



# **Matla Coal – COALTECH Research**

**REALTIME DUST MONITORING ON CM's**

**METHANE MONITORING ON CM's**

**ADDITIONAL VENTILATION ENERGY AROUND CM CUTTER  
DRUM**

**Presented by A.Lenonyana**



## Overview of Exxaro: Matla Coal

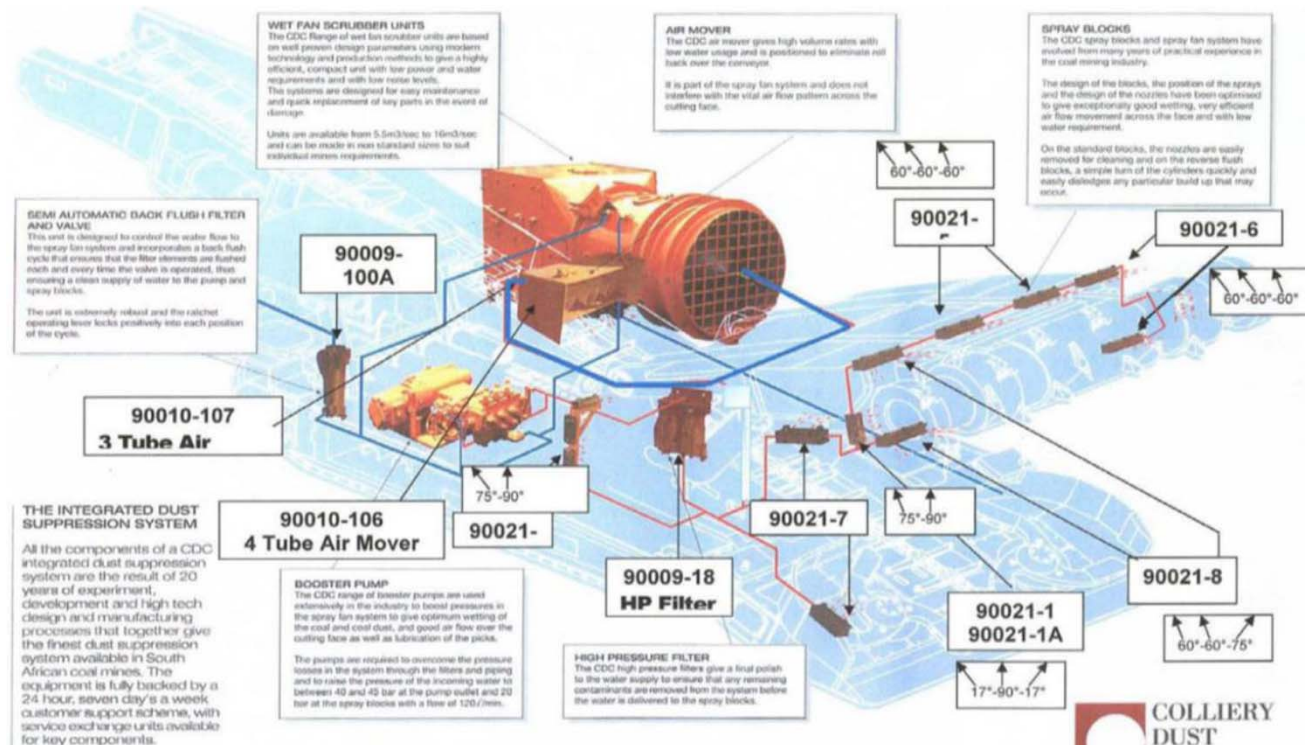
- Matla is a coal mine situated approximately 20 kilometers west from a town called Kriel and 35 kilometers north of Secunda, Matla coal is a captive colliery which supplies Matla power station .
- Matla Coal is a fully mechanized underground mine, employing continuous mining and wall mining methods with conveyor belt transportation of the coal to surface,
- Drill and blasting is limited to advancing through doleritic intrusions and floor and roof brushing for belt drives or other underground plant installations.



- Coal being a soft rock compared to platinum and gold, we use heavy machinery called Continuous Miners, CMs, to mine coal seams underground. During the mining of coal the Continuous Miners generate a lot of airborne coal dust and the release of Methane gas into the atmosphere in which employees work in.
- Being that the liberation of these pollutants in the atmosphere impacts employees badly. e.g. the course of Coal Miners' Lung disease and Methane Explosions



- Kloppersbos developed a standard for the water spray configuration on the CMs in order to control the harmful airborne coal dust and gases liberated during the cutting process.





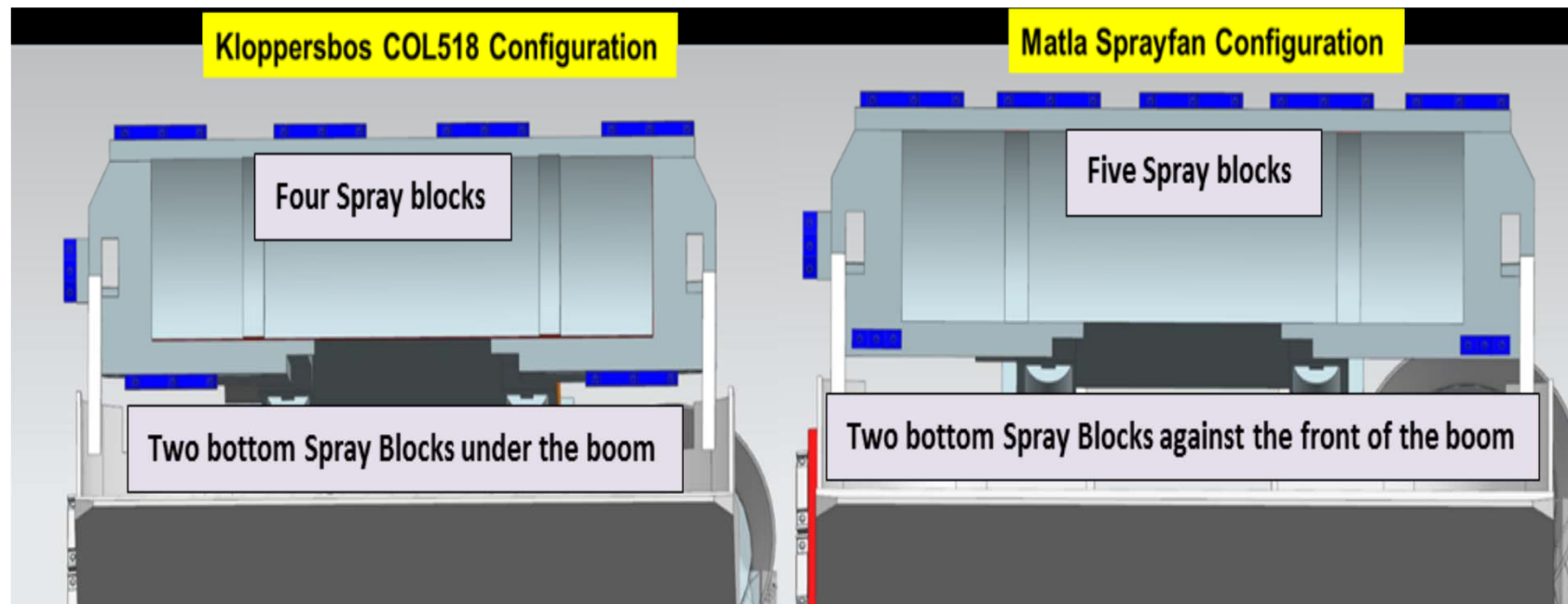
- The Kloppersbos standard required that the CM must have 34 fully functional nozzle water sprays at a predetermined water flow rate of 100l/m at a pressure ranging between 18 and 20 Bar
- But due to the increasing production demands and advanced cutting Methodologies, many mines have deferred from the Kloppersbos standard. Rendering their measurements questionable and making their designs for their individual CM's different from the Kloppersbos design.



- It was for this reason that Matla modified the Kloppersbos system and called it the “Matla Sprayfan” system to suit our unique cutting conditions underground.
- Making the Matla Sprayfan system the first ever creation in the world to use a compressor and air movers,
- Matla approached Varicon an independent consultant company to verify the value and applicability of the system against the proven Kloppersbos standard
- And also to prove that the “Matla Sprayfan” system is a more advanced and more effective in the control of the airborne dusts in the CM heading and the detection of Methane gas.



- Matla Sprayfan system uses a water pressure ranging between 35 - 40 Bar the result being to atomize water droplets so that more airflow passes the face area



## MODIFICATIONS MADE: MATLA SPRAYFAN SYSTEM

- INCLUDES

1. 2<sup>nd</sup> Methane Sensor





- Installed on the left hand side, closer to the cutting boom position in an attempt to measure and monitor the methane levels underneath the cutting boom more effectively
- Because from research it was shown that free methane generated during cutting processes, tends to accumulate underneath the cutting drum



## AIR MOVERS

- The use of mini-air movers to enhance the energy around the cutting head. Removal of methane and dust under the cutter drum and the face.



## REAL TIME DUST MONITORING

Real dust monitor is installed on the return side of the CM to adequately measure how much dust the CM is liberating during cutting.





## ADVANTAGES AND EXPECTATIONS

- Dust results will be obtained at the control room from a software that is linked to the Real time dust monitor installed on the CM, unlike the normal traditional process of taking samples to a lab for analysis of the sample taken
- Additional water sprays guarantee more dust suppression and more airflow circulation in the CM section through the compressor installed on the CM to power the air movers.
- Early detection of high methane readings.



## PURPOSE OF RESEARCH

- To eliminate Methane ignitions and or Methane explosions
- To effectively monitor and control dust around the CM whilst cutting



## TIMELINES FOR TRIALS

- The trials for the Matla Sprayfan resumed on the 17<sup>th</sup> of March 2017 to date
- Data is collected by our usual Gravimetric dust sampler as it has been a bit of a challenge to link the Real Time Dust Monitor to the software installed in the control room.
- From the data collected we have seen a significant improvement in our dust results which range between a minimum concentration of 0.2 mg/m<sup>3</sup> and a maximum of 3.80 mg/m<sup>3</sup> which can be attributed to factors such as cutting through shale stone or water supply to the CM itself.
- No alarming concentrations of methane have been detected in the sections where the Matla sprayfan CM is deployed.



## CLOSURE AND FUTURE INFORMATION SHARING

- For evaluating CM heading ventilation using CFD models and optimizing CM methane monitoring summary and more detail about the Matla Sprayfan, contact Mr Cor Meyer.
- Matla would like to thank Mr CF Meyer for the research and investigations on the CM headings and for continuing to be hands on with the CM.

Thank You!!!!!!