A Suggested Management System for Electrical Explosion Protected Apparatus (EPA) used on Coal Mines

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A Suggested Management System for Electrical EPA used on Coal Mines

• Although the generic term 'electrical explosion protected apparatus' is used, most common electrical EPA found on coal mines is ‘Flameproof’ (Ex ‘d’) and ‘Intrinsically safe’ (Ex ‘i’)
• A suggested system for the control and management of electrical EPA installed on coal mines
• Minimum ingredients for the compliance with the legal requirements and reasonable safe working practices when electrical EPA is used in a coal mine
• The suggested system however does not cover diesel EPA but the recommendations made can easily be applied to all types of EPA

TYPICAL ELECTRICAL EPA ON A COAL MINE

• The Management System for electrical EPA is to cater for the following apparatus but is not limited to:
  • Intrinsically Safe (IS) equipment, Ex ia and Ex ib (e.g. Environmental Monitoring, Conveyor Pullkey Systems, Telemetry)
  • Trailing cables, plugs and sockets
  • Switchgear, mobile and stationary, portable
  • Transformers
  • Luminaires
  • Motors
Components of the EPA Management System

Area Classification

Code of Practice

Procedures

Training

Appointments

EPA Register

Equipment Control and Records

Application of Mine Management System

Components of the EPA Management System

Area Classification
**Area Classification**

- Mine Manager should classify all areas in the mine that he feels are hazardous.
- Should be recorded in the form of drawings (mine plans) and how this was done and the decisions taken
- Updates of the classification should be done regularly

**Components of the EPA Management System**

- Code of Practice
What is a Code of Practice (COP)?

- A ruling document to provide for legal and internal requirements
- Generic for the entire operation
- Defines the rules
- Reviewed and updated continuously
- Compliance with the Mine Health and Safety Act and Regulations
- Incorporate directives from the DMR
- Reflects best practice

The COP shall typically include:

For the Selection and Purchase of electrical EPA:

- What companies are approved to supply EPA and specifically what type of EPA
- The selection and purchasing procedures to be followed
- The necessary approvals and signatories
- The standards and specifications the equipment is to be made to
- The inspection of equipment prior to delivery and upon receipt
- The required documentation such as Approved Test Laboratory test reports and approval certificates
The COP shall typically include:

For the **Repair** of electrical EPA:
- What companies are approved to repair EPA and specifically what type of EPA
- The selection and purchasing procedures to be followed
- The necessary approvals and signatories
- The standards and specifications the equipment is to be repaired to
- The inspection of equipment prior to delivery and upon receipt
- The required documentation such as test reports and flameproof inspection reports

The COP shall typically include:

For the **Modification** of electrical EPA:
- What companies are approved to modify EPA and specifically what type of EPA
- The selection and purchasing procedures to be followed
- The necessary approvals and signatories
- The standards and specifications the equipment is to be modified to
- The inspection of equipment prior to delivery and upon receipt
- The modification should be re-certified
- The required documentation such as Approved Test Laboratory test reports and approval certificates
The COP shall typically include:

For the Inspection of electrical EPA:
- Who is responsible to carry out inspections on EPA and who needs to be appointed to carry out this work
- What are the necessary qualifications, training and competencies of the appointed persons, such as Flameproof Certificate and Gas Testing Certificate
- To what standards and procedures are the appointed persons required to adhere to
- What type of inspection: in service and/or prior delivery, upon received from a manufacture or repairer, by either a Visual, Close or Detailed inspection
- What frequency of inspection for equipment in service
- Frequency and type of inspection to be determined by Risk Assessment, physical conditions, environment, etc

The COP shall typically include:

The Maintenance of electrical EPA:
- Who is responsible to carry out maintenance on EPA and who needs to be appointed to carry out this work
- What are the necessary qualifications, training and competencies of the appointed persons, such as Flameproof Certificate and Gas Testing Certificate
- To what standards and procedures are the appointed persons required to adhere to
- What frequency of maintenance on equipment in service
- What type of maintenance is required is to be determined by the results of the visual, close or detailed inspections done
The COP shall typically include:

Record keeping:
• Who is responsible for the keeping of records
• Who needs to be appointed to carry out this work
• What are the necessary qualifications, training and competencies of the appointed persons
• To what standards and procedures are the appointed persons required to adhere to
• What type of record keeping is required
• Where are the records to be kept, filed and stored

The COP shall typically include:

STANDARDS:
• Manufacture, modification and repair standards for all EPA must comply with the relative SANS standards and have certification from an Testing Laboratory approved by the DMR
• The Mine is to take cognisance of the available specifications on various EPA, and make use of them when enquiries for tender are issued
• Mine to have a list of approved and contracted companies for the supply of EPA
Components of the EPA Management System

**PROCEDURES**

- Step-by-step descriptions of tasks or actions to ensure safe and correct actions and performance
- The procedures shall comply with the Code of Practice
- They indicate the person responsible
- Training requirements are specified, such as Flameproof and Gas testing Certificates
- All necessary safety precautions are stated, such as PPE
- Tools, equipment and materials are listed
Components of the EPA Management System

Training

TRAINING

The Mine to ensure that the competency of persons required to work with EPA is established and the applicable training is put in place such as:

- Theoretical and practical training on equipment and systems in use on the Mine
- Familiarise personnel with management processes, Codes of Practice, procedures and working documents
- Provide knowledge of safe methods, risks and precautions for tasks or actions
- Train personnel on the maintenance, operating, testing and inspection tasks
- Test trained personnel to ensure that they achieve the required level of knowledge and therefore can be subsequently deemed competent and be appointed
## Components of the EPA Management System

### Appointments

- Once the Codes of Practice and Procedures have been compiled, the necessary training taken place and the candidate deemed competent, the appointment of such a person(s) can take place to carry out the duties with regards to the inspection, maintenance and repair of EPA on the Mine.

- Appointments to include detail such as:
  - Area of responsibility or equipment responsible for
  - Frequency of inspection, testing or maintenance
  - To what Procedures the necessary work and appointment is to be carried out
  - Date of appointment and expiry date (if any), or date of re-testing of candidate

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Components of the EPA Management System

EXPLOSION PROTECTED APPARATUS REGISTER

- A register should be kept of all electrical EPA in use
- The equipment should be listed and grouped appropriately with the following nameplate information:
  - Original Manufacturer
  - Repairer (if applicable)
  - Serial number
  - Date of manufacture/repair
  - GME or Inspection Authority number
  - Type of explosion protection classification, i.e. Ex ‘d’ IIB T3, Ex ‘i’
  - Further information such as locality of each piece of equipment and a copy of the equipment’s Inspection Authority (IA) test report and Certificate of Approval should also be filed in this register
Components of the EPA Management System

Equipment Control and Records

EQUIPMENT CONTROL & RECORDS

- To ensure that tasks, procedures and processes are correctly carried out, operating or working documents should be drawn up, distributed and filed.
- They support Codes of Practice and Procedures and include:
  - Approval Certificates and Test reports
  - Job cards that define the job and the responsibility for the job
  - Check lists and inspection lists
  - Specifications that define the Mine's requirements to outside suppliers. They shall include standards to comply with (e.g., SANS, IEC, etc), functional, operational and safety requirements. They are for new equipment, modifications and repairs, define what equipment is acceptable
  - Permits authorise competent persons to carry out defined tasks in terms of a Permit-to-Work system
  - Parts lists for efficient maintenance
  - Drawings; schematic diagrams, reticulation drawings
Components of the EPA Management System

Application of Mine Management System

APPLICATION OF THE MANAGEMENT SYSTEM

• The application of the Mine Management System for explosion protected electrical apparatus can be checked by the following means:
  • A self-audit
  • An external-audit, with the help of external auditors and/or other recognised competent experts in this field from other mines or elsewhere
  • The objective is to check compliance with recommended guidelines and best practices by looking at paper work, systems and physical conditions
THANK YOU – Any Questions?