



Mine Ventilation Society of South Africa

2017 Conference

Advancing the Technology of Methane Monitoring on a Continuous Miner

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Expectations from the Project:-

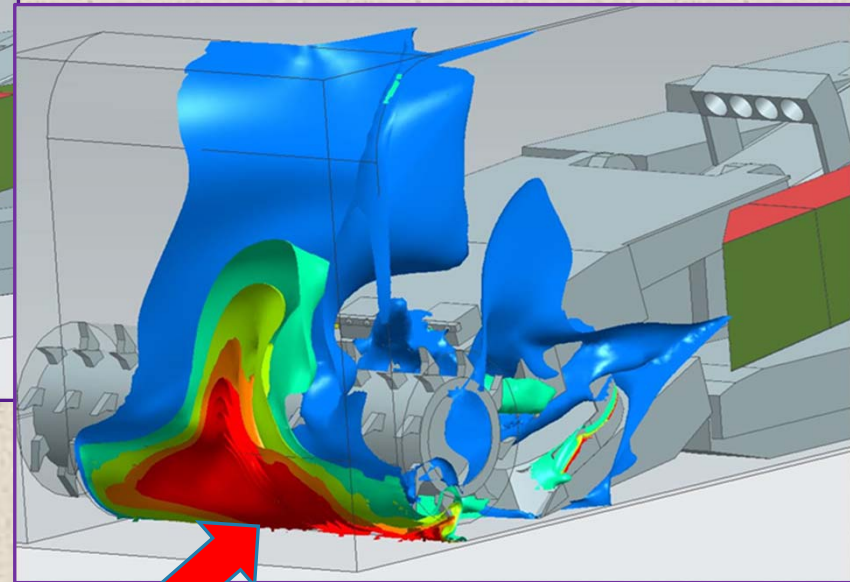
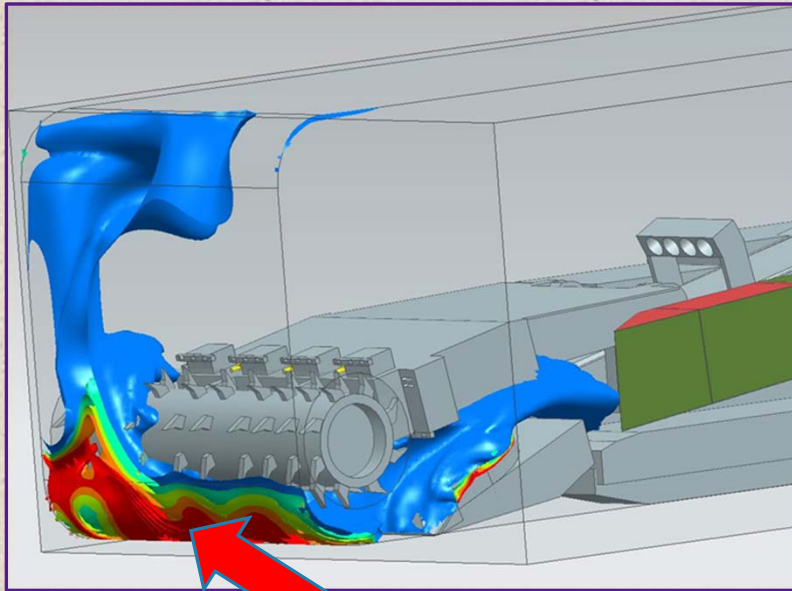
- 1) Prove the value and practicality of the second sensor**
- 2) Find the optimum position for the second sensor – where do we expect the highest methane concentrations**
- 3) Real-Time Methane Data Logging – can it be done effectively, accurately and can the data be conveyed to a surface computer?**



Previous Learnings

Methane gets trapped underneath the cutting drum

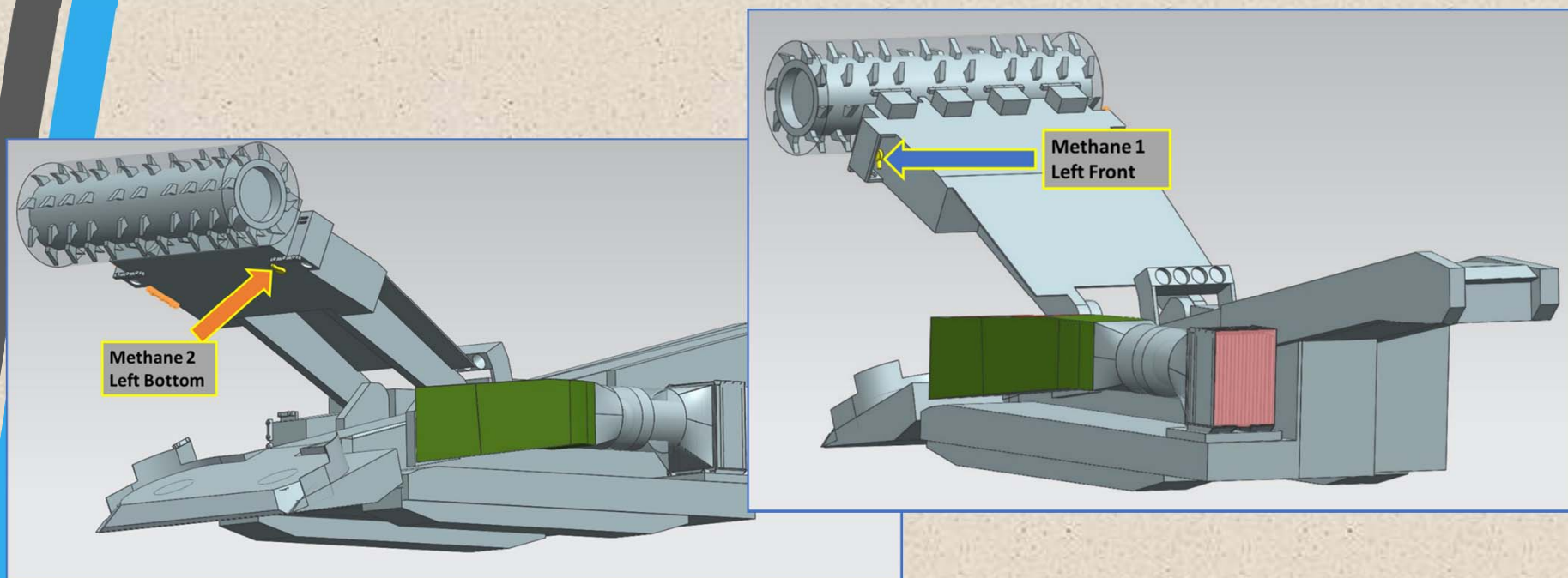
- CFD shows that the methane tend to accumulate under the drum hence increasing the risk of ignitions.



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Previous Learnings

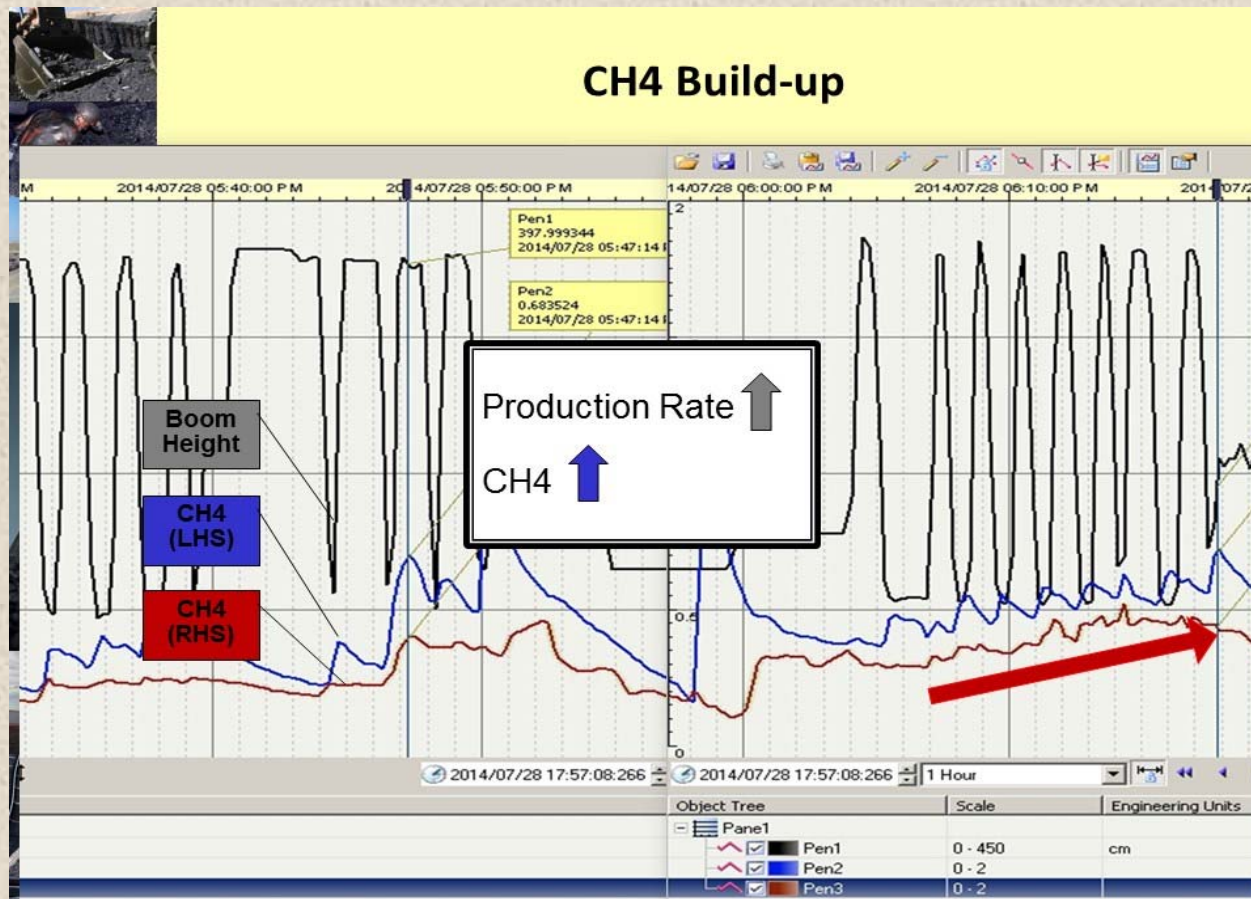
Methane sensors needs to be closer to the cutting area underneath the cutting drum



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Previous Learnings

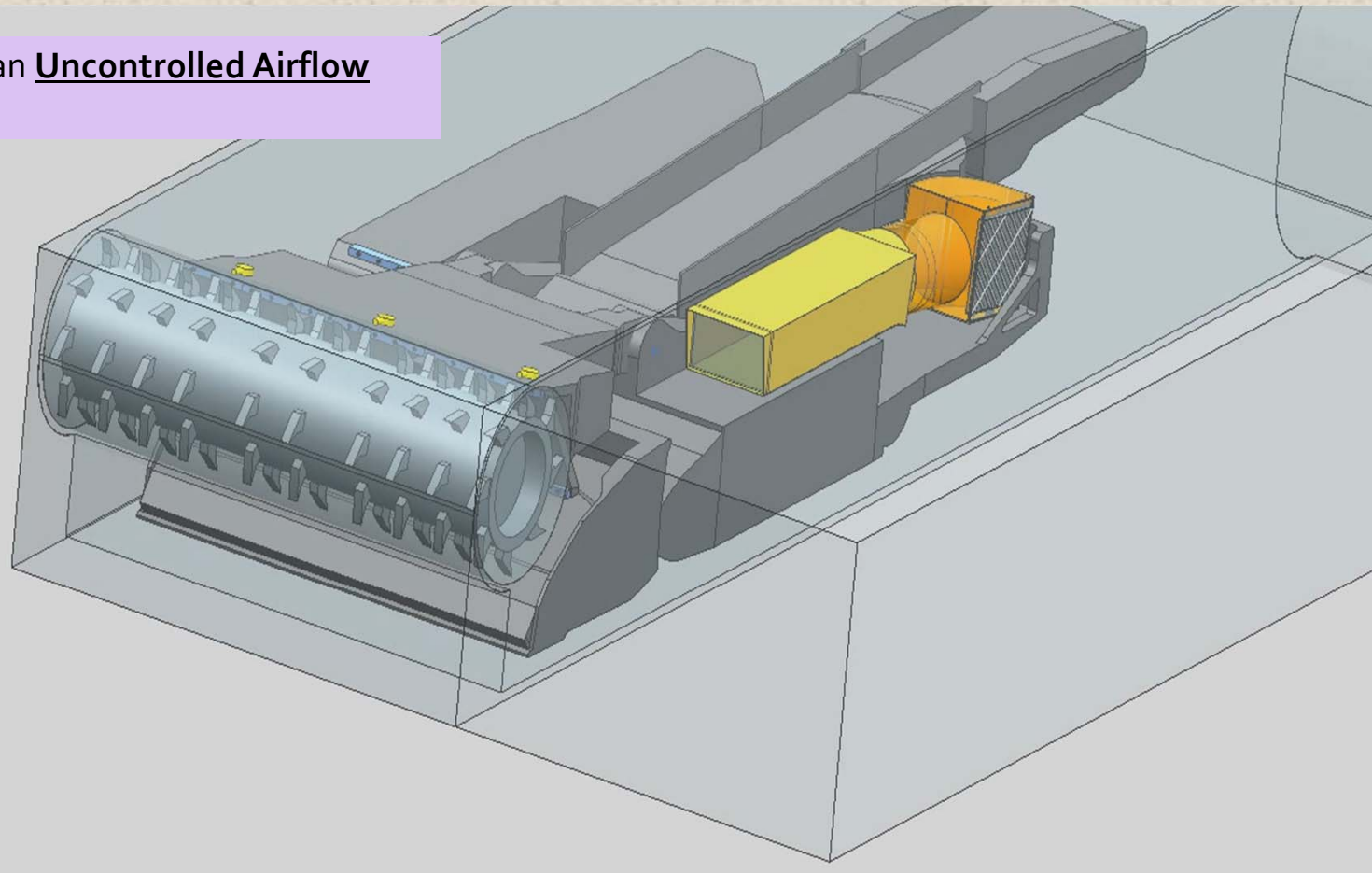
Methane data logging is already used extensively at various operations – but Real-Time Logging and storage of data still has to be fine tuned



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Through CFD we have learned much on the effect of different airflow currents on Methane Behaviour

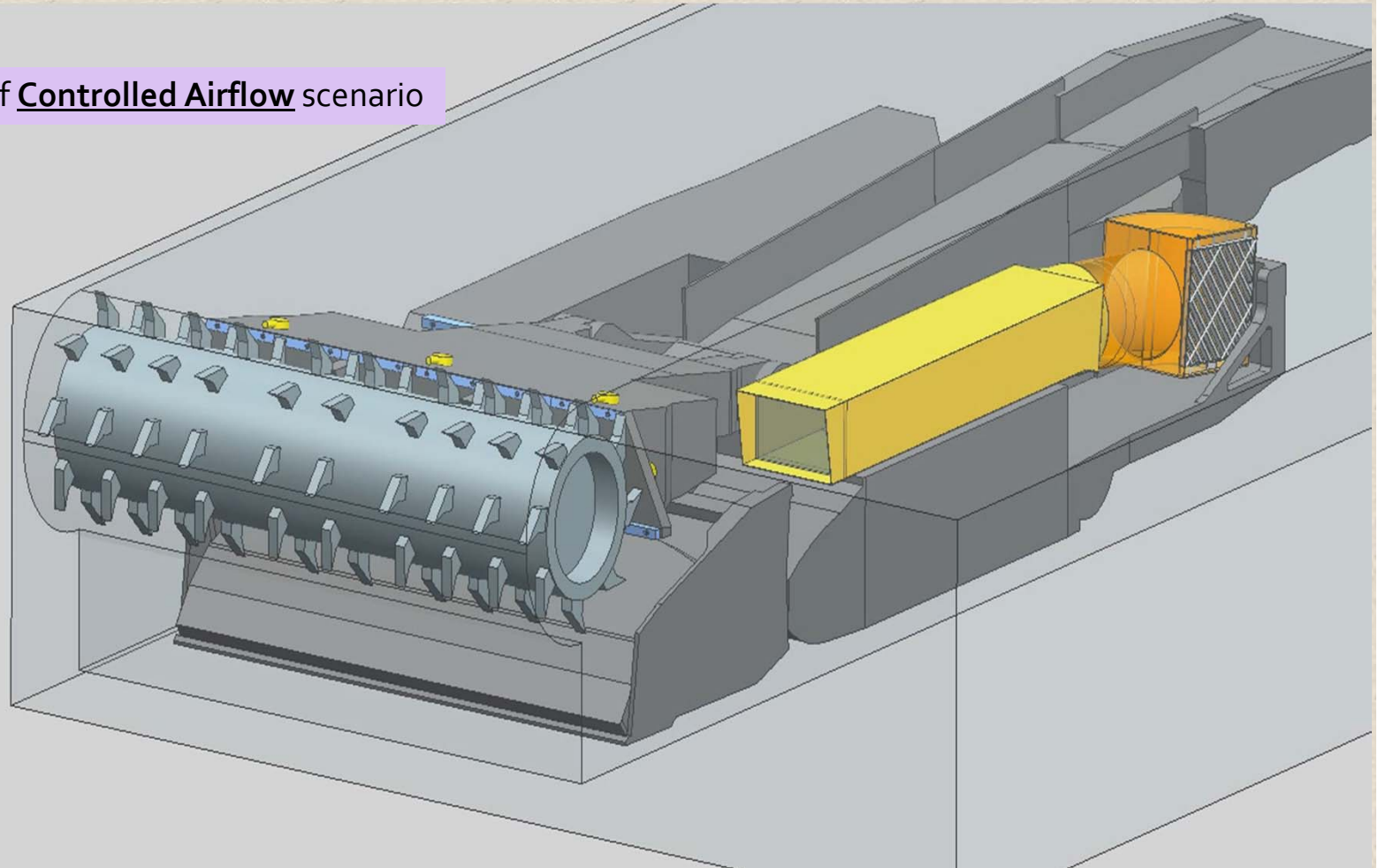
Demonstration of an Uncontrolled Airflow scenario



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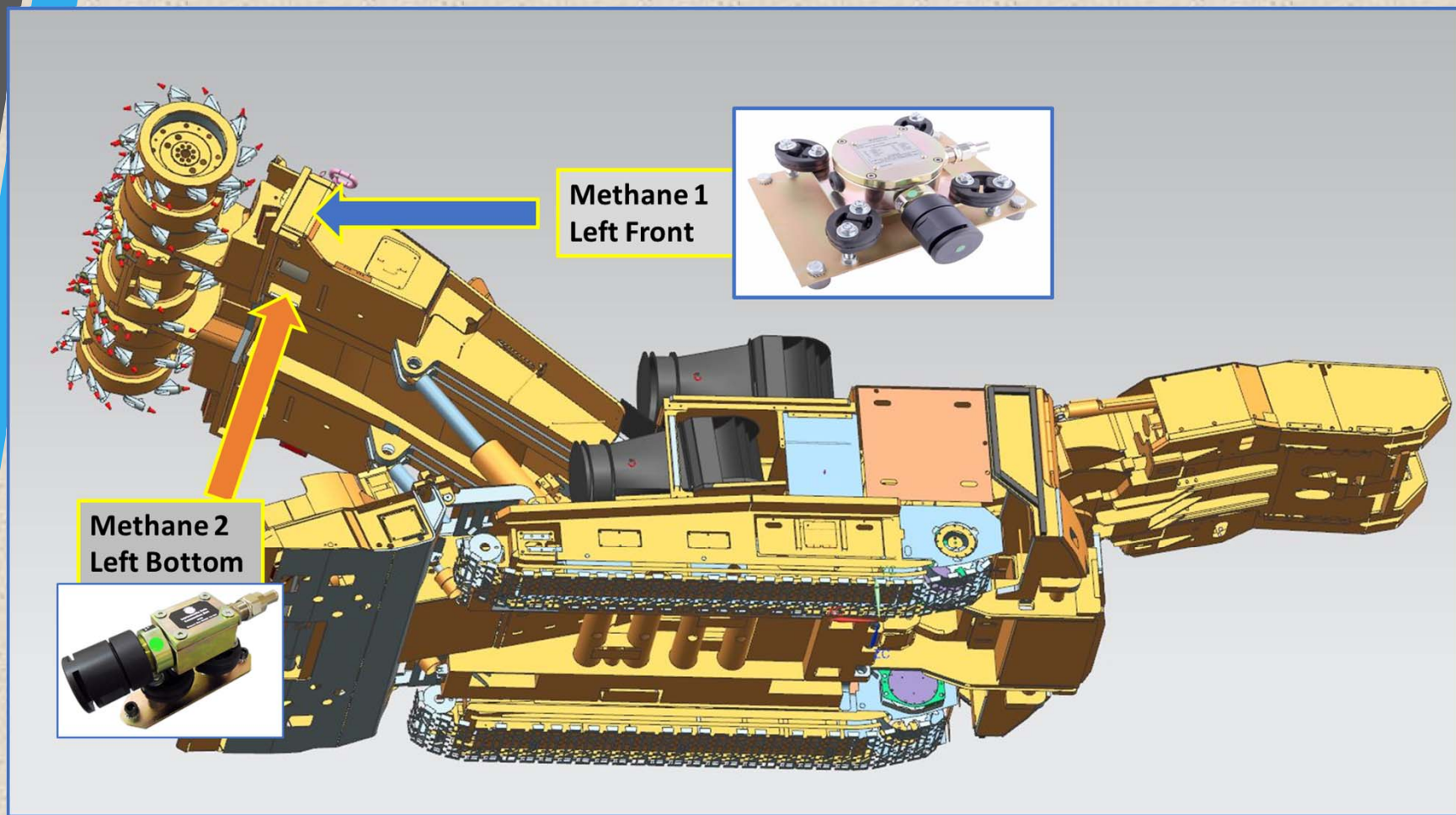
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Demonstration of Controlled Airflow scenario



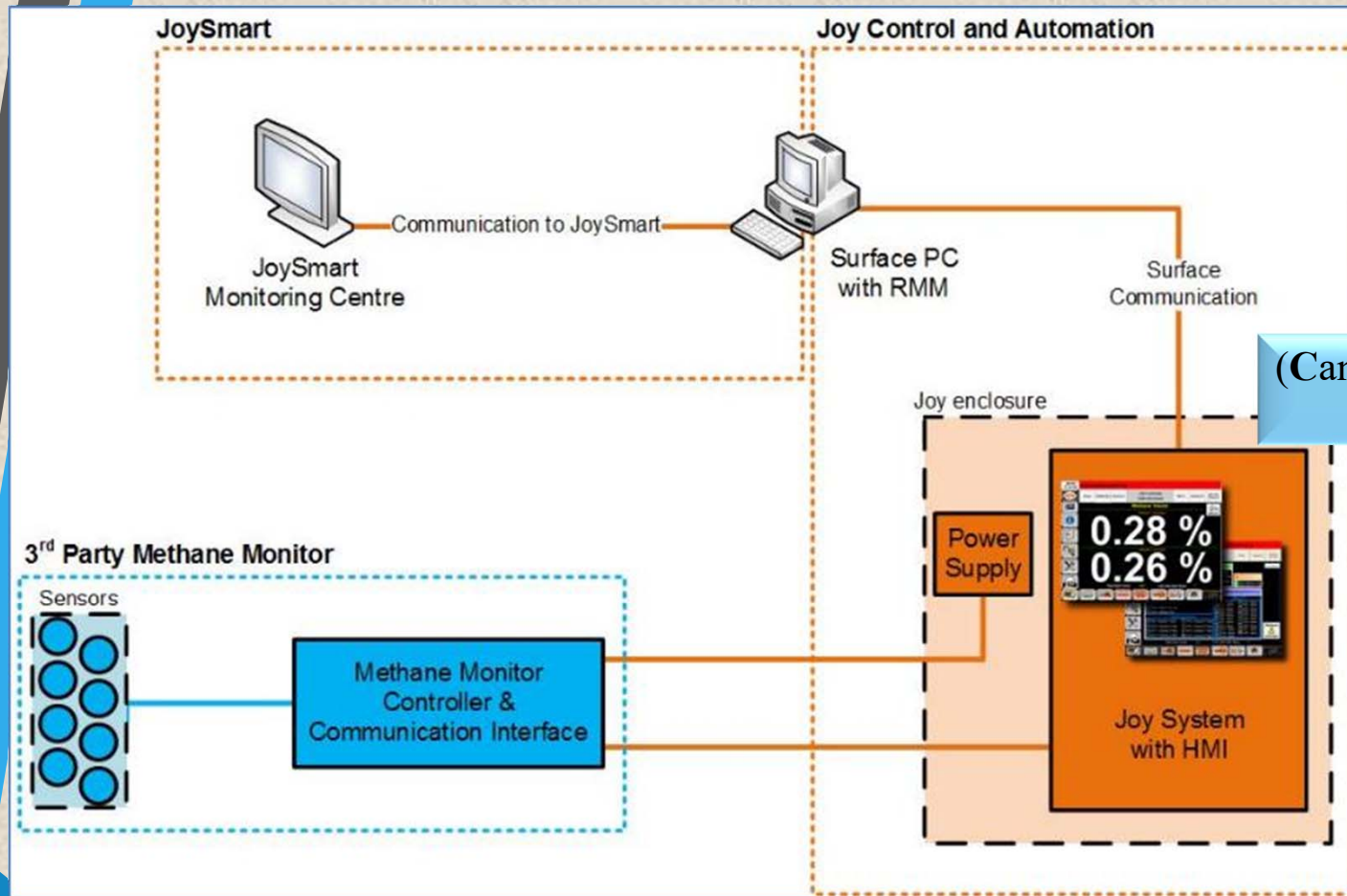
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Taking the Theory Underground for In-Situ Verification



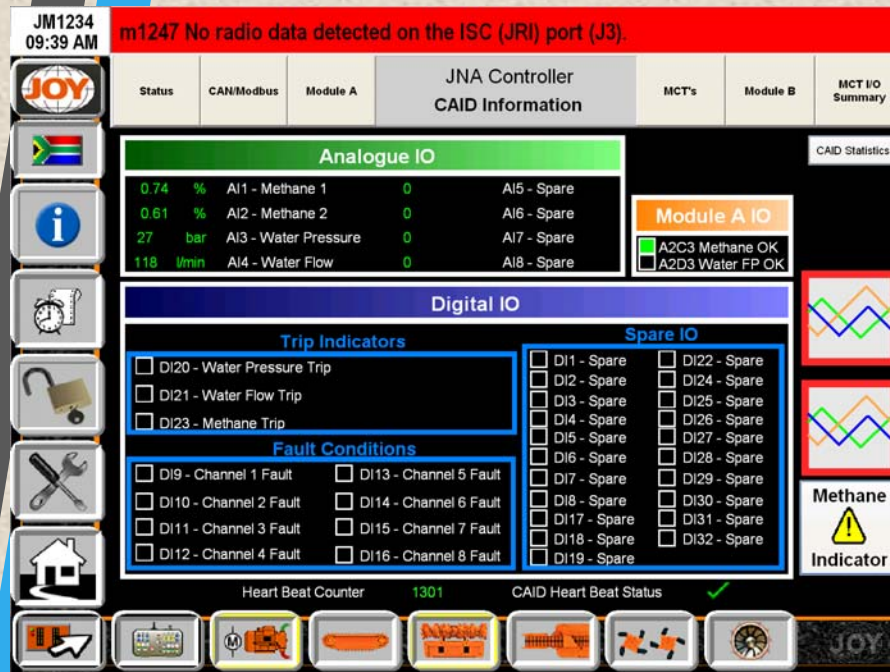
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Real-Time Data Recorded, Downloaded and stored on the CM



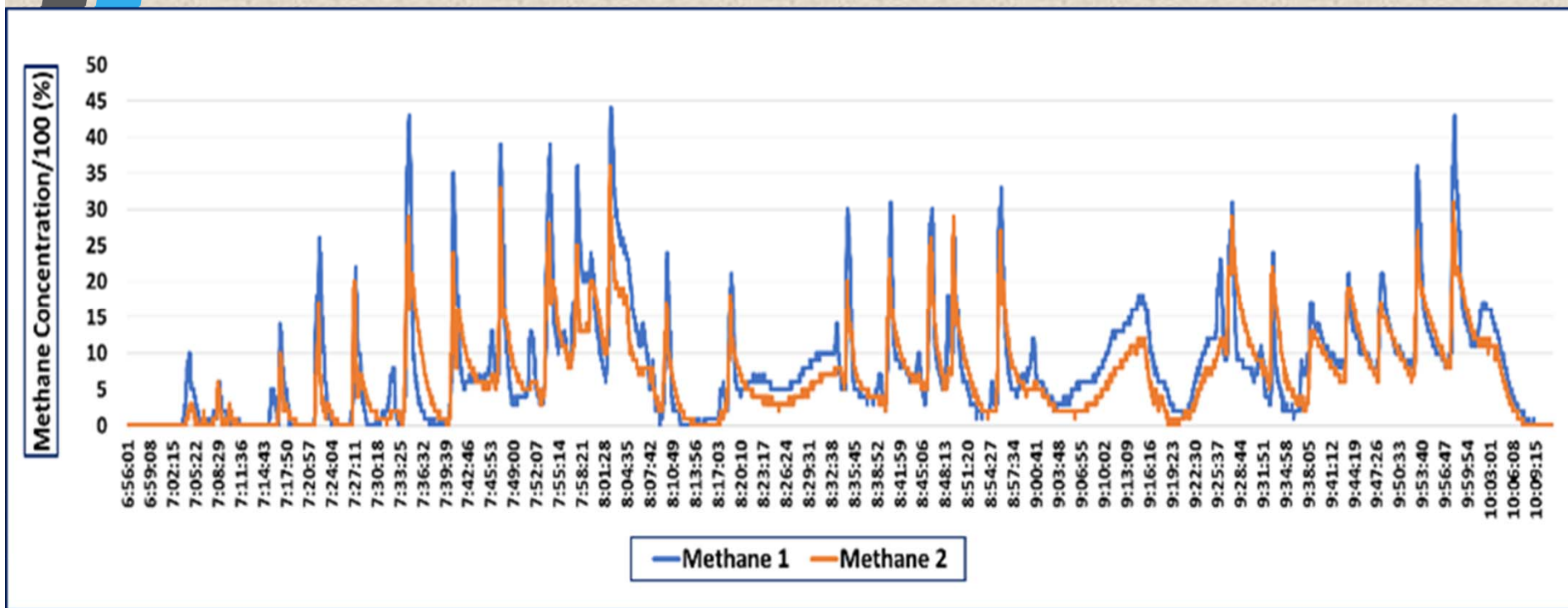
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Real-Time Data Recorded, Stored, Downloaded and Displayed on a Surface Monitor



Real-Time Data was Recorded from December 2016 to April 2017

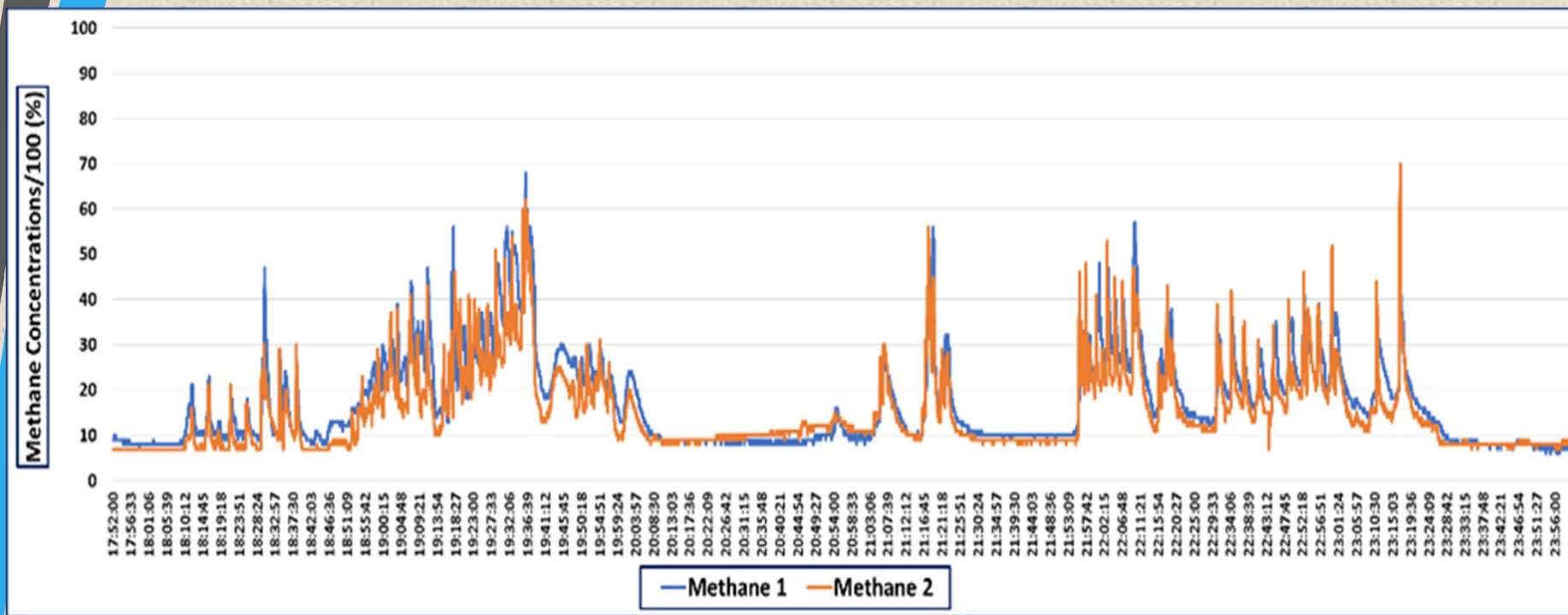
Examples of the Recorded Data



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Real-Time Data was Recorded from December 2016 to April 2017

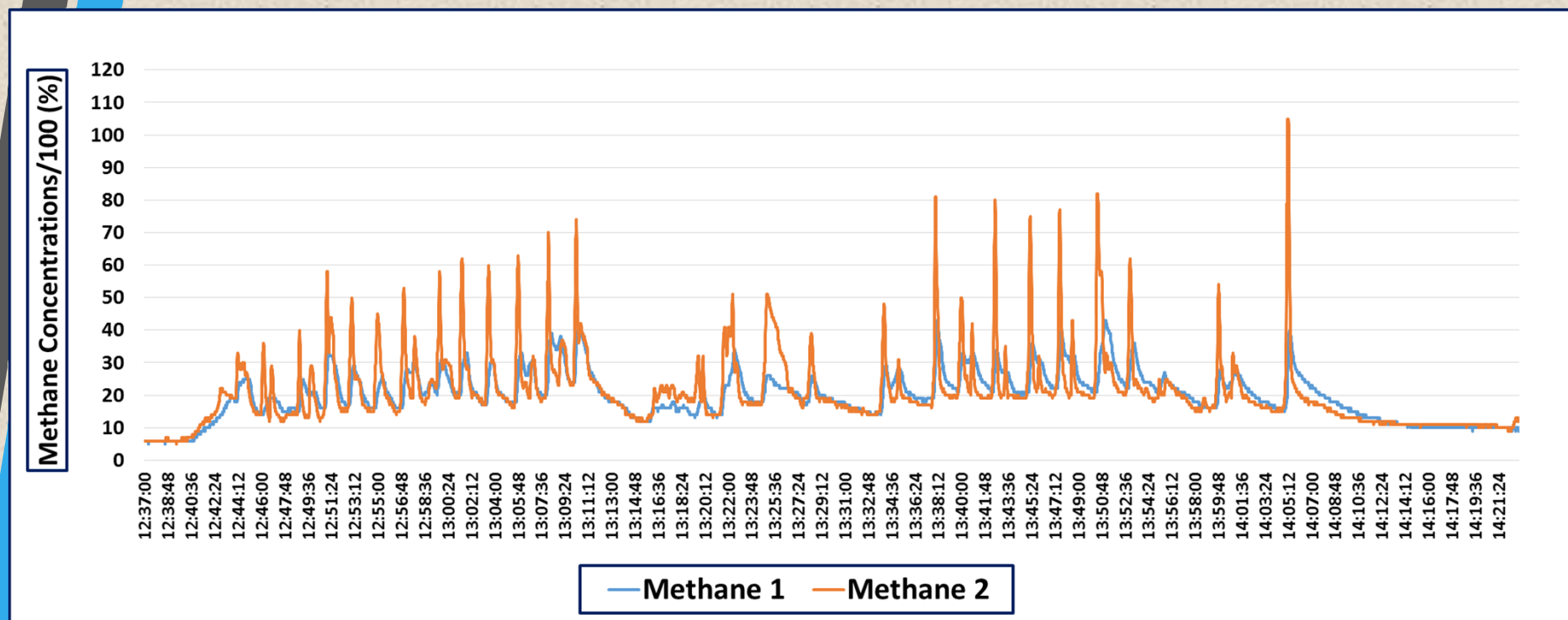
Examples of the Recorded Data



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Real-Time Data was Recorded from December 2016 to April 2017

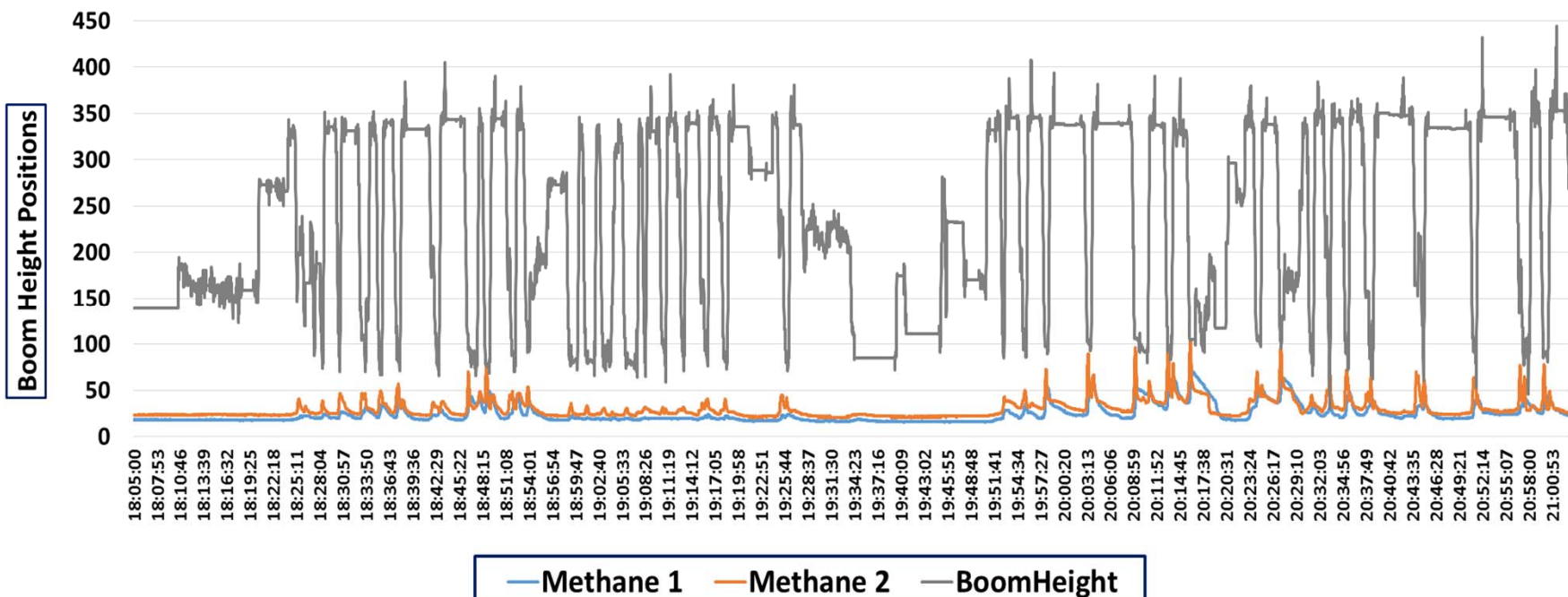
Examples of the Recorded Data



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Real-Time Data was Recorded from December 2016 to April 2017

Effect of the Boom Position on the Methane Data

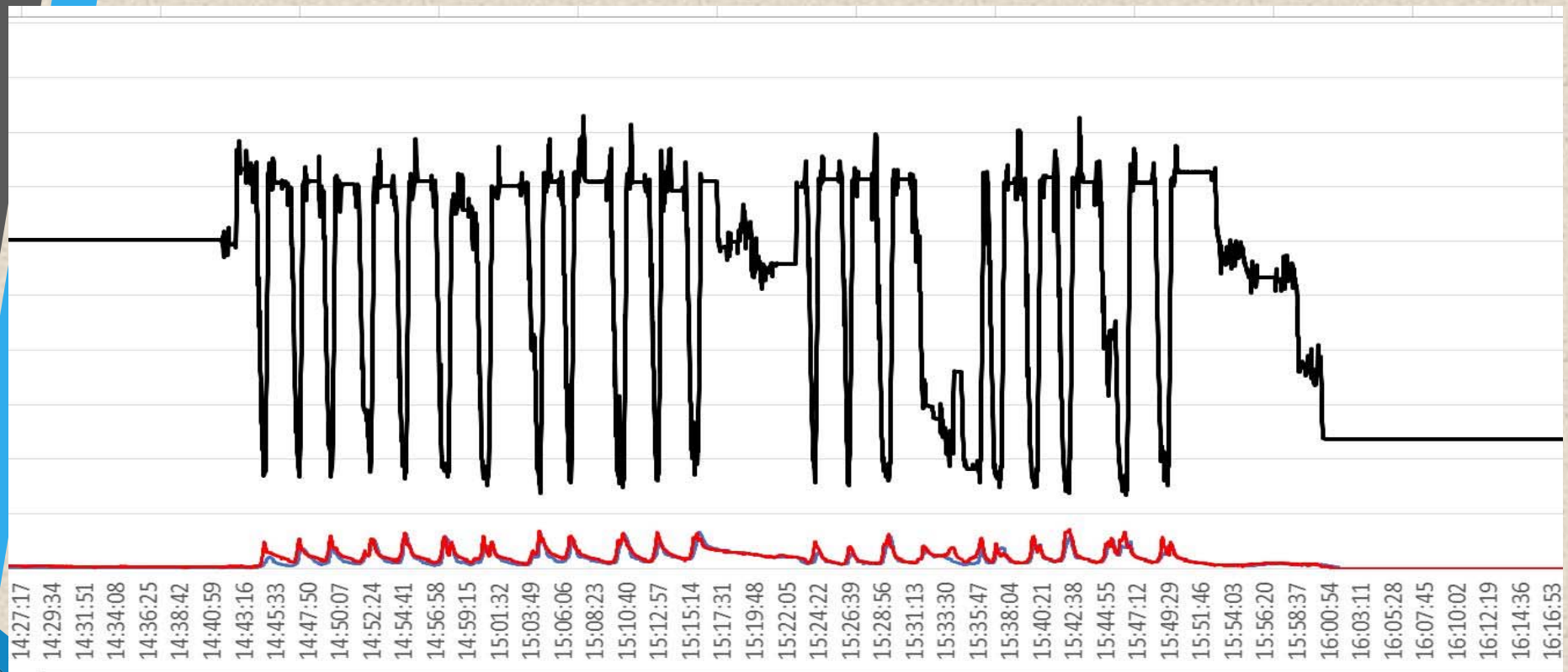


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Real-Time Data was Recorded from December 2016 to April 2017

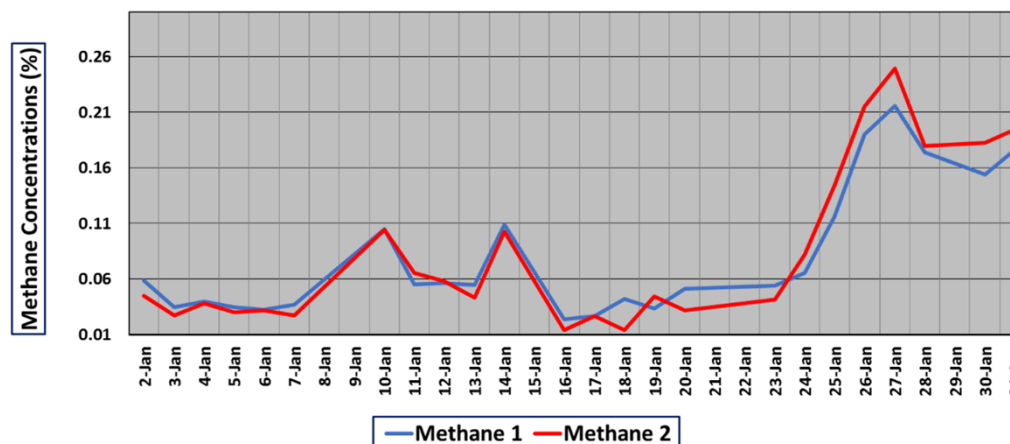
Effect of the Boom Position on the Methane Data



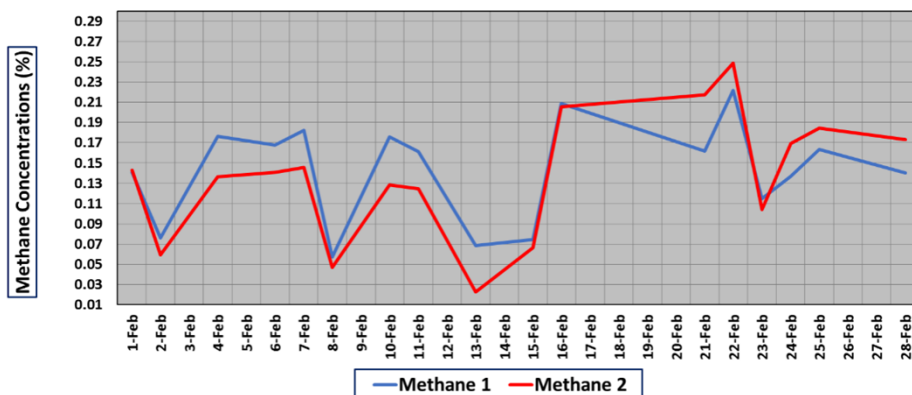
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Comparing the Data from the two Sensor Positions.

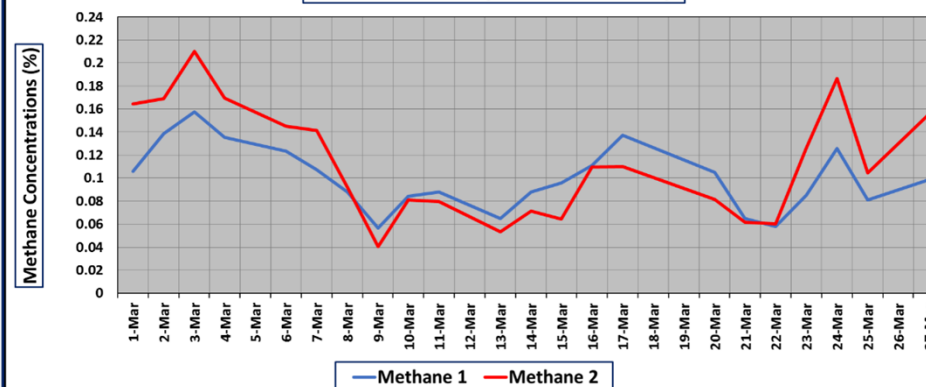
January 2017- Average Methane Readings



February 2017- Average Methane Readings

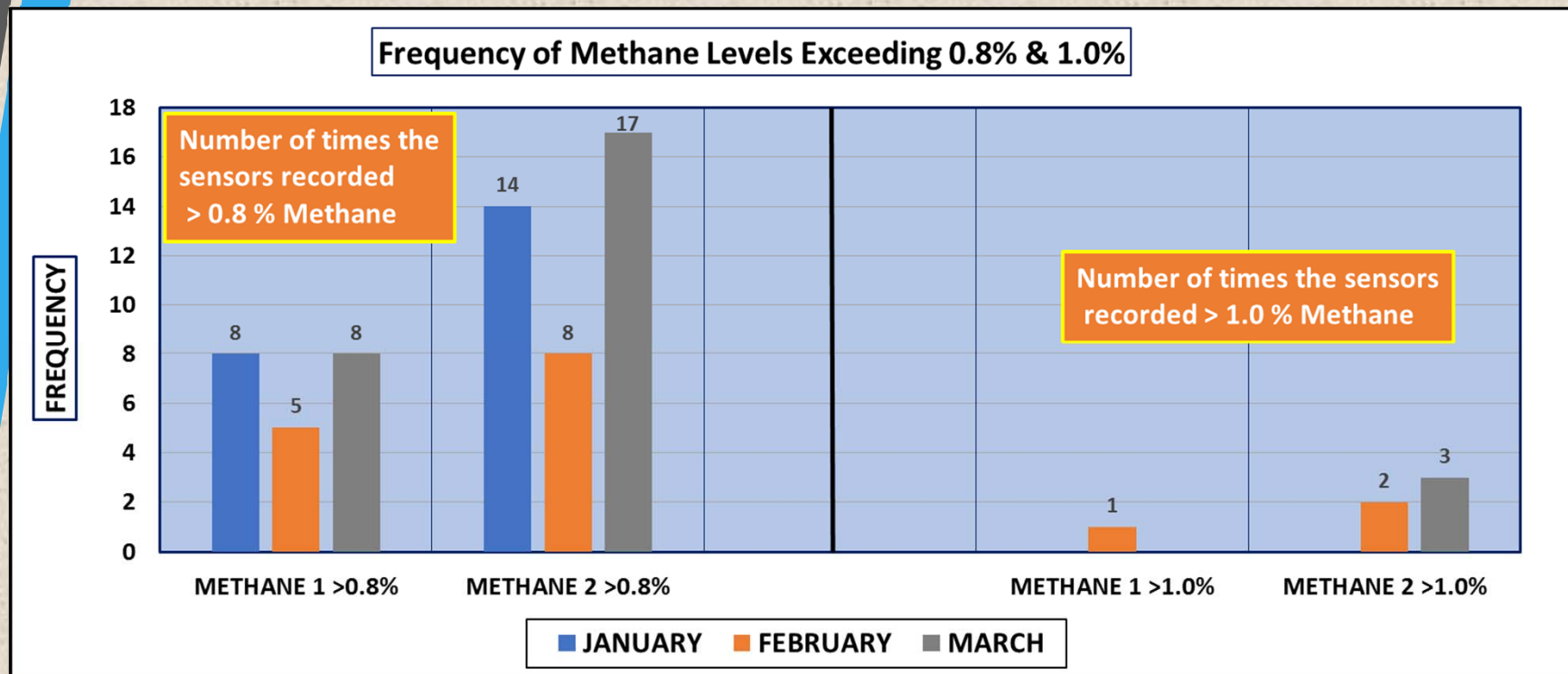


March 2017 - Average Methane Readings



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Comparing the Data from the two Sensor Positions.



Learnings & Achievements

1. The second sensor adds significant value and should be part of the Methane Monitoring Strategy
2. Practical? – 12HM37 provides sufficient space for the second sensor. Each different CM model will have a different second sensor position
3. Real-Time Methane Data Logging is possible and should be a standard for all CM sections

Challenges for the Industry

1. Regular cleaning and calibration of all sensors involved
2. Which sensor will be used to interrupt the current to the drum?
3. Who should have access to the information and what protocol should be followed when excess Methane levels are noticed?



THANK YOU

Q & A



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