AngloAmerican

Anglo American Longwall Engineering Dust Controls

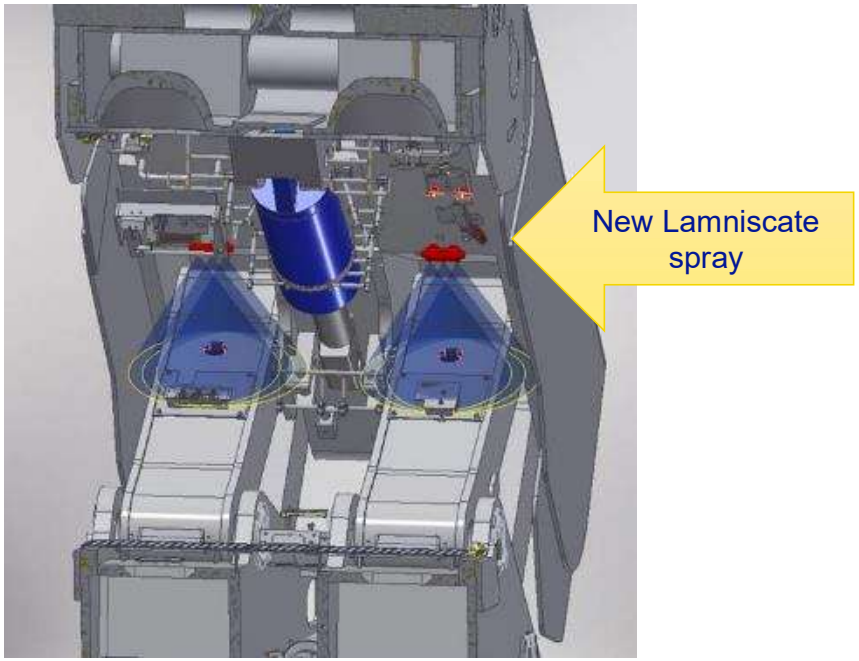
November 2025

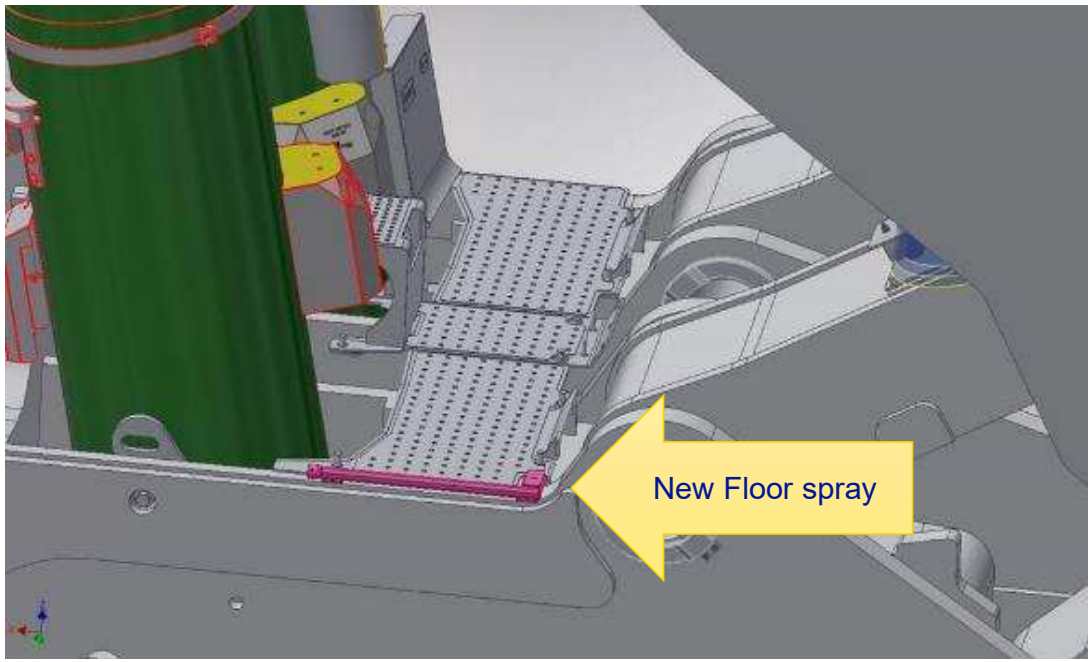
Engineering Dust Controls

- Dust control at both Moranbah North and Grosvenor mines is incredibly challenging. This is due to:
  - Poor strata conditions frequently requires manual intervention by operators.
  - Friable coal roof able to fall between supports easily.
  - High face heights increase spall, and require a rear walkway, and front walkway to be kept clean.
- During 2023 / 2024 both mines were subject to directives to reduce dust exposure to CMW's necessitating change to both operating practices and engineering controls.
- This presentation will focus on several engineering controls that have been implemented at both mines to improve dust suppression on the longwall faces.
- The development of these was done in conjunction with the workforce, OEM's, and universities and backed with both real time and gravimetric testing of CMW's personal exposure levels.
- Resourced maintenance strategies have also been developed to ensure ongoing maintenance of the systems.

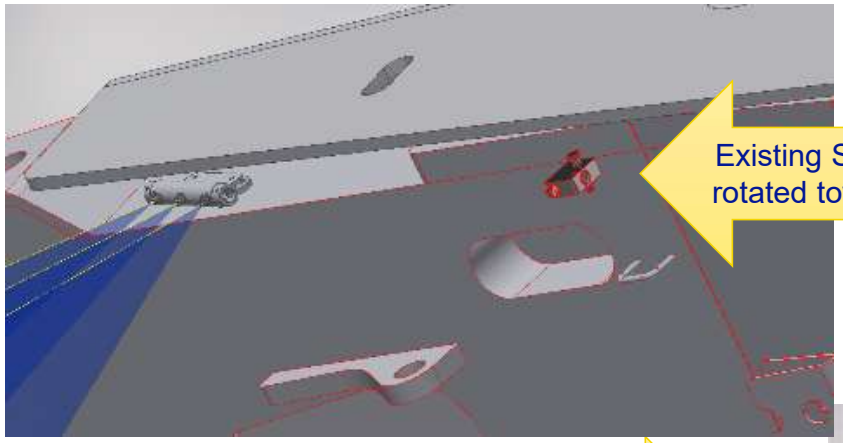
	Outbye Scrubber ()	Acceptable Limits	Condition	Initial
	Remove, hose out demister and access condition The demister exceeds 40 kg and requires a two-person lift	Clean, no damage	1 | 2 | 3	
	Remove, hose out dust scrubber filter and access condition.	Clean, no damage, < 22 kg	1 | 2 | 3	
	Hose out collection box	Clean	1 | 2 | 3	
	Clean filter sump and drain holes	Clean, drain holes clear	1 | 2 | 3	
	Inspect door gaskets condition	No cuts, splits or tears	1 | 2 | 3	
	Outbye Scrubber Sprays (7) ()	**Acceptable Limits**	**Condition**	**Initial**
	Inspect sprays for damage	**Normal:** No damage all operational **Level 1 TARP Trigger:** < 2 scrubber sprays blocked or not operational on a scrubber. **Level 2 TARP Trigger:** > 2 & < 4 scrubber sprays blocked or not operational. **Level 3 TARP Trigger:** More than 4 scrubber sprays blocked or not operational.	1 | 2 | 3	
	Test 'back flush' spray nozzles Remove filter to access back flush sprays	Not blocked, effective spray pattern	1 | 2 | 3	
	Test 'system' spray nozzles	Not blocked, effective spray pattern	1 | 2 | 3	
	Outbye Scrubber Ducting ()	**Acceptable Limits**	**Condition**	**Initial**
	Inspect scrubber ducting for damage and / or blockages.	**Normal:** No damage or blockages **Level 1 TARP Trigger:** Build up of material within ducting resulting in dust	1 | 2 | 3	

Roof Support Dust Suppression





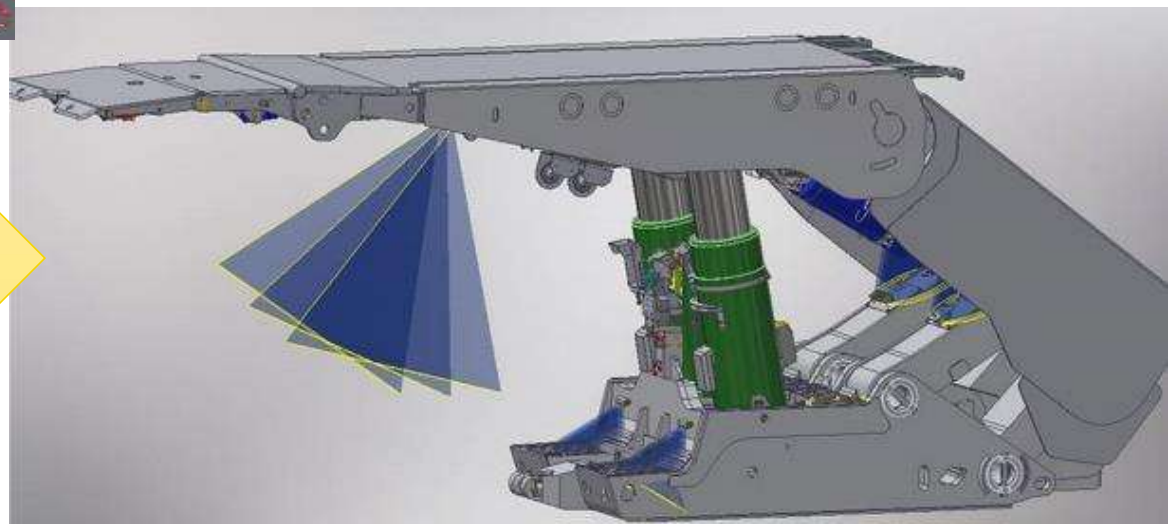
Roof Support Dust Suppression



Existing Spray to be rotated towards face

Example of expected Spray pattern/ coverage

Concept is to catch float dust, wet coal on AFC and push dust back towards face



Roof Support Dust Suppression

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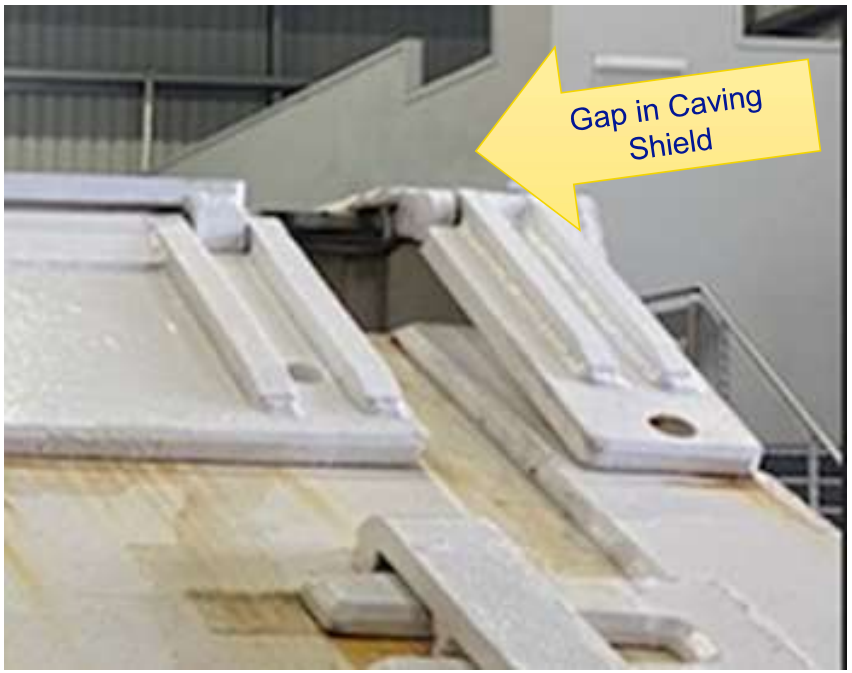
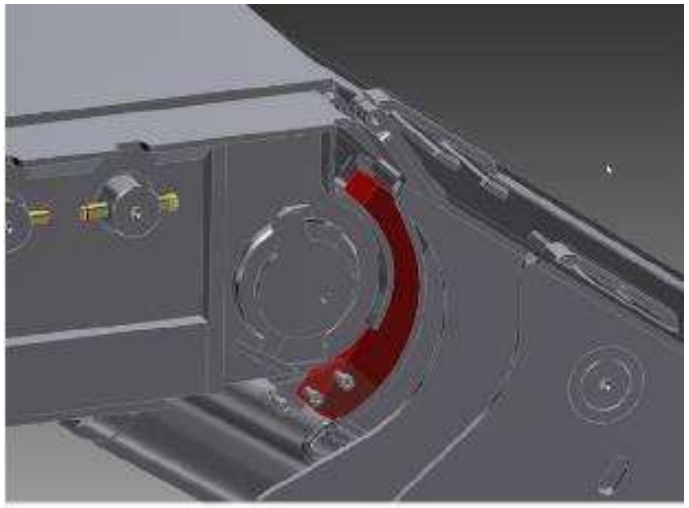


Roof Support Dust Suppression



Video of Trial with no silent seal or foam

Video of Trial with Foam Insert fitted

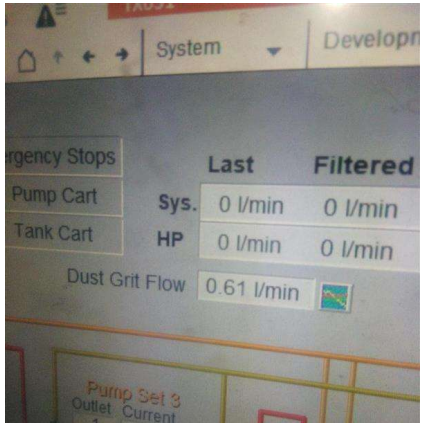
Wetting Agents

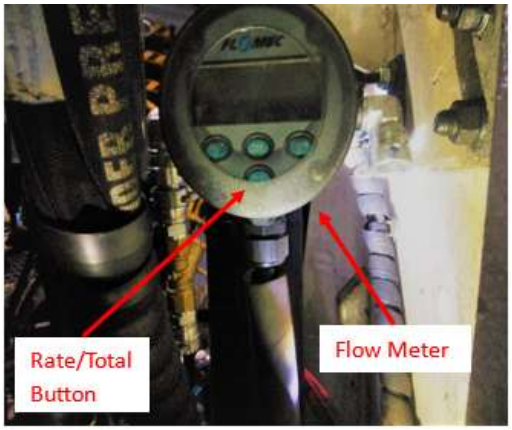
DUST GRIP is a wetting agent designed to accelerate water penetration into areas where dust is a hazard.

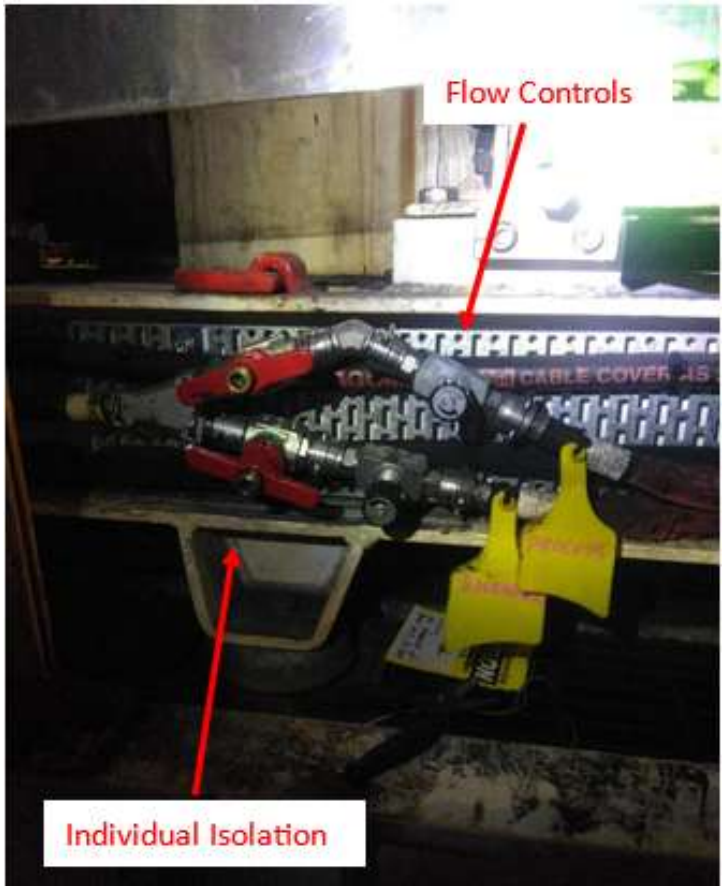
Flow meters have been installed at both pump stations.

This allows the incoming water supply to be correctly dosed as per OEM guidelines for the shearer & LW services

Project included electrical / PCS connections



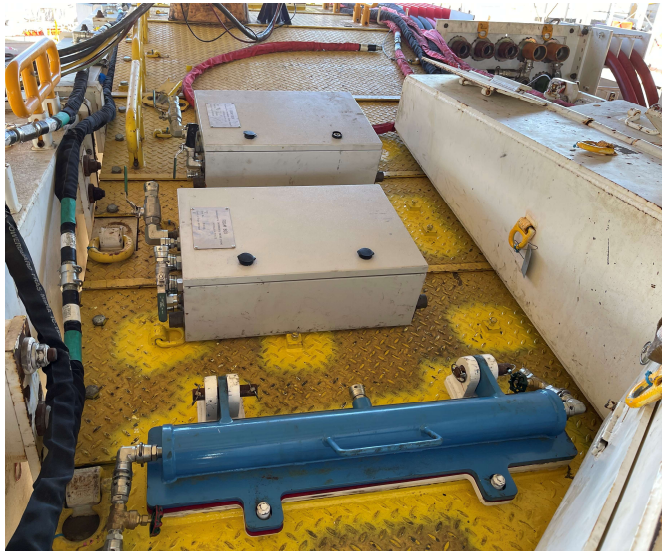


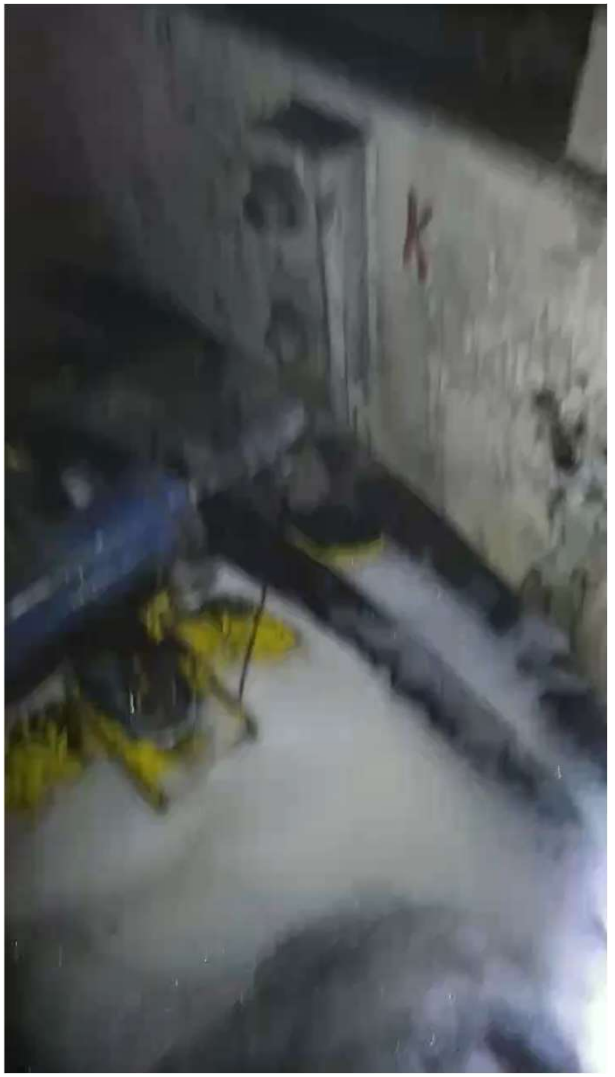


Wetting Agents

Configured foam generating unit into BSL circuit.
2 x foam injection bars installed both before and after crusher.

Modification of existing Foam Dosatron unit to improve reliability
To be replaced with Dosatron D20SAF.





Wetting Agents

Foam Booms spraying foam onto AFC chain

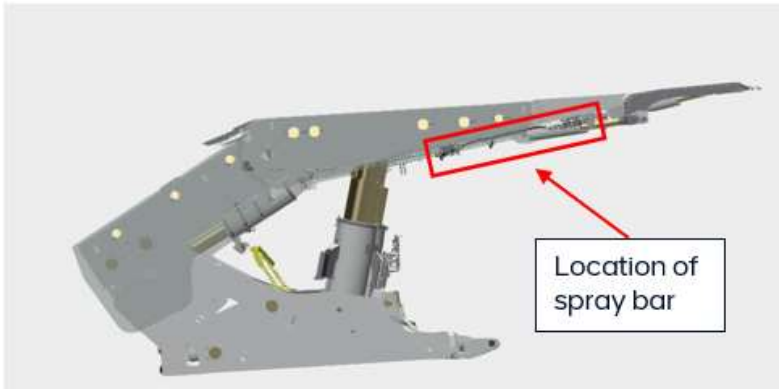
New style PRV

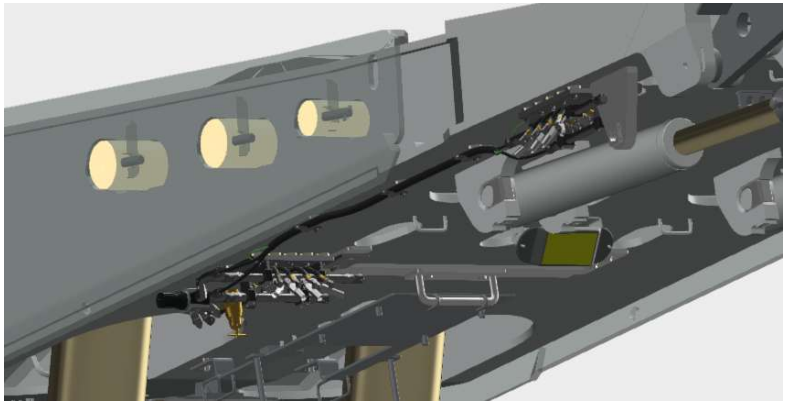
Wetting Agents

Canopy Spray Bars

Work conducted with OEM to design and develop a spray bar to be located underneath the shield supports.

Air Water fog sprays installed at 20 support intervals and operating on AFC running via solenoid. Can be turned off electronically via IFC or via shearer automatics.





Panline Spray Bars

Panline fish plates installed at 5 support intervals and operating on AFC running solenoid driven. Can be turned off electronically via IFC or manually).

Modification to sprays has been in consultation with industry expert Dr. Jon Roberts (UoW Lecturer in Fluid Mechanics)

2019 PhD – ‘Characterisation & Numerical Modelling of Sprays for Airborne Dust Suppression’.

BSL Dust Controls

BSL and Bootend tent along with

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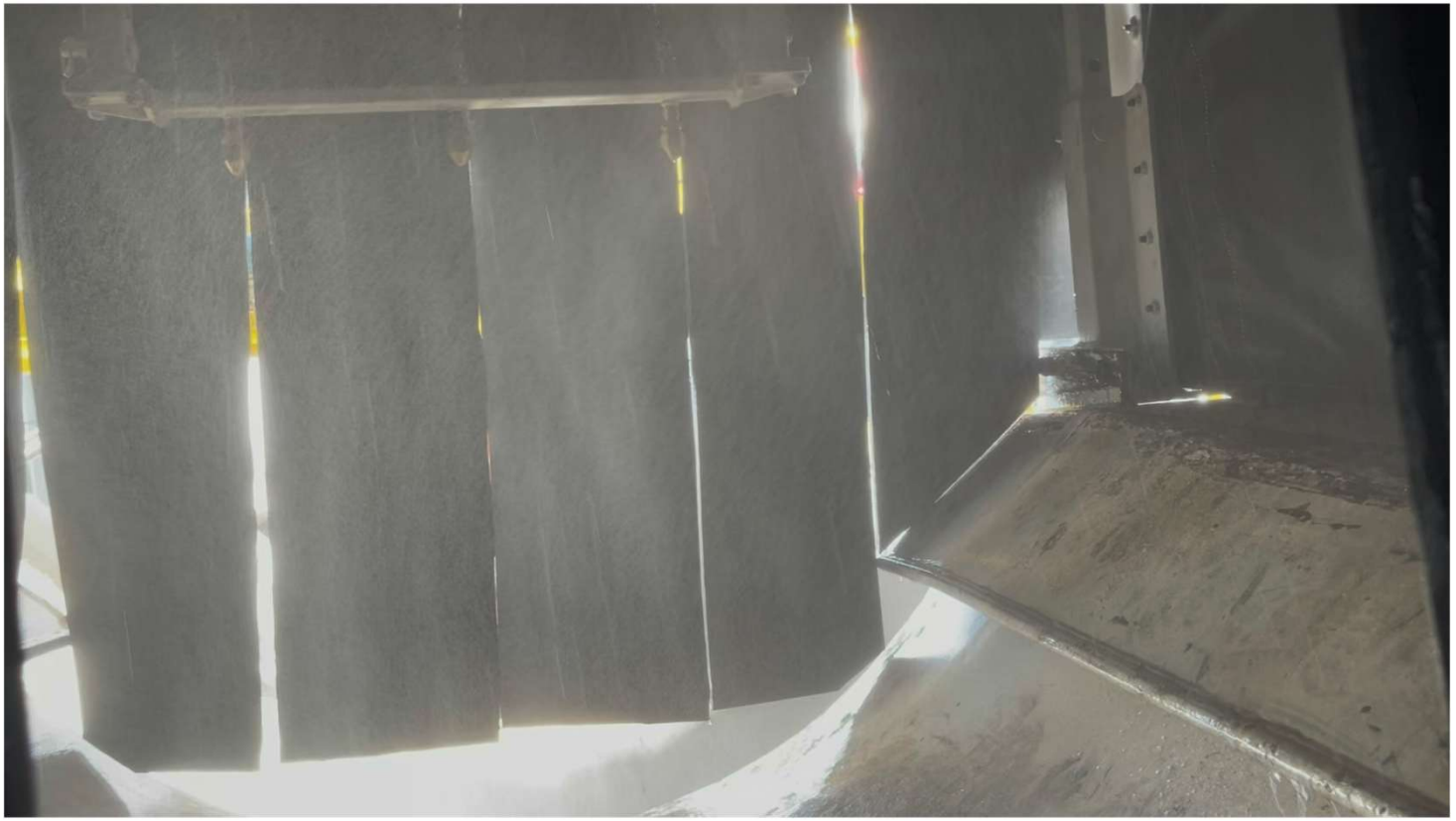


BSL Dust Controls

BSL scrubber maintainability improved with increased access, additional valving for directing air, and improved sprays to clean filters.

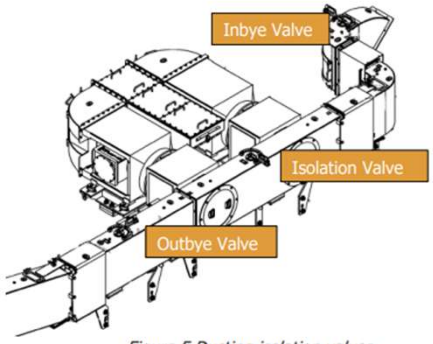


Figure 5 Ducting isolation valves.

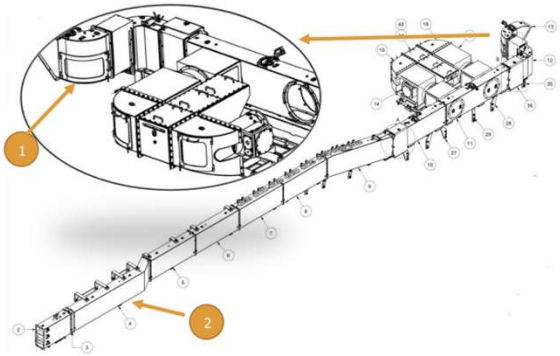


Figure 1 Ducting

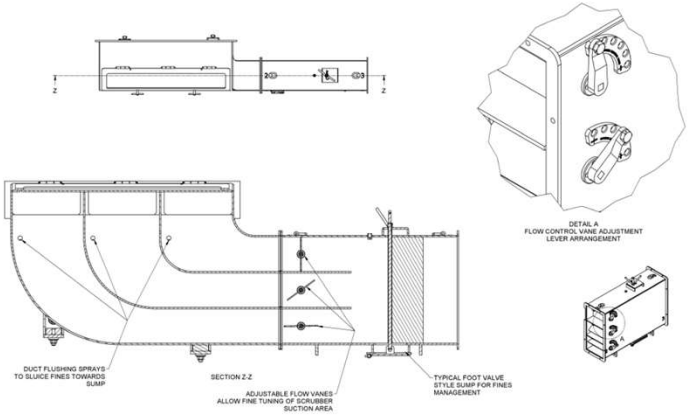


Figure 3 Adjustable Flow Vane setup

[redacted]

BSL Dust Controls

Testing of scrubber settings, valve positions, as well as confirming even distribution of suction at the dust hood was completed by independent 3rd party ventilation service.

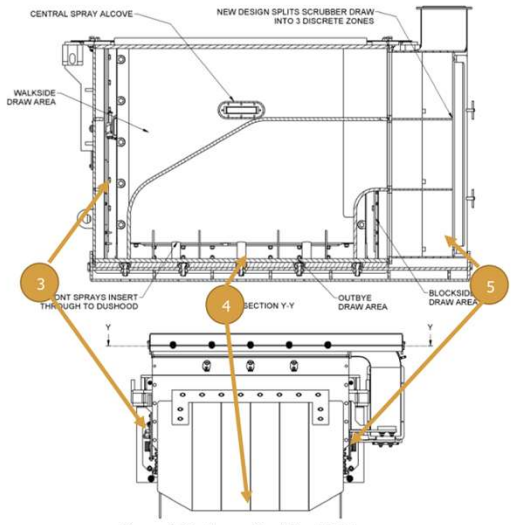
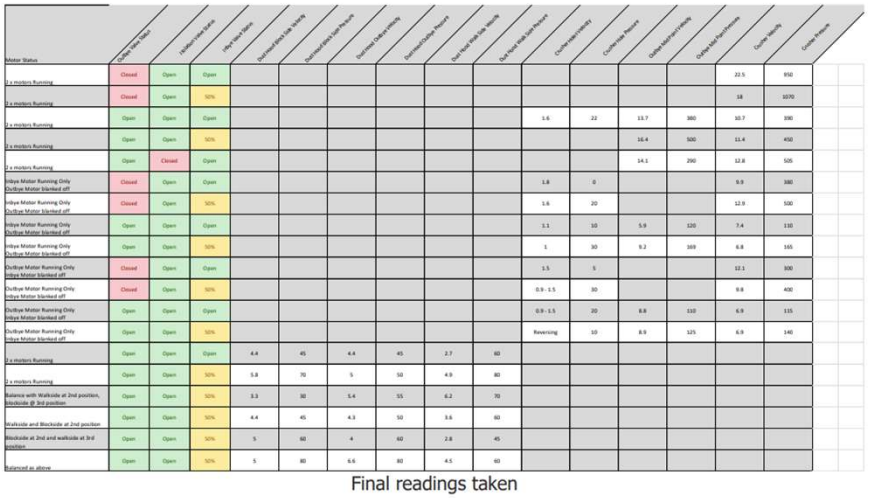
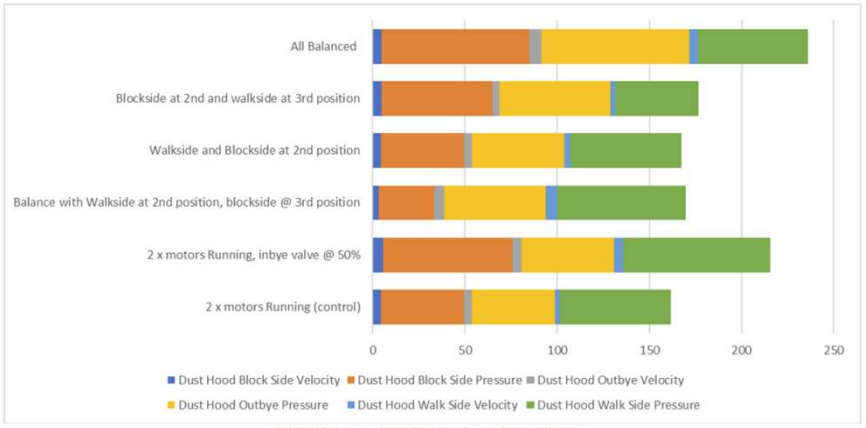


Figure 2 Discharge Hood Test Points



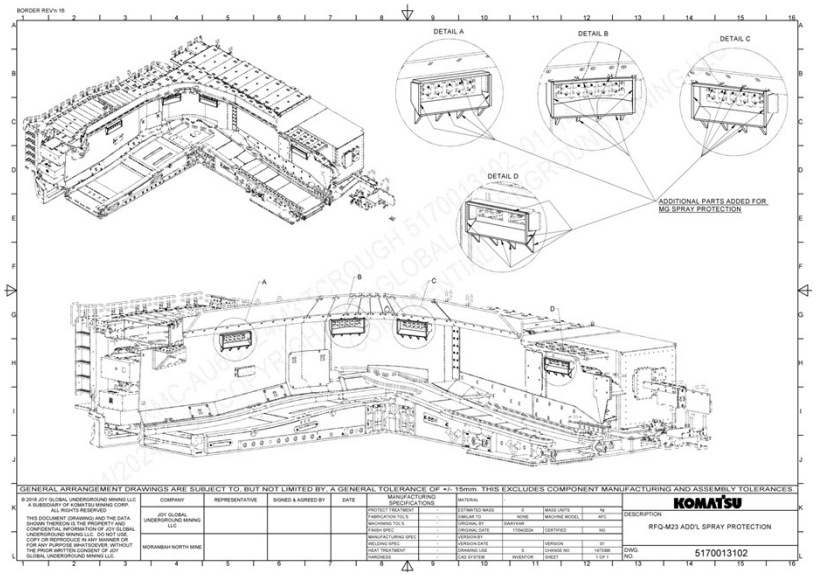
Final readings taken



Bar Chart – Discharge hood readings.

MG Corner Controls

Improved MG Turn around sprays, foam and enclosure

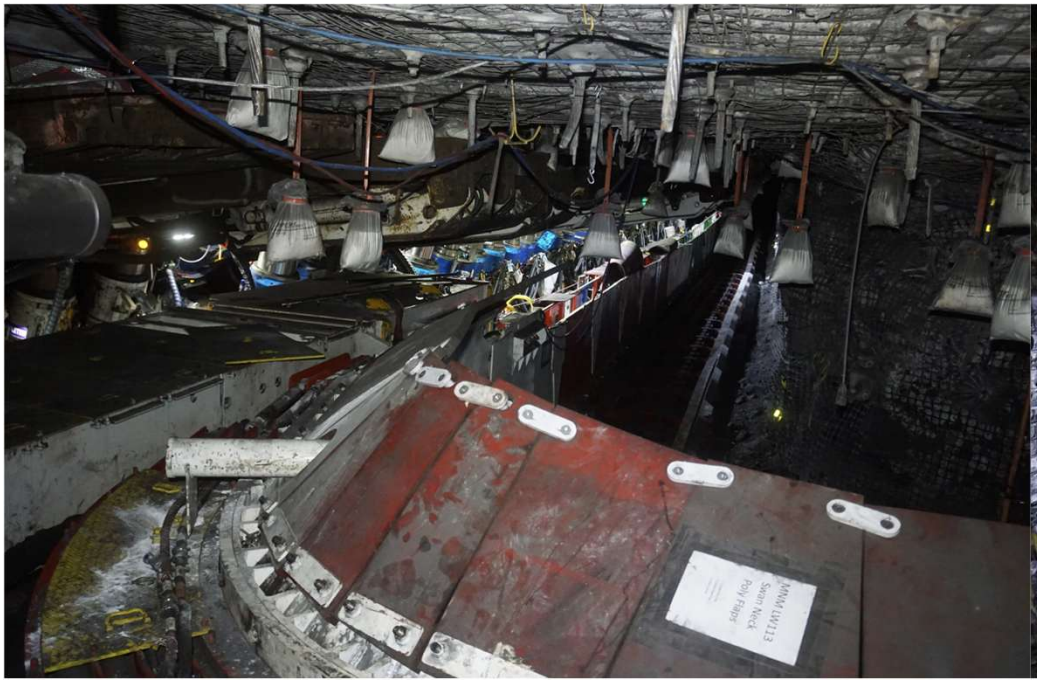


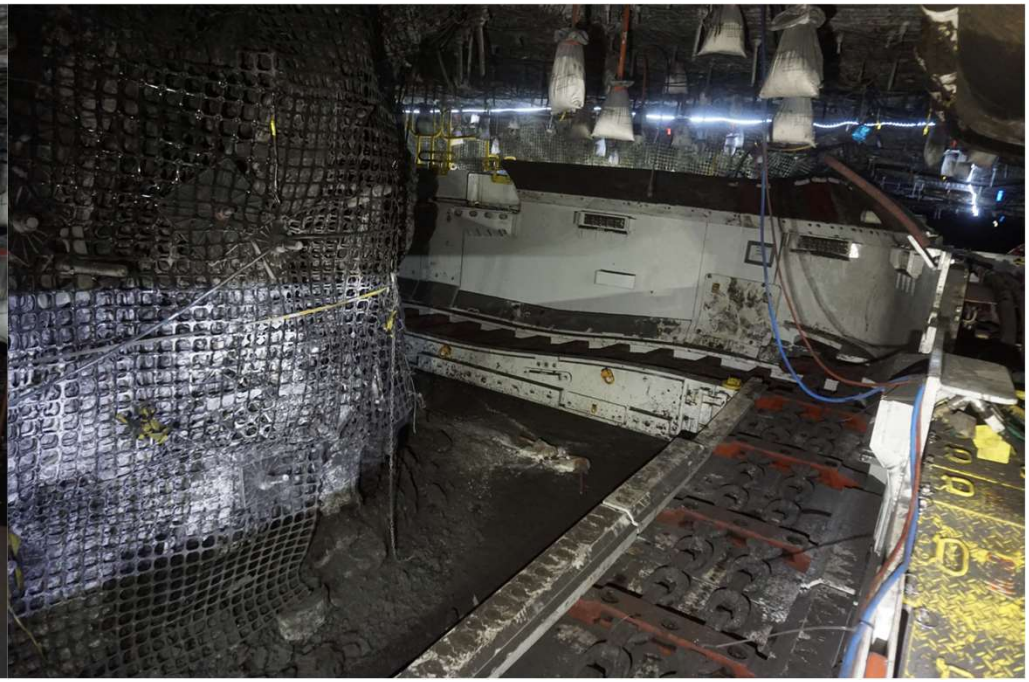
MG Corner Controls

Foam at #4 support prior to MG turnaround

MG Corner Controls

Improved MG Turn around sprays, foam and enclosure

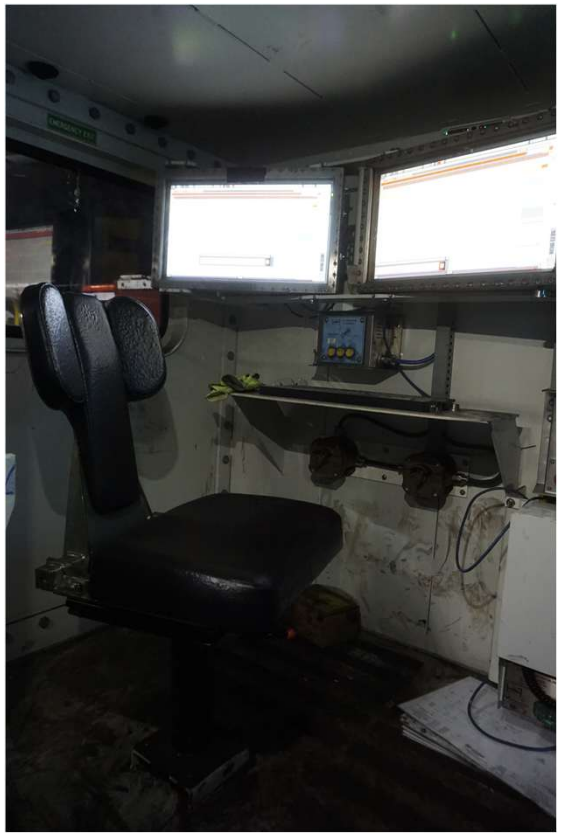


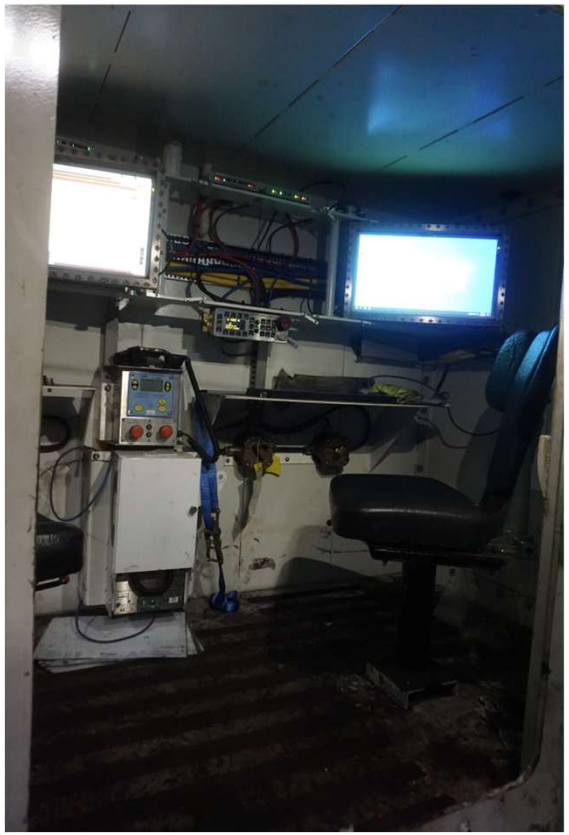


MG Corner Controls

Introduction of Face Operating Centre (FOC)

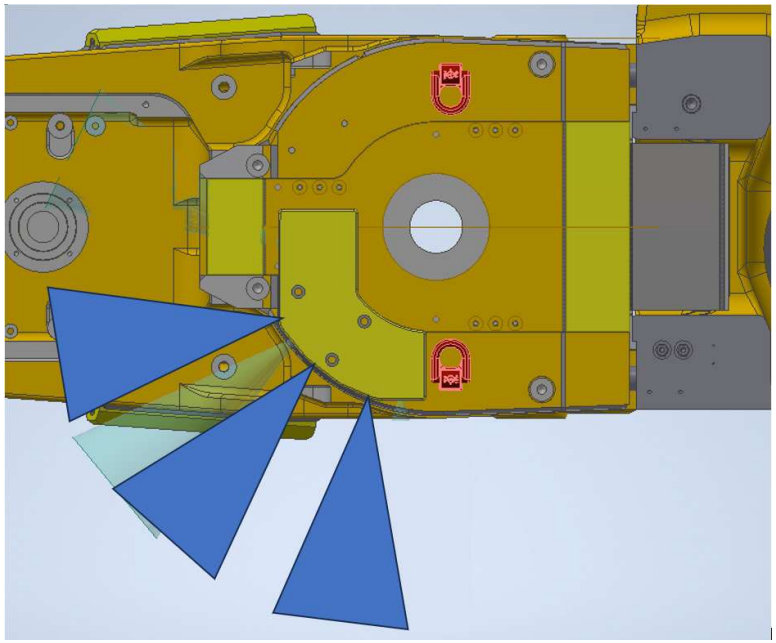
MG Corner Controls



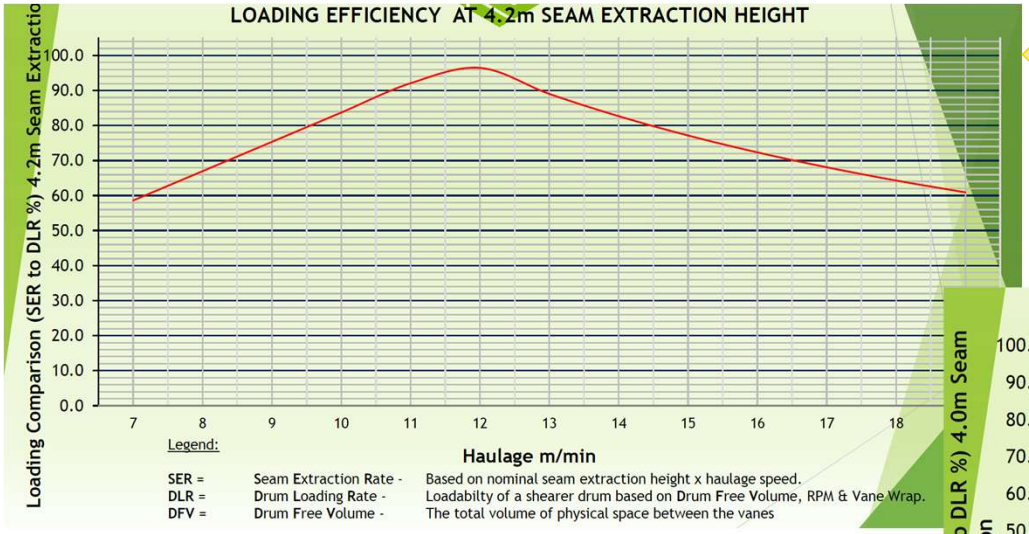


Shearer Controls

Shearer spray improvements to cowl, body, and ranging arm nose cones.

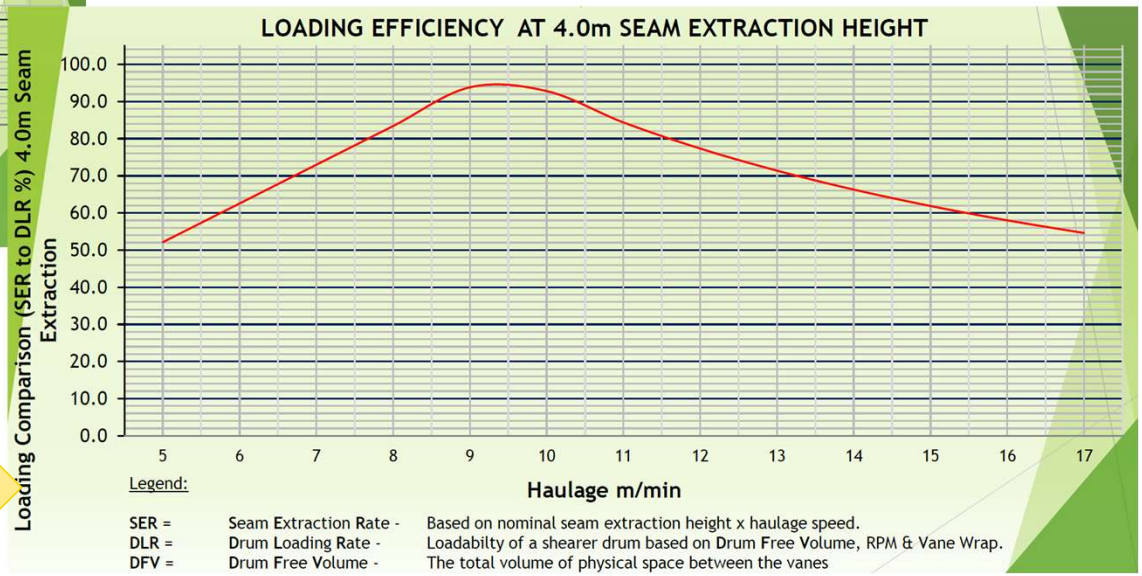


Shearer Controls



Old drum design

New drum design



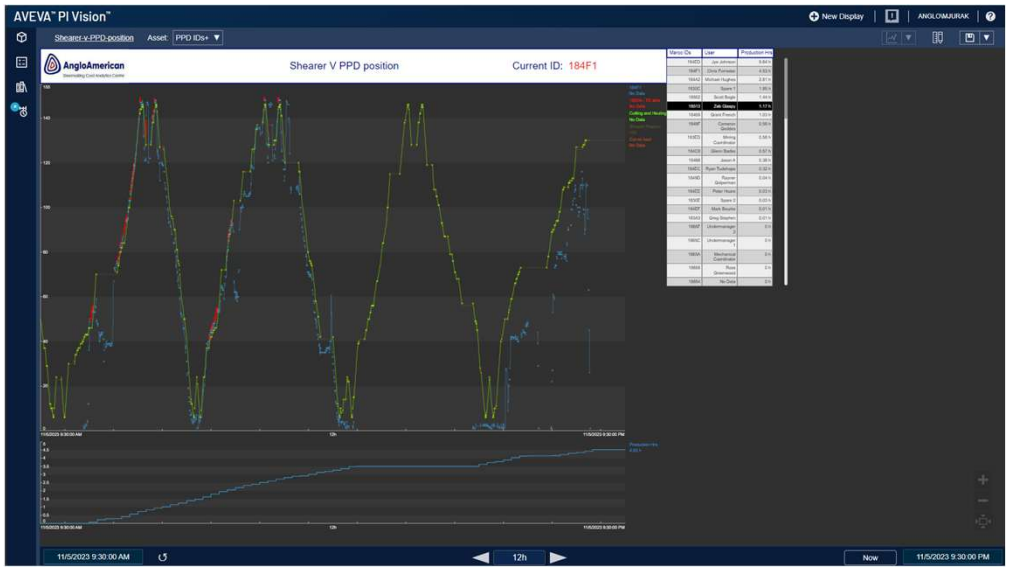
Blockage Management

Introduction of hydraulic rock splitters to better manage rock on the AFC. Inparticular smaller rocks that are too small to shotfire, but large enough to cause a blockage. Rock blockages on the AFC have been attributed to Silica exceedances on the longwall face.

Risk management, change management, training package and training on the use of these has been completed across all crews.

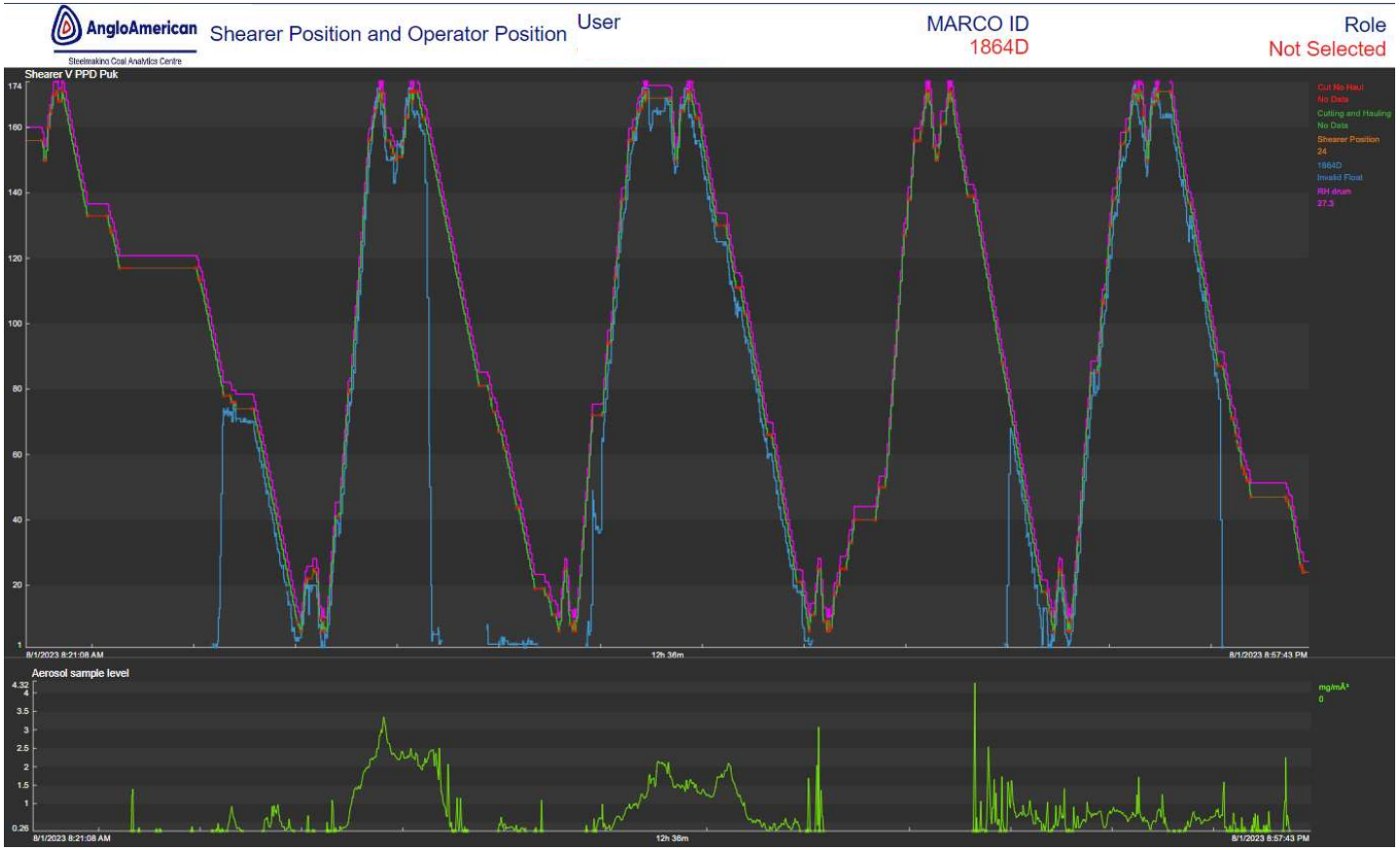
Real Time and PPD Monitoring

- To aid in the development of more effective engineering controls, to develop an appropriate job rotation strategy, and to confirm operator positioning is effective, real-time monitoring has been carried out on several shifts. This data has then been correlated with PPD data to determine what is an appropriate amount of time to spend operating roof supports or the shearer.
- A smart report has been developed and is now being made available to the crews to aid in managing time exposure at the face as well as confirming operator positioning is being adhered too.

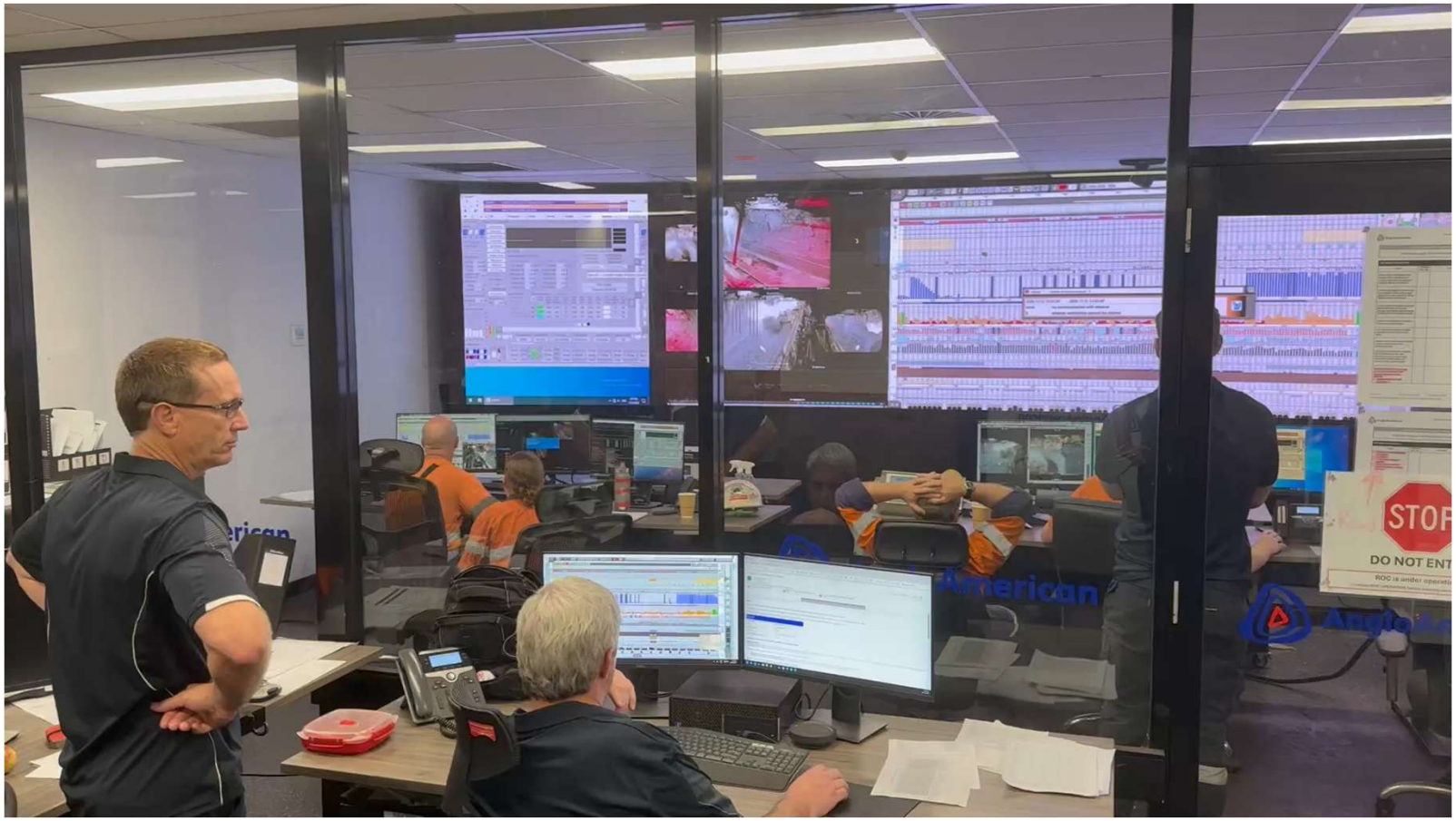


Marco ID	User	TARP Exposure Time	Total Exposure Last 12Hrs
25D95		3hrs 55mins	3hrs 55mins
25D94		3hrs 33mins	3hrs 33mins
17F08		2hrs 28mins	2hrs 28mins
18C5E		2hrs 33mins	2hrs 33mins
17EE5		2hrs 27mins	2hrs 27mins
18618		2hrs 30mins	2hrs 30mins
2E7C8		2hrs 22mins	2hrs 22mins
17EDA		2hrs 19mins	2hrs 19mins
25D64		2hrs 52mins	2hrs 52mins
2E7D9		1hrs 36mins	1hrs 36mins

Real Time and PPD Monitoring



Remote Operations



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Questions?