

## **Design of Complex Automation System for Efficient Control of Technological Processes of Industry**

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### **Abstract**

Modern control methods are suitable for increasing production capabilities of industrial enterprises by employing information technologies, which are often used for modernization of technological processes without the need of acquiring new equipment. Therefore, automation of the industrial processes is one of the most important directions of the technological progress, as it leads to improvement and modernization. A technological process of metallurgical production includes a number of stages, which require automatic regulation of many parameters with a high degree of precision.

Proliferation of new and upgrade of existing industrial technologies is impossible without the development of efficient systems and algorithms of automatic control of technological processes that rely on modern monitoring approaches. Typically, the monitoring tools, which include various sensors and other devices, have to be tightly integrated with automatic control systems of industrial processes to reduce service expenses and downtime, increase capacity and optimize production as a whole. While designing technological and automation lines, it is necessary to carefully select parameters to be monitored such that optimal operation is achieved. At the same time, every step of industrial production has to be monitored to assure that each particular process is properly executed and resources are utilized in an efficient manner.

Measurement technologies play an important role in synthesizing modern automatic regulation systems for individual technological parameters and processes, and also for designing automatic control systems for the entire technological process. The latter requires massive amounts of sensory data generated in a convenient form for collection, conditioning, subsequent processing and transmission to higher-level modules in hierarchical control structures. In this work, we propose a unified concept of application of modern means of automation that can be used to build a three-level hierarchical control system intended for assuring the product quality.