

ON THE DEVELOPMENT OF A SMART SYSTEM FOR THE CONTROL OF A CEMENT BALL MILL**M. Macedo Pulido, K. Generali, L. Lanchas Fuentes, M. Sofianos, N. Pistofidis*, Em. Haniotakis**

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(**n.pistofidis@titacement.com*)**ABSTRACT**

The cement ball mill is one of the most critical productive groups in a cement plant, as it strongly contributes to the quality of the final product. Moreover, it is responsible for a significant part of the cement production cost, especially after the recent rise in electricity costs ^[1]. Consequently, the optimization of its performance is of paramount importance.

A very effective tool for this purpose is the application of Advanced Process Control (APC) systems based on Deep Learning algorithms ^[2]. These systems do not replace the basic automation, such as interlocks or PID controllers. They allow the accurate prediction of the critical parameters which constrain the mill operation and based on these predictions they select the optimum values of the mill control variables, such as the fresh feed and the separator speed.

In the present paper a similar intelligent system is presented, which was developed based on advanced analysis of the historical data of mill operation. It is characterized by strong adaptability and robustness. With its application, the throughput of the mill was increased by about 5 to 10% with a respective reduction of the electrical consumption per ton of cement. Furthermore, the quality of the final product was more stable, while the overall operation of the mill was smoother.

KEYWORDS: Cement, Artificial Intelligence, Ball Mill, Grinding**REFERENCES**

- [1] Alsop P. A. (2014). The cement plant operations handbook, Tradeship Publications Ltd.
- [2] Walther T. (2018). Digital Transformation of the Global Cement Industry, IEEE-IAS/PCA Cement Industry Conference.