

Analysis and Model of the Sales and Shipping Operative Control in OKD

The difficulty of creating the models in treatment mainly results from complexity of the modeled subject. Each treatment plant has a different topology of the operation, different raw and washed coal warehousing capacities, different technologies used for separation and different structure of the treated coal. There is a number of effects of random and unpredictable character occurring during the coal processing and the treatment plant product shipment and sale. Another important visual angle is what is the optimization criterion, whether the treatment efficiency itself or the sales optimization.

I have oriented my work towards studying and analyzing the treatment plant product sale and shipping control, automation level and its utilization in this area, creation of the sales operative control model and proposal of its implementation. The treatment plant sale and shipping are inseparably bound up with the process of treatment. First of all, I completed a detailed assessment of the automation level in the OKD treatment plants at all levels of control (process, dispatch, and managerial). The analysis shows that the availability of sensors and automation in the operation at the level of process and dispatch is sufficient in OKD, establishing conditions for subsequent creation of systems supporting the control at the managerial level (and therefore including the sales control).

The sales operative control moves between the technology control and the quality control. In next section of my doctoral thesis, I analyzed the management in a mining company and related quality control. One of the sales requirements is quality assurance according to ISO 9000 standards. For that reason, I added a brief analysis of the quality control according to the ISO 9000 standards to my thesis, along with possible application of these principles in the process of treatment and sales control. I also assessed condition of the technical equipment required for assuring an operative control of the treatment plant product quality parameters. The analysis shows that the OKD treatment plants possess equipment that is convenient for meeting the ISO 900 requirements.

I thoroughly analyzed the sales activities in OKD, including the sales and shipping operative control, as well as the complex sales control including forecasting and balancing. There is still a link to the mining company information technology systems and mining or mine transportation models missing, a thorough integration with the sales organization of BOS in area of planning is missing as well. This avoids establishing the model, which would, besides the cognitive function, also involve ability to predict.

The operative sales control consists in the loading and shipping control, as well as in meeting the product quality parameters to meet the customer's requirements, with simultaneous effort to achieve an optimum production of the treatment plant. My thesis is based on analysis of the treatment plant control and the sales control, and creation of the sales operative control model. Having assessed the sales context and its decomposition to the control sub-systems, I processed the data and information flows in shipping in form of the data flow charts. These are followed by analysis of links between the significant subjects in the chain of coal sales. The links between the subjects are processed in the relation charts, which along with the data flow charts create the base of the sales operative control model. I used the data models to draft the implementation model (by describing the relational SQL database structures). The proposed structures contain a complete description of the information content required to record the sales trend. This allows presenting the loading and shipping trends in real time, including the quality parameter check, which is the basic tool for inspection and indirect sales operative control. Using the above mentioned procedure, I also processed certain methodology for establishing the information technology system in area of production control at the interface of the dispatch and managerial level of control – proceeding from analysis, to creating an essential model involving the system essence and its implementation.

I utilized the proposed structures in practice during the “BOS Sales” information technology system implementation at the beginning of 2001. The implementation was not complete due to unilateral orientation of the system to the business part of sales and an excessive specialization, so the model verification is only partial. However, based on experience from designing and implementing the sales information technology system in the ČSM treatment plant (1996) and from certain tasks in the product quality monitoring in Darkov treatment plant (1999), in my opinion, the model can be fully implemented and is sufficient as far as its basic function – cognition – is concerned.