

Freelance

Modernization of mining ore plant in Ukraine results in increase in production effectiveness



At Ingulets GOK's large investment project in Kryvyi Rig, Ukraine, in Phase 2 of the magnetic flotation concentrate finishing process the entire magnetic flotation technology department manages the process using a complete distributed automation system. After many years of successful operation using Freelance 6.2, it was decided to expand and upgrade to version 9.2 in March 2012.

Technologically Advanced Mining Operations in Ukraine
Ingulets Iron Ore Enrichment Works (Ingulets GOK) is one of the largest iron ore mining enterprises in Ukraine, specializing in iron ore mining and production of merchant iron ore concentrate with Fe content of 63.5% and 67.2%.

Ingulets GOK was established in 1965 and was acquired by Metinvest in November 2007. It utilises the most advanced technologies, including flotation beneficiation of iron ore, which is unique within Ukrainian industries. Ingulets GOK sources iron ore from the deposits of ferruginous quartzite at the Ingulets deposit, which constitutes 937 Mtonnes of mineral resources, including 444 Mtonnes of ore reserves in accordance with the JORC standards as of end 2009. Ingulets GOK has an annual iron ore concentrate production capacity of 14.8 Mtonnes. It currently mines iron ore from its one open-pit quartzite field through a process of drilling and

blasting and by the removal of overburden to external dumps. The iron ore is then transported by rail to, and refined at, Ingulets GOK's beneficiation and flotation facilities.

Experienced Channel Partner in Process Solutions

Sautcom Ltd, a systems integrator in Ukraine and a channel partner to ABB Ukraine, spearheaded this upgrading project, leveraging on its extensive experience across diverse industries – ranging from food and beverage, mining, glass industry, sugar industry, alcohol industry, power generation, cement, to technology.

Sautcom also provides configuration and programming services for control equipment. As a turnkey operator, its expertise includes instrumentation, process control equipment (PLC, SCADA, DCS) and engineering, mounting, process IT management and recording.

Magnetic Flotation Process

The project faced numerous challenges. They included controlling the amount of concentrate coming into the enrichment of flotation, calculating precise dosing reagent and control of discharged air and unloading, thus determining the optimal technological process in order to get the best quality and minimize losses.

InGOK has been successfully operating the magnetic flotation finishing complex (MFFC) of magnetite concentrate using the Freelance 6.2 control system.

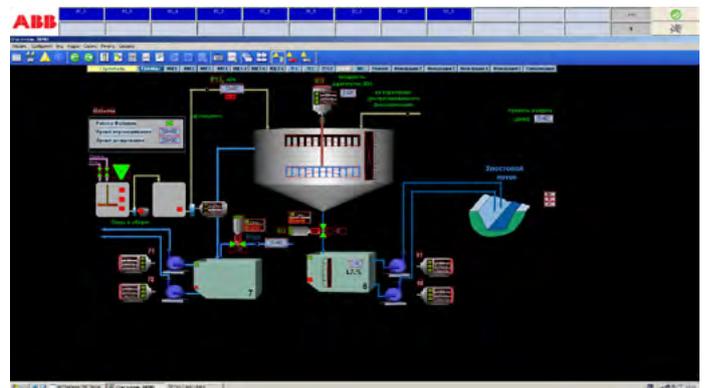
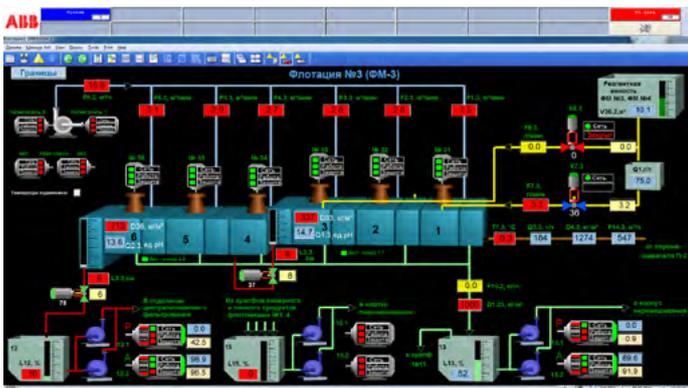
The initial product from MFFC is magnetite concentrate from the technological sections of InGOK concentrating mills.

The technological scheme MFDK includes the following:

- mixing magnetite concentrate;
- flotation;
- desliming flotation concentrate;
- filtering of desliming concentrate;
- desliming froth flotation product;
- magnetic separation desliming sands froth flotation product;
- revision middlings flotation on existing sections Ore Enrichment Plant -2;
- inspissation of concentrated drain deslimer for recycled water;
- clarification of recycled water

Meeting Requirements of a Complex Process

Freelance met the requirements of the project specifications perfectly. It enables interconnection with related ERP systems and automated control systems for the MFFC plant over



“Flotation is an extremely complicated process, efficient only when the accurate measurement of the quantity and quality of the process and management of the program is according to predefined algorithms. That’s why practically all of the technology section of magnetic flotation controls is managed by a complete distributed automation system, created based on the solution by ABB - a recognized leader in technology for power and automation.”

Andrey Perlatov, Head of Process Automation Department
PJSC Ingulets iron ore enrichment works (Ingulets GOK)



Ethernet using TCP / IP protocol and standard communication protocols (OPC, SQL). It also enables automated the continuous data collection and process.

The system was able to provide hardware and software diagnostics technology including redundancy, CPU, Profibus and Ethernet communication redundancy, easy-to-use engineering features, one software for programming, configuration, graphical display, one shared database, ready-made faceplates, wide range of ready-made function blocks, easy diagnostics and extended troubleshooting capabilities, built-in modules, CPUs and communication diagnostics, ready-made system communication, communication with ABB VFD using Profibus, simplicity in parameters assignment and finally competitive pricing.

ABB's Supply

- 2 Operators Workplace with Dual Monitors
- 1 Engineering Workplace
- AC800F redundant
- OPC Server
- Trend Server
- Total 1472 I/O

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