on underground diesel engines at various load points must be used to determine whether a fuel or fuel additive increases the health and safety risks to workers at the mine under subclause (3).

Diesel exhaust was identified as a carcinogen to humans in June 2012 by the International Agency for Research on Cancer.

ć	a.	Describe four (4) types of gas tests, and the frequency that they are completed, you implemented to meet the requirements of Clause 53 (1)	have	9
			С	NYC

	Choose two test.	ŭ				•		. •	
								С	N)
Samo	ling and anal	lycic of oxba	ust omission	0					
	ling and anal operator of a				e that exh	aust emis	sions fron	n diesel	
	cated underg								ling
	under Part 9.	,		, <u> </u>			_		3
C.	According to	Clause 75	at what frequ	iency is test	ing require	ed?			

d. What are the raw and diluted diesel emission gas limits for diesel exhaust specified in MDG 29 Guideline for the management of diesel engine pollutants in underground environments? Complete the following table:

Contaminant	Raw Exhaust Limits	Diluted (General Body) Limits
Carbon Monoxide		
Nitrous Oxide		
Nitrogen Dioxide		
DPM Elemental Carbon		

С	NYC

END OF QUESTIONS

BLANK PAPER TO WRITE ANSWERS THAT YOU COULD FIT INTO THE	
PROVIDED – INDICATE QUESTION NUMBER AT START OF ANSW	EK
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