



A Practical Investigation of Production Performance at the Gohar Zamin Iron Ore Complex (Sirjan, Iran) Using Mean- and Target-oriented Monitoring

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Abstract— Among the various scientific methods for the industrial process monitoring, statistical approaches for the ease of perception as well as application, analysis and interpretation are particularly important. These approaches consider different methods for engineers in terms of process monitoring and control; however, the proper method should be based on the process. Among the various statistical process control methods, the control chart methods have been highly accepted by the industry. By adjusting the visual monitoring results, these methods easily provide the opportunity to detect the conditions out of or undergoing process control and, as a result, enable the process engineer to adopt and apply the best control decisions while determining and distinguishing special and common causes. In this paper, the production efficiency of the Gohar Zamin Iron Ore Complex (Sirjan, Iran) was analyzed using Individual-Moving Range and CUSUM control charts in 2018. Throughput to the plant No. 1 and tonnage of concentrate were considered as process responses. Analysis of control charts showed that plant capacity could be increased by up to 50 t/h by adopting appropriate decisions.

I. INTRODUCTION

Undoubtedly, no industrial process can be found that consistently follow the ideal conditions during its lifetime. In

the mineral processing industry, like other industries, numerous factors such as changes in quality and characteristics of input feed, changes in production strategy, equipment burnout, changes in market tastes and requirements of customers for purchasing, socio-political changes, promotion of environmental do's and don'ts and many other parameters always vary the production process and move toward instability from the ideal case. Therefore, the continuous, accurate and scientific monitoring of various aspects of the process is the first and most basic step in order to make right and proper decisions for process control and maintaining the quality of products or final products [1-4].

A process is simply a series of actions or operations conducting to achieve a particular result. In advanced view, a process is defined as a sequence of interdependent and linked procedures which, at every stage, consume one or more resources (employee time, energy, machines, money) to convert inputs (data, material, parts, etc.) into outputs. These outputs then serve as inputs for the next stage until a known goal or end result is reached. Preliminarily, the main target of every process owners is to present an output with quality defined by customers or in standards. Quality is defined simply as achieving the requirements dictated by customers.