PROMV15

Design and Maintain Mine Ventilation Systems

Overview

Achievement of this standard demonstrates your competence in the context of your occupation and work environment, in the following areas:

1. The design of mine ventilation systems
2. Modelling of mine ventilation
3. Production of mine ventilation procedures
4. Monitoring review and amendment of systems and procedures

Performance criteria

You must be able to:

P1 Identify and confirm the objective (requirements for ventilation)

P2 Obtain relevant, current and applicable sources of information.

P3 Enlist advice/support of other management/specialists/regulatory bodies as appropriate.

P4 Design ventilation system/s to meet the objectives.

P5 Ascertain that the proposed system/s are compatible with the manager's scheme for the operation of the mine.

P6 Identify the specification/s for plant and equipment required to meet the objective.

P 7 Develop models to test the design.

P8 Evaluate results and amend design/model as appropriate

P9 Ascertain direct and indirect risks associated with proposed method of ventilation.

P10 Develop operational procedures for the system/s (in normal situations and in emergency situations).

P 11 Confirm all approvals have been granted prior to work commencing.

P12 Monitor and evaluate performance of ventilation system/s.

P13 Amend designs, models, systems and procedures.

Knowledge and understanding

You need to know and understand:

Legislative

K1 the legislative framework (Acts, Regulations, Approved Codes of Practice, Guidance)

K2 the legislative definition of a mine, and the classification of mines

K3 the management and administration control structure and its purpose (including accountability and ultimate authority)

K4 the statutory duties, role and responsibilities of mine owner, management and supervision

K5 personal statutory duties and responsibilities, and the limits of that responsibility

K6 personal area/district of responsibility

K7 responsibilities of mine employees

K8 legislation in relation to mine ventilation

K9 statutory requirements for a safe system of work

K10 definitions of hazard, risk, accident, danger, accident rate, frequency and severity, environmental aspect, environmental incident

K11 duties, powers and responsibilities in the event of an emergency situation

K12 statutory requirements and organisational procedures for the installation, commissioning, inspection, examination, testing and maintenance of ventilation systems, plant and equipment

K13 statutory and organisational requirements for personal protective equipment (routine and emergency)

K14 recording procedures in relation to statutory requirements

K15 statutory requirements and organisational procedures for the operation of the mine

K16 statutory requirements and operational procedures for ventilation, control of dust and mine gases.

Condition of the mine

K17 the major hazards and risks associated with mining in general and the specific mine/ mining operations

K18 the scope and limitations of the mine, its design and layout, including current areas of use, abandoned areas and future developments as appropriate.

K19 geological features that may affect the safe operation of the mine

K20 geological and/or physical indications of potentially deteriorating/unsafe conditions

K21 acceptable environmental conditions and functioning of ventilation system/s

K22 hazardous gasses (noxious/flammable); range of gasses, how these arise in the mine, where these might accumulate, inspection method, acceptable levels, affects if not addressed

K23 hazardous dusts (inhalable/flammable): range of dusts, how these arise in the mine, where these might accumulate, inspection method, acceptable levels, affects if not addressed

K24 actions to be taken in the event of identifying an aspect of the condition of the mine that may lead to a hazardous situation or unsafe working

K25 the type and purpose of environmental monitoring activities

K26 the effect that activities in one area can have on the activity, health and safety of others

K27 how emergency situations can arise in your area of responsibility

K28 responsibilities of self and others and procedures to follow in event of an emergency situation

K29 operational policies and procedures for the maintenance of a safe mine environment e.g. dust suppression, degassing

K30 the terms; quantity, flow, pressure, resistance, volume, and cross-sectional area of airways

K31 regulatory requirements and organisational procedures for reporting and recording shortfalls in the quality of the mine environment

Working with others

K32 procedures for ensuring activities are carried out by competent personnel

K33 arrangements for first aid, health and welfare of personnel

K34 your own responsibilities and the limits of those responsibilities

K35 the allocation of tasks and duties

K36 the benefits of team working and methods to achieve this

K37 organisational reporting and recording procedures

K38 the importance of effective communications

K39 communications systems/procedures in area of responsibility

K40 the dangers of working in isolation

K41 organisational requirements for recording/monitoring personnel in your area of responsibility

Mine ventilation

K42 types, features, advantages and limitations of ventilation systems/equipment

K43 the mine geological/environmental factors that may affect the choice and performance of operational ventilation systems

K44 cost / benefit analysis of implementing method of ventilating the mine

K45 sources of information in relation to methods of ventilating the mine

K46 mine plans/maps/designs/technical information

K47 how to develop and draft a ventilation operational plan

K48 procedures for obtaining approvals to proceed with ventilation operational plans

K49 how to check that the plan for ventilation is compatible with mine design and operational constraints

K50 business planning cycle and budget preparation

K51 relevant approved codes of practice and guidance for working safely

K52 industrial standards/specifications in relation to mining ventilation plant and equipment

K53 the principal activities involved in mining operations and mineral winning

K54 the main functions within the operational cycle

K55 mine logistics procedures and systems for the delivery of supplies

K56 organisational procedures in the event of problems/repairs occurring that are not immediately rectifiable

K57 The gas laws.

K58 The laws of thermodynamics(basic knowledge only)

K59 Geological features that could affect mine ventilation.

K60 The range of mine ventilation systems and equipment.

K 61 How mine ventilation systems interact.

K62 The effect of abandoned workings on mine ventilation

K63 Techniques for measuring and calculating to establish requirements of auxiliary ventilation systems

K64 The procedures to be followed should ventilation systems and/or equipment not be working as required.

K65 Methods of presenting draft ventilation designs

K66 When exemptions to ventilation regulatory requirements could be permitted.

K67 Scope and requirements of current exemptions

K68 Organisational procedures for approving, implementing and/or amending ventilation arrangements.

K69 Ventilation modelling techniques

K70 The scope and limitations of ventilation measuring/testing equipment.

K71 The incidence and effects of sensor cross sensitivity.

K72 Sources of information on mine ventilation and ventilation systems/equipment.

K73 The requirements for ventilation procedures (normal and emergency situations)

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