Using Machine Learning in Cement plants – how to predict failures before they occur

Michael Tay
Product Manager
Rockwell Automation

Celso Axelrud
Tech Consultant
Rockwell Automation

Machine learning (ML) is the use of adaptive algorithms to give systems the ability to learn through data without explicit coding. Many techniques are leveraged today in cement and other similar industries. Predictive maintenance forecasts when major equipment or systems will fail. Anomaly detection, uses learned normal patterns from multiple measurements for early detection when something is wrong. Predictive KPIs forecast results and estimate what is causing poor performance. Model Predictive Control, like the above, is machine learning toward coordinating and stabilizing processing at maximum performance levels safely within equipment limits. Cement has significant experience with Expert Systems rule-based applications. Decision trees one form of ML offers a new way to learn rules rapidly and automatically. The goal is rapid, semi-automated development of profitable applications as near to ‘click’ as possible that achieve and sustain targeted results.

Note qualifying adjectives above. The cement industry knows things that seem easy will have challenges in execution. We will describe how advanced process control techniques have evolved from a focus on process optimization to new applications such as predictive maintenance with broader machine learning tools.