

THE MONITORING SYSTEM FOR GUIDING A PIT LIFTING VESSEL IN THE SG-1 SHAFT OF KGHM O/ZG “POLKOWICE – SIEROSZOWICE”

Abstract

The paper deals with the description of a technical solution that has been developed by TEMIX company and represents a subsequent stage on perfecting and further improvement of a well-known appliance for measurements of forces in carrying ropes of hoisting machines in mining shafts. Consequently, a system for remote monitoring of guiding accuracy of a lifting vessel in the shaft SG-1 was designed and is currently being put into operation in KGHM O/ZG Polkowice – Sieroszowice.

Major components of the solution include a radio communication channel for data transmission between the lifting vessel and the pit bank, a specialized microprocessor controller installed on board of the lifting vessel and equipped with relevant measuring instruments and sensors as well as system for power supplying of the entire hardware. Measurements of crucial parameters, such as tension of carrying ropes of the vessel or lateral dislocation of the vessel, perpendicularly to the lifting / lowering direction as well as transmission of measurement results are carried out with no stoppages of the hoisting machinery or reduction of its performance. Remote control of measurement functions, data transfer and overall supervising of the system is possible from whichever terminal of the company's computer network with sufficient authorization rights, which makes the solution exceptionally advantageous and set standards that have never been achieved in the practice of shaft operation.

The fact that is extremely important for functional features of the presented solution is that the analog signal to indicate position of the lifting vessel in the shaft pit is available from the control system (delivered by ABB). That signal corresponds to so called shaft indicator and enables location of the measuring points for values of parameters and draw graphic diagrams for functions of parameters vs. the traveled distance. As the binary signals for operating modes and current setting of the winch are also available, the monitoring system is fully integrated with the control system of the hoisting machine. Such a system offers a new quality for operation of mining hoists and is a modern, convenient and practical tools for the users.

The overall objective of its application are improvements in operational safety of mining hoisting equipment and more efficient use of the working time. Currently, when the paper is being prepared, the system is on its final stage of implementation and trial run of the equipment is in progress.