Queensland Government

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Mine Name	Mine ID	Operator	Activity Type	Region	Activity Date
Grosvenor Coal Mine	M102976	Anglo Coal (Grosvenor Management) Pty Ltd	Inspection	Central	08/03/2016

Vision: Our Industries Free of Safety and Health Incidents

Mine Record Entry

This report forms part of the Mine Record under s68 of the Coal Mining Safety and Health Act 1999. It must be placed in the Mine Record and displayed on Safety Notice Boards.

Note that inspection or audit activities conducted by the Mines Inspectorate are based upon sample techniques. It remains the primary responsibility of Mine Personnel to identify hazards, and risks associated with Operations and ensure those risks are at an acceptable level.

Site Safety & Health Reps Consulted: Jayson Sharpe

Today Mines Inspector Paul Sullivan conducted an inspection of Grosvenor Coal Mine. I was met by Electrical Engineering Manager (EEM) Mr Lyle Bridgeman. Prior to undertaking an inspection of the underground, a review of previous MREs and electrical HPI incidents was conducted and a general discussion of various topics also took place.

Mr Bridgeman provided an overview of the mine's production performance, mining sequences and electrical equipment and infrastructure currently in use.

We discussed the mine's electrical reporting structure with the underpinning consideration being how electrical compliance issues are brought to the attention of the EEM. The explanation from Mr Bridgeman indicates that this aspect of reporting seems to be adequate however it appears to be because of the diligence of the EEM and electrical co-ordinators rather than a robust system. I commented that a mine's reporting structure should ensure that tradesmen's reports are read and countersigned by personnel who are in a position to identify, manage and escalate issues / concerns that are raised by the tradesmen.

Electrical Reporting Structure “not robust”.

No shift sign off? Against the Act and Regulations?

Also another Contractor Management Failure.

Bottom half of page Review of previous MRE (25/8/2015) Obviously still not addressed.

A review of Inspector Peter Herbert's MRE (25/08/2015) was then conducted with the salient points being:

o There is a Development panel cable management check-sheet that is signed off by electrical tradesmen weekly and monitored by electrical supervisors. I noted that mines which have good trailing cable management standards normally incorporate a shiftly sign-off by both the ERZ Controller and the panel electrician that the cable reticulation and handling practices are compliant to the cable management procedure. I have recommended that the mine:

1. Considers the management practice of ERZ Controllers signing-off on the panels cable management.

- Electrical drawings and schematics for equipment and infrastructure are still being received by the mine with as-built mark ups being ongoing.

- Only electrical personnel are currently undertaking the connection and disconnection of 1 100 volt restrained plugs and receptacles.

- The Control Room is fully operational.

We then reviewed the following safety alerts:

- Safety bulletin issued by Sandvik (SBI 505) - This safety bulletin is applicable to all Sandvik bolter miners fitted with Pempek system LOWD HMI stations and relates to concerns regarding possible interference from magnetic equipment. It was discussed in general terms.
- Safety Alert SAI 5-03 (NSW) "Electrician Injured after making Contact with Live High Voltage Conductor" - Mr Bridgeman was aware of this alert and has raised it with the crews.

- Safety Alert 315 "Damaged Cable Results in Feeder Breaker Fire" - This highlighted intrinsically safe (IS) circuits and the potential for resistive type series faults on these installations to possibly go undetected. It is imperative that these IS circuits and associated cables are adequately protected from external damage.

- Safety Alert (Anglo-American) " Posi-box Design Change / Defect" - Mr Bridgeman has seen this alert and an audit of the mine has indicated that there are none onsite. A toolbox talk with tradesmen has also been undertaken. I remarked that more than one mine has found this new style Posi-box in their warehouse system or in service.

- Mr Bridgeman had not seen the re-issued safety alert SA10-02 (NSW) "Electric Shocks from Power Tools" and I remarked that it should be part of a toolbox talk to all tradesmen regarding the correct handling of this type of equipment. I have stated that I will forward this safety alert to him.

- Austdac Vehiclegas-NGVG3-1: There is an issue with the PCB insulation coating that did not comply to the Certificate of Conformity for a certain batch. Mr Bridgeman is checking his site to ensure that this is not an issue at the mine but does not believe they have this type of equipment.

Prior to undertaking an underground inspection, I asked Control Room Operator (CRO) Mr Neville Mell to indicate what gas monitors were in alarm and how they were being managed. He indicated that there were no Real Time (RT) or Tube Bundle monitors in alarm. SIMTARS

were onsite for further commissioning and maintenance of the Safegas system and Tube Bundle hut.

I asked Mr Mell to describe the process that is followed by the CRO when the zone gas monitoring boundaries were being calibrated and what controls were in place to prevent the station being left in bypass. He described the process that keeps the CRO informed of the gas monitoring station being placed into bypass underground. He was initially unsure of the indication that would appear on the SCADA system but later confirmed that the indication status does change if a boundary monitor is placed in bypass. The time-out / alarm function is activated if the bypass is still active after 30 minutes. He also showed me the Gas Alarm Register where this has been recorded and signed off by the Underground Mine Manager (UMM) Ventilation Officer (VO) and the oncoming CRO. The system appears adequate and is similar to what is done at other mines. Mr Mell [i] s description was equivalent to the one described by Mr Bridgeman earlier and there are no issues apparent.

CRO

Not as familiar as stated about methane detector in bypass. 30-minute alarm for detector in bypass

I then requested Mr Mell to explain the process for managing Uncertified Portable Electrical Equipment (UPEE), how it is tracked and that it is returned to the surface and accounted for. I noted that a Fibre UFL taken underground on the 5th of March 2016 did not have a CRO signature against it. A camera taken underground on the 19th of December 2015 did not have acknowledgement that it was removed from the underground workings or signed for as per expected process. These was not the only pieces of UPEE that were not managed as per the procedure. Though has been no incidents identified to the Inspectorate, these failures indicate the system is by no means robust. In the debrief I recommended that the mine:

1. Review and improve the process of equipment being signed in and out of the mine by both the person taking it underground and by the CRO.

Uncertified Portable Electrical Equipment system and paperwork not filled out or signed off correctly

Recommendation (Little or No Legal Standing).

Maintenance Superintendent Mr Brad Stansfield described the current boundary zone gas monitoring arrangement and the plan to include NERZ / NERZ interface monitoring. Additional CH4 monitors will also be installed at the tripper drive locations.

Accompanied by Mr Bridgeman, Mr Stansfield and Development Electrical Co-ordinator Mr Greg Seppanen an underground inspection was then undertaken and the following points noted:

The LED strip lighting which illuminates through the portal entry and into the main headings is an industry leading practice and will be recommended to other mines.

<u>7c/t Pit Bottom Substation</u>

The housekeeping was to a reasonable standard. There was good cable identification and the reticulation of high voltage cables was adequate. Mr Stansfield and I discussed the use of power factor correction systems and he explained that the current modelling for the mine is being reviewed. I commented about a plasticised warning sign which indicated that an isolation of an SBLOI panel may not isolate the 1 10v control into that panel. I was informed

that this had been identified in the commissioning and that there was a plan in place to rectify the 110 volt control circuits within a month or so hence why the warning sign is not of a more robust construction. Critical electrical enclosures and panels had electrical locks securing them.

Pit Bottom substation (1st Installed). Problem since Commissioning about possible not isolating of 110 v control in panel. Temporary laminated information sign. Again something planned for Grosvenor (1 month).

Drivehead CV002

A contract electrical team were conducting a high voltage isolation and I questioned Mr Josh Lorraway and Mr Dean Riley, who were listed on the switching sheet as the switching officers, to explain how the switching task was performed focusing on the identification of the circuit to be isolated and "tested for dead". From their explanation and the completion of the switching and permit sheets it appeared that the task was well done and there was a clear understanding of the process. An opportunity for improvement is to consider the use of "carbon copy" high voltage documentation. At my request Mr Seppanen and Mr Bridgeman described the high voltage authorisation process and it appears to be consistent with industry requirements. I remarked that high voltage switching will be a focus during my next inspection.

Carbon copy high voltage documentation suggested only

TGIOI Panel

At the tag board there was a CH4 gas monitor and I remarked that there is an opportunity for improvement with the gas monitoring to identify the alarming and tripping functions of the station as well as response protocols at the site of the monitors. I explained that there is an appendix in the final draft of AS / NZS 2290.3 "Electrical equipment for coal mines — Maintenance and overhaul / Part 3: Maintenance of gas detecting and monitoring equipment" that highlights expected mounting and signage requirements. As the monitor was fixed to the roof and quite high, I commented that this may be introducing a hazard for tradesmen to access the monitor for maintenance and asked Mr Bridgeman to confirm how this was done.

Opportunity for Improvement or Non-compliance to AS/NZS 2290.3 Electrical equipment for coal mines- Maintenance and overhaul/Part 3 Maintenance of gas detecting and monitoring equipment

Substation TXL15 was in good order with reasonable housekeeping and there were no issues apparent.

In the cribroom I was shown the crew communication "ACOM" Hazard Board which lists hazards and controls that are identified for the panel. This is a good focus on crews maintaining safety and health communication between them and it was pleasing to note that the board was up to date.

The Electrical Report book was filled out as per expectations. There were no issues and the book is set out quite well. Mr Stansfield described the process of tradesmen being issued their work orders as packs and described how the type of work orders that are issued as well as how defects noted by tradesmen are captured in the scheduled maintenance system. If followed, the process as explained is quite thorough.

Electrician work orders. Inspector only asks does not check system or documents by entry. Is this acceptable post Grasstree Paul McGuire fatality.

I met electrician Mr Mark Sleight and Site Safety & Health Representative (SSHR) Mr Jayson Sharpe and at my request, Mr Sleight explained the process he would follow to gain access into the line side of the DCB. He did this in a competent manner highlighting the requirement to "test for dead" with a voltage proximity detector which is normally carried on his person. We checked the electrical protection settings for the shuttle car HUK02 and they were the same as the protection settings check-sheet. I later asked Mr Bridgeman to confirm the setting on the earth leakage time was set to disconnect power as soon as practicable and to forward this information through to me.

The Distribution Control Box (DCB) DBK-OI was in reasonable order and Mr Sleight explained the various aspects of this type of DCB.

At the continuous miner I asked Mr Sleight to explain the process he would follow to calibrate the sensor heads on the machine and what would be the alarming / tripping levels and functionality. He did this in a competent manner and the values and functions he described appear compliant to the CMSH Regulations. From his description the bolting rigs also cease to operate when the cutter heads trip.

The continuous miner has indication mode area lighting which colour changes if the tail of the miner has the ability to move. This is considered an industry leading practice which supports the mines "Go" / "No Go" zone awareness procedure. With this we discussed vehicular / people interaction and I remarked that there are some mines now installing:

1) Thermography cameras which view the off-drivers side of the shuttle car with screens in the operators cab for the detection of personnel.

2) Colour changing area lighting such as green for "Go" (safe to approach) and red for the opposite to support the mines "Go / No Go" procedures on shuttle cars and breaker feeders as well as continuous miners.

The mine should be considering these additional industry leading safety practices as an opportunity for improvement and I remarked that I would like to see a formal consideration for both of these safety systems when conducting my next inspection.

It was noted the shuttle cars in this panel use trailing cables that are 25mm as opposed to the usual 35mm and I asked Mr Bridgeman to confirm that the protection settings from the fault load study for the panel were for this size cable. This had been an issue at another mine.

Using 25mm trailing cables instead of industry standard 35mm. EEM unable to say whether electrical protection system for fault load have been set correctly

Development substation TXKOI was inspected and was in reasonable order. Mr Stansfield explained the dual wound secondary of the transformer and how paralleling of theses windings is prevented.

We discussed the use of Variable Voltage Variable Frequency (VVVF) shuttle cars and the controls that mines are installing to reduce the electrical hazard for their use. The mine currently has wide band earth leakage protection on outlets as well as the "onboard" Drivestop protection system. The power systems study for the Development panels has been completed. I stated to Mr Bridgeman that electrical tradesmen should be conducting scheduled monitoring of the shuttle cars and continuous miner's earth continuity readings and are made aware of the purpose for this monitoring.

VVVF electrical checks and power training for Electricians needed.

Administration

Mr Bridgeman and I reviewed the electrical HPIs and NRIs that had taken place since the last inspection:

Incident 1 1/01/2016 - Emergency stop cable damaged on Shuttle car - We spoke at length about the requirement to regularly and thoroughly conduct examinations of mining equipment and machines with a focus on operator awareness. As I cannot locate the investigation for this incident I have asked that it be sent through to me.

Incidents 07/01/2016 & 03/01/2016 - Cable damage on Loaders - As the failure mode for these cables is damage by the drive shaft we discussed theses HPIs in some detail. The robust securing of these cables is a focus for Mr Bridgeman as is ensuring that tradesmens write their reports in the area and district that the equipment is operating in so that the resetting of faults can be identified by oncoming tradesmen.

Incident 16/10/2016 - Shuttle car cable damaged on roof bolt - This incident was discussed and there are no further issues.

Incidents 02/10/2015 - Alternator on Driftrunner had flameproof bung missing - As I cannot locate the investigation for this incident I have asked that it be sent through to me.

Incident 31/08/2015 - Damaged Shuttle car cable while tramming to the bootend - We discussed the manner of how the damage occurred in some detail and Mr Bridgeman informed me that the reeler compartments have been altered so the overspool cut-out switch operates before the cable can be jammed up.

Incident 20/08/2015 - Damaged miner cable while flitting - As I cannot locate the investigation for this incident I have asked that it be sent through to me.

Incident 01/07/2015 - Non-certified torch with magnetic base found in Minecruiser - We discussed the incident and I referenced that similar occurrences have been observed at other mines.

Electrical Incidents on Grosvenor there is no Incident Investigation reports for 3 of the 7 incidents

There was a series of HPI incidents in 2015 that involved Paquin plugs being damaged on the continuous miners. Initially there was less than adequate assistance from the OEM to assist the mine which was a contributing factor in the repeat of the damage however this appears to have been improved. The mine made a series of reports to the Inspectorate on the progress of replacement of these plugs and cables which has prevented a reoccurrence.

Series of HPI's for Paquin electrical plugs. Safety Alert by Department

A debrief was conducted with Mr Bridgeman and all points raised in this MRE were noted.

As specified under section 128 (d) of the Coal Mining Safety and Health Act 1999 (to help persons to achieve the purposes of this Act by providing advice and information on how the purposes are to be achieved) two recommendations form part of this MRE to address the aforementioned issues raised within this MRE.

Number	Recommendation	Due Date
1	Cable Management in Development Panels	NIA

That the mine considers the management practice of ERZ Controllers signing-off on the panels cable management.

Number	Recommendation	Due Date
2	UPEE Management	NIA

The mine is to review and improve the process of equipment being signed in and out of the underground by both the person taking it and by the CRO.

Two recommendations (No or Little Legal Standing).
Cable Management in Development Panels
Uncertified Portable Electrical Equipment review failed process.

Electrical Reporting Structure

"Not robust".
No shift sign off? Against the Act and Regulations?
Also, another Contractor Management Failure.

CRO
Not as familiar as stated about methane detector in bypass. 30-minute alarm for detector in bypass

1. **Review and improve the process of equipment being signed in and out of the mine by both the person taking it underground and by the CRO.**

Uncertified Portable Electrical Equipment system and paperwork not filled out or signed off correctly
Recommendation (Little or No Legal Standing).

Pit Bottom substation (1st Installed).

Problem since Commissioning about possible not isolating of 110 v control in panel. Temporary laminated information sign. Again something planned for Grosvenor (1 month).

Carbon copy high voltage documentation suggested only

AS/NZS 2290.3 Electrical equipment for coal mines- Maintenance and overhaul/Part 3 Maintenance of gas detecting and monitoring equipment

Opportunity for Improvement or Non-compliance

Electrician work orders.

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Trailing Cables

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Variable Voltage Variable Frequency (VVVF) shuttle cars and the controls that mines are installing to reduce the electrical hazard for their use.

VVVF electrical checks and power training for Electricians needed.

ADMINISTRATION

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Two recommendations (No or Little Legal Standing).
Cable Management in Development Panels
Uncertified Portable Electrical Equipment review failed process.
No action dates because no legal standing.
Was it ever followed up

Paul Sullivan
Inspector of Mines
Central Region