

# Queensland Government

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Mine Name	Mine ID	Operator
Grosvenor Coal Mine	M102976	Anglo Coal (Grosvenor

Activity Type	Region	Activity Date
Inspection	Central	09/08/2016

Management) Pty Ltd

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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.

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

Mr Bridgeman provided me with an overview of the mine's current development mining sequences, mining equipment and machinery in use, production rates and progress with strata management as well as issues regarding methane levels at the Longwall Tailgate.

As this was my first inspection of the Longwall Mr Bridgeman described its electrical equipment and infrastructure in detail.

At my request he also explained the engineering management structure of the mine including shift engineers and co-ordinators and their reporting process.

A review of my last MRE (08/03/2016) was then conducted with the salient points being:

- o Trade shift reports are scanned and emailed to engineering and maintenance staff including the EEM and MEM. This process allows Mr Bridgeman to readily review these reports and note any comments regarding compliance issues. The Shift Engineer reports also follow the same process and are formally reviewed by the Maintenance Superintendent.
- The management of uncertified portable electrical equipment (UPEE) now has a scheduled weekly workorder requiring the Shift Engineers to review the UPEE logs and authorisations of personnel and equipment as well as the sign in / sign out register to confirm it is up to date.

- There was a consideration to lower gas monitors to ground level so that calibrations and testing could be done by tradesmen without requiring a ladder however there is a concern regarding damage for the cable loop.
- Quotes have been obtained for the installation of colour changing area lighting such as green for "Go" (safe to approach) and red for the opposite to support the mines "Go / No Go" zone procedures on shuttle cars and breaker feeders as well as continuous miners. They are currently working through the change management process for their introduction onto the equipment. The mine is to be commended for adopting this industry leading practice and they should maintain a focus on the implementation of this safety system.
- Mr Bridgeman has altered the electrical shift reports for tradesmen to note the earth resistance readings of equipment in their panels.

Shift Tradesman Reports scanned and emailed to engineering and maintenance staff as well as EEM and MEM.

**No sign off of reports, what evidence they are read and actioned**

Weekly overview of Uncertified Portable Electrical equipment by Shift Engineers.

**Should be daily as part of their normal duties**

Gas monitors positions in roadways. Electricians need ladder to do calibration. Company do not want to lower due to mobile machinery damage.

Mr Bridgeman and I reviewed the electrical incidents that have taken place since my last inspection:

Incident 24/03/2016 - Shuttle car trailing cable damaged - Mr Bridgeman described the way this cable had been damaged in some detail and there is now a weekly workorder to check the shuttle car conveyor booms for sharp edges.

Incident 27/04/2016 - Shuttle car trailing cable damaged - The major contributing factor to this incident was that the road had not been set up as a wheeling road. As I cannot locate the investigation report I have asked for it to be sent through to me

Incident 16/05/2016 - Damaged lighting cable on Shearer - A guard had been removed which protected the cable and its enclosure. The guard has since been installed back into its position however I have questioned why it was removed and then not replaced originally. As I cannot locate the investigation report I have asked for it to be sent through to me.

Incident 09/06/2016 - Damaged Betaworks enclosure on both a DCB and a substation - The cause for the window damage on both pieces of equipment was that after they had been opened there is a specific sequence and torque required to bolt the enclosure cover back on. Though the correct torque level was applied, the bolts were not done up in the correct sequence which placed excessive stress onto the glass insert causing them to shatter some time later. Mr Bridgeman indicated that the sequence to tighten the enclosure bolts was not known to the tradesmen who carried out the work. This information now is provided on the workorders for the task. As I cannot locate the investigation report I have asked for it to be sent through to me.

Incident 28/06/2016 - A non intrinsically safe (IS) solenoid cable was pulled through a flameproof gland on a Continuous Miner - The mining conditions were a major contributing

factor. This enclosure is mounted lower than on the other miners. As I cannot locate the investigation report I have asked for it to be sent through to me.

Incident 08/08/2016 - 240 volt area light and lighting cable damaged - The damage was caused by a large metal section of a "W" strap being loaded onto the belt and contacting the light and its cable.

#### Electrical Incidents

**4 of 6 listed Electrical HPI's have no Investigation report available on site and Inspector asks for them to be located and forwarded. AGAIN**

I remarked to Mr Bridgeman that though there was no trend in the HPIs reported, the volume and types of incidents, particularly the cable damages, is a concern that may require to be closely monitored. Mr Bridgeman showed me the new "Production Readiness Checklist" that is far more thorough than the previous one and has better prompts to assist in the development panels operating to the expected standards. It was noted during the inspection that the previous checklists were still in use and I have recommended:

- 1 . That the mine replace the old "Production Readiness Checklist" with the latest version and that the crews are made aware of the change or reasons why this cannot be undertaken. .

#### Production Readiness Checklist.

Should have been part of system Panel Standards from start of mine.

New Checklists Bridgeman boasts about are not even in use at the Grosvenor mine  
Recommend that the old ones be replaced, and crews made aware from an Inspector.  
Recommendations mean nothing and he does nor even recommend proper training

From my previous MRE comments Mr Bridgeman explained in further detail the process that is followed to train and authorise tradesmen to be able to conduct high voltage switching for access. From his description this process is fairly generic to what is also undertaken at other mines. We further discussed how non standard switching practices, such as the annual high voltage continuity and insulation tests are planned and undertaken. I have asked Mr Bridgeman to send through to me this process. Mr Bridgeman has viewed the draft switching sheets for the 3.3Kv restrained outlets and I have recommended that:

1. The current draft switching sheets for the 3.3Kv are introduced into the Longwall high voltage switching process or reasons why this cannot be undertaken.

Maintenance Superintendent Mr Brad Stansfield introduced me to the electrical tradesmen who were taking part in a scheduled "trade talk" in a nearby room. These talks are conducted every three months and cover a variety of topics and themes. The format is well done and covers critical electrical safety information and general topics.

Draft Switching for 3.3kV in Longwall to be introduced by Recommendation of Inspector.

Longwalls have 3.3kV electrical transformers etc.

**WHAT SWITCHING PROCEDURES WERE THEY OPERATING ON UP TO NOW.**

Electricians undertaking 3 monthly "trade talk".

What a coincidence that 3 monthly talk happens to be on the same day as a scheduled Electrical Inspector visit.

I met Engineering & Maintenance Manager Mr Chris Carroll and explained to him my plan for today's inspection and overall expectations.

Automation Engineer Mr Danny Sellen provided an overview of the Longwall automation project. This project incorporates the Joy State Base system. The Chain Tensioner is now fully automatic and is running well now. The face and Tailgate were running in automatic however there are currently issues with the Tailgate and it is back in manual. As part of this project they are currently installing conventional cameras around the BSL, Maingate and Tailgate as well as thermography cameras at the Maingate and BSL. There were cameras on the Shearer however they were removed due to height / clearance problems. The sloughing plates are being re-engineered to allow these cameras to be mounted back onto the Shearer. These cameras also have automatic water sprays to clean them. I was particularly interested in the use of a thermography camera for detecting CMWs accessing along the side of the BSL and I have asked to be kept informed of its progress as it will be an industry leading practice if successful.

Prior to undertaking an underground inspection, I asked Control Room Operator (CRO) Mr Cody Gray to indicate what gas monitors were in alarm and how they were being managed. Mr Gray showed me that Real Time (RT) monitor 37 - 17 to 18 c/t C Heading Tailgate 101 was in alarm and that a ventilation change was being done to allow men to work in the Longwall Tailgate. I asked Mr Gray to indicate if there were any "nuisance" alarms that appear regularly. From his description and the alarm log, this monitor and Tube Bundle (T B) 27 Tailgate 101 dogleg return - CH<sub>4</sub> reading also are normally in alarm. It is poor practice for CROs to become used to resetting the same alarm repeatedly and as part of this MRE I have recommended that the mine:

1. Forward me a plan to address the constant alarming of these two gas monitors or reasons why this cannot be undertaken.

### CONTROL ROOM

Real time Gas Monitor #37, located at 17 to 18 c/t in C heading Tailgate are in alarm and ventilation change being done to allow men to work in the Longwall return.

Non production shift apparently on Longwall.

### **What vent changes had to take place to allow men to work in return?**

**Is it to get methane below 1% in the tailgate to allow diesel and electrical machinery to be deployed?**

Changing ventilation pressures across the goaf as well as contributing to changes in methane migration from the goaf also contribute to spontaneous combustion occurring in a goaf over time.

Tube bundle return 101 longwall continually in alarm. Excessive methane continually triggering the alarm.

Accompanied by Mr Bridgeman and Mr Sellen an inspection of the underground workings was undertaken and the following points noted:

### Longwall 101

The NERZ / ERZ boundary is located just outbye of the last open c/t and there is a NERZ / NERZ boundary outbye at the commencement of the panel (2 to 3 c/t). Mr Sellen informed me that there are two CH4 monitors located on both the Maingate and Tailgate drives as well as two on the Shearer. From his description of their alarming and tripping functions they appear to be compliant to the CMS&H Regulations.

Substation TXJO1 was inspected and Mr Sellen explained the differences between the construction and operation of this type of substation compared to what is common throughout the industry such as having an air and water cooled transformer tank instead of a nitrogen filled one and the protection systems associated with it. The transformer has the capacity to supply variable voltage variable frequency (VVVF) AFC drives however the current drives are Voith fluid couplings. The DCB supply is configured as two parallel feeders and a single feeder. We then went through what switching and earthing process would be followed to gain access into the 3.3Kv main enclosure. This process involves hand written switching sheets. I remarked to both Mr Bridgeman and Mr Sellen that as this process does not change, the use of pre-written sheets should be considered. The housekeeping in the c/t was adequate and there was good cable identification on the substation.

At bottom of page

Transformer TXJO1

Hand written switching sheets.

Inspector says pre-written procedures should be considered.

HOW WEAK can he be when it comes to High Voltage Switching procedures

Hydraulic pump supply cable PMP - 04 was plugged into the earth receptacle on the substation however there was no tag on it indication why this was done. I remarked to both Mr Sellen and Mr Bridgeman that it may timely to highlight to tradesmen the sites requirements and expected use of out-of-service and information tags.

Out of Service and Information Tags not being put on cables where required as per Site Tagging Procedures and Electrical Procedures.

Inspector no need to train and assess and make sure the Tagging procedure is followed.

“Timely to highlight to the tradesmen”. Beyond WEAK, Against the Regulations.

Pump stations LHJ03 and LHJ04 were in reasonable order and there were no issues apparent.

Walking the monorail inbye I noted to Mr Sellen and Mr Bridgeman that near breakpoints 10 and 11 the cables and hoses looked very close to contacting the secondary support. This information was later conveyed to ERZ controller in the panel Mr Darren Bridgeman.

Mr Sellen explained the expected purpose and functionality of the Remote Operating Centre (ROC) with regard to Longwall automation however it is currently in a decommissioned state.

There is a strobe located near the boot-end which triggers when either the Shearer is coming into the Maingate or the BSL push is primed. This system is being adopted in most mines to

reinforce the "No -Go" zone alongside the BSL when these events are about to occur. The mine is to be commended for its installation. I would recommend the following:

- 1 . Signage stating the purpose of the strobe and what to do when it is flashing should be prominently displayed near the strobe or reasons why this cannot be undertaken. .

Though there is currently is adequate clearance between the Megabolt secondary support tails and the top of the DCB this should be formalised into the panel checklist to ensure that the situation does not change and if it does it is managed accordingly.

The CME and DCB were both in reasonable order with good cable identification and there were no issues apparent.

We discussed how the remote isolation process is used on the Longwall, the tasks that could be carried out and its functionality. There are some differences in how the isolation is achieved to what is normally followed however there is both visual and audible confirmation when remote isolation is both granted and cancelled. As both Mr Sellen and Mr Bridgeman were not quite sure of the tasks and any training that is required I have requested Mr Bridgeman to forward through the flowchart to conduct remote isolation as well as tasks that can be performed under this type of isolation on the Longwall. A general discussion was also undertaken regarding the maintenance requirements for equipment and systems that have a Safety Integrity Level (SIL) as their engineering confirmation.

**Neither could tell what different Isolation procedures are needed for remote operation and not sure of tasks and any training required**

**How can the Automation Engineer possibly do his job without knowing this?**

**Inspector asks for flowchart of conducting remote operation as well as tasks that can be performed and using systems that use Safety Integrity Level (SIL) as an engineering confirmation**

I confirmed with Mr Sellen that the CO monitor for the boot-end of the Longwall conveyor stops the BSL but continues to allow the conveyor to run. This is in keeping with the recognised practice for combustion detection.

The inter and intra chock cables were loomed to a high standard with the exception of the DAC communication cables which are run across the front of the chocks to a poor standard. Mr Sellen explained that the cables were too short to be loomed correctly through the back of the chock and that they would be eventually replaced with the correct length of cable and the standard improved to that of the other cables. The in chock power supplies, chock controls and segregation barriers were mounted in such a way as to afford them a good level of protection.

**Communication DAC cable not correctly installed from the start**

The Maingate and midpoint cables were well contained / managed and there were no issues apparent.

I discussed the trigger action response plan (TARP) for the maintenance and use of the chock "flippers" with Mr Darren Bridgeman however he was not sure of the number of flippers that can be out in a row. As these are critical pieces of equipment for strata control my expectation is that the mine would focus on training for these type of TARPs.

**TARP for number of Flippers that can be non operational.**

**ERZC had no idea.**

**How can he be an ERZC for the longwall panel?**

**Mandated in standards especially for heavy roof conditions. Well it is at normal Mines**

Mr Darren Bridgeman explained the ventilation changes that were being done to decrease CH4 coming out of the goaf.

The NERZ / ERZ gas monitoring station outbye of 18 c/t was in reasonable order and the monitor was within its calibration date. The electrical report book had a good format and it had been filled out correctly with no issues apparent.

I was introduced to Longwall electrician Mr Murray Shepperson and at my request he explained the process he would follow to isolate and access the motor terminals on the Crusher motor. He explained that there were two methods to conduct this isolation either via the 'IAI & A2" (complex isolation) process or removing the restrained plug from the outlet. He described both methods in detail and demonstrated a sound knowledge of both methods including the requirement to "test for dead". He did not have a non-contact voltage proximity detector available to him. An SCP accompanies this MRE requiring the mine to ensure that tradesmen have ready access to this testing equipment and are aware of the requirements to use it.

2 different ways to isolate crusher motor. 1 method is complex (likely official proper method), or just removing 1 plug.

No voltage detector carried by the Electrician.

Mr Shepperson also explained to me the criteria for the tasks that can be done under remote isolation and that there was a standard work instruction (SWI) for this.

#### Development Panel MG 1 03

Panel substation TXK02 and Beltstarter TXLII were inspected. The housekeeping was reasonable for both and there was clear cable identification. There were no issues apparent with TXK02 however the arc venting panels on TXLI 1 were very small given the size of the low voltage end enclosure and I have asked Mr Bridgeman to confirm that a study for arc flash management had been conducted for the Beltstarter and that the arc vent panels were the correct size for effective fault management. The remote operation ability for both these plants is a good initiative.

The communications enclosure for the Longwall has been installed to a high standard.

The electrical report book had a good format and it had been filled out correctly with no issues apparent.

ERZ Controller Mr Steve Riches explained what work was being undertaken in the panel and a general discussion on the hazards we may encounter and their controls also took place.

I was introduced to Development electrician Mr William Wormall and at my request he explained the process he would follow to undertake the gas monitoring calibrations on an auxiliary fan. He did this in a competent manner and from his description of the monitor's tripping / alarming functionality it appears to be compliant to the CMS&H Regulations.

Distribution Control Box (DCB) DBK04 was in reasonable order and there were no issues apparent.

Auxiliary fan AFK0I was in good order and was within its overhaul date (November 2013). The gas monitor was within its calibration date. The gas monitoring reset actuator and the fan start button were secured with ERZ Controller's locks.

The non-walk side (NWS) access to the conveyor was barricaded and signed as there was no emergency stop lanyard on this side of the conveyor.



## Administration

We then reviewed the following safety alerts:

- o Mines Safety Alert 332 "Issues Surrounding the Use of Semi Conductive Insulation" - Due to recent incidents at mine sites, this safety alert recommends that electrical tradesmen understand the characteristics, specifically creepage and clearance distances, associated with this type of insulation screening. Mr Bridgeman was not aware of this alert and I stated that I would forward it through to him.
- e Mining Safety and Health Newsflash "Shuttle Car Automatically Re-powered in ERZI" - Mr Bridgeman was aware of this Newsflash and stated it would be part of the "trade talk" to electricians.

There had been an incident at another mine where a person had produced a fake Queensland electrical license to gain employment with a contracting company at the mine. The attempted fraud was identified during the mine's electrical induction process that requires the EEM or his delegate to interview the candidate and review their work history and experience. This matter has been investigated by the Electrical Safety Office (ESO). Mr Bridgeman stated that the electrical induction process at the mine requires the production of the electrical license card and not just copies on paper.

We were then joined briefly by Site Senior Executive (SSE) Mr Adam Foulstone and I gave him an overview of the inspection.

A full debrief of the inspection was undertaken with Mr Bridgeman and all points raised in this MRE were noted.

As specified under section 128 (g) of the Coal Mining Safety and Health Act 1999 (if unsafe practices or conditions at coal mines are detected, to ensure timely corrective or remedial action is being taken and, if not, require it to be taken) a Substandard Condition or Practice (SCP) forms part of this MRE to address the aforementioned issues raised within this MRE. 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) four recommendations form part of this MRE to address the aforementioned issues raised within this MRE.

**Shift Tradesman Reports scanned and emailed to engineering and maintenance staff as well as EEM and MEM.**

**No sign off of reports, what evidence they are read and actioned.**

Weekly overview of Uncertified Portable Electrical equipment by Shift Engineers.

**Should be daily as part of their normal duties**

Gas monitors positions in roadways. Electricians need ladder to do calibration. Company do not want to lower due to mobile machinery damage.

Electrical Incidents

**4 of 6 listed Electrical HPI's have no Investigation report available on site and Inspector asks for them to be located and forwarded. AGAIN**

Production Readiness Checklist.

**Should have been part of system Panel Standards from start of mine.**



New Checklists Bridgeman boasts about are not even in use at the Grosvenor mine  
Recommend that the old ones be replaced, and crews made aware from an Inspector.  
**Recommendations mean nothing and he does not even recommend proper training**

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Longwalls have 3.3kV electrical transformers etc.

**WHAT SWITCHING PROCEDURES WERE THEY OPERATING ON UP TO NOW?**

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CONTROL ROOM

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Remote Isolation Process

Neither could tell what different Isolation procedures are needed for remote operation and **not sure of tasks and any training required**

**How can the Automation Engineer possibly do his job without knowing this?**

Inspector asks for flowchart of conducting remote operation as well as tasks that can be performed and using systems that use Safety Integrity Level (SIL) as an engineering confirmation

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No voltage detector carried by the Electrician.

ADMINISTRATION

Bridgeman

Not aware of Safety Alert 332

Aware of Alert Shuttle Car Auto Repower in ERZ1. Part of Trade Talk, No training or assessing

FAKE ELECTRICAL LICENSE used at another mine

**All Substandard practices and Recommendation no legal standing.**

Test for Dead Instruments substandard

Recommend

3.3kVswitching sheets

Forward pan to address constant alarming of 2 gas monitors

Signage for flashing strobe in Longwall

Production Readiness Checklist for electrical installations and trailing cables

Number

1

Substandard Condition or Practice

Electrical "Test for Dead" requirements

Due Date

0411012016

The mine is to ensure that tradesmen have ready access to non-contact voltage detectors when underground and are aware of the requirements to both carry and use them.

<u>Number</u>	<u>Recommendation</u>	<u>Due Date</u>
2	3.3 KV Switching Sheets required	N/A

The current draft switching sheets for the 3.3Kv are introduced into the Longwall high voltage switching process or reasons why this cannot be undertaken are provided to the Inspectorate.

<u>Number</u>	<u>Recommendation</u>	<u>Due Date</u>
3	Frequently occurring gas monitoring alarms	NIA

Forward to the Inspectorate a plan to address the constant alarming of the two gas monitors noted in the MRE or reasons why this cannot be undertaken.

<u>Number</u>	<u>Recommendation</u>	<u>Due Date</u>
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4	Signage to indicate the purpose of a flashing strobe NIA	
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Signage stating the purpose of the BSL warning strobe and what to do when it is flashing should be prominently displayed near the strobe or reasons why this cannot be undertaken are to be sent to the Inspectorate.

<u>Number</u>	<u>Recommendation</u>	<u>Due Date</u>
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5	Production Readiness Checklist	
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That the mine replace the old 'Production Readiness Checklist' with the latest version and that the crews are made aware of the change or reasons why this cannot be undertaken are to be sent to the Inspectorate

Please provide a written status report on each SCP together with the actions taken to address each item by their due dates

Paul Sullivan  
Inspector of  
Mines  
Central Region

A handwritten signature in blue ink, appearing to be 'Paul Sullivan', written in a cursive style.