

Process Control System of the Iron-Ore Concentration Plant

Customer – OJSC “Poltava Mining”, Komsomolsk

Developer – “CSC-Automation” Ltd, Kyiv

Purpose

The Control System intended for automatic control of a continuous-handling systems and optimal control of PID-loops in the process of wet iron-ore concentrations including milling, classification, deslurring, magnetic separations etc.

Objects and Subdivisions

- Continuous-Handling System consists of:
56 mechanical units (conveyors, feeders, mills, pumps, hydro-cyclones, deslimers etc.) per tech.section,
8 technological sections per plant;
- The first milling stage (rod and ball mills with a closed-loop via a spiral classifier, 9 PID control loops per section);
- The second and third stages (deslimers, magnetic separators, 14 PID control loops per section).

Control algorithms features

- Concentrate quality (milling fineness) controlled by section throughput with raw iron-ore feeding;
- Maximal milling performance within required milling fineness;
- Early removing of the waste slurries to avoid excessive load on the further process equipment);
- Dynamic load transfer between milling stages;
- Minimal loss of a magnetic ore in the waste tails.

SW / HW platform

- High-reliability programmable logical controllers (PLC) from Mitsubishi Electric.
- Distributed controller’s architecture based on a remote I/O’s and CC-Link network.
- High level Human-Machine Interface (HMI) based on the world first class “Citect-SCADA” visualization and control Software.

- Mitsubishi Electric Variable Frequency Drives (VFD) for heavy duty slurry pumps VASA / METSO.

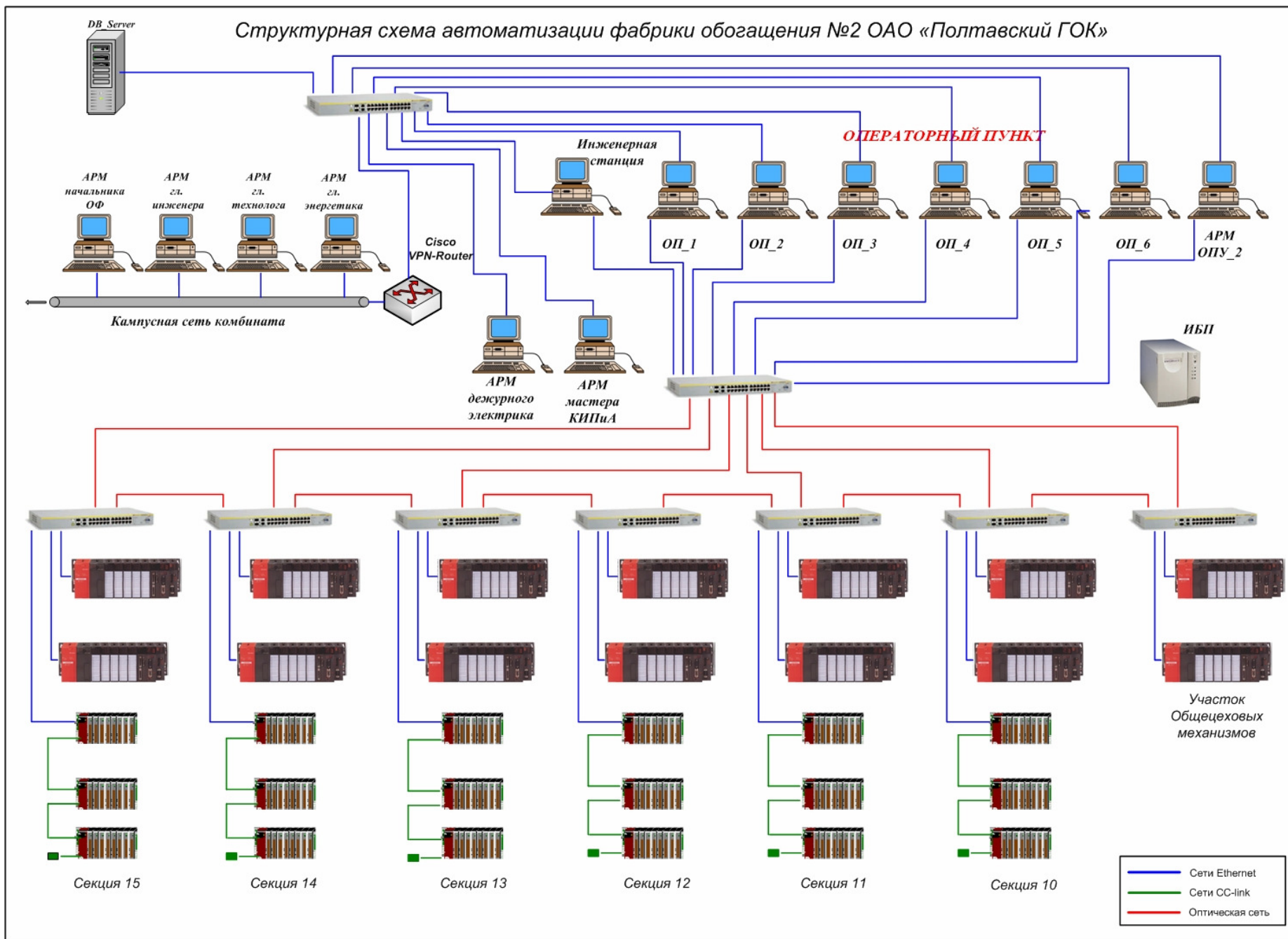
Control System Info (per tech.section)

Analog Inputs	96
PID control loops	29
Digital Inputs /Outputs	800
Section iron-ore throughput	up to 400 t/h
Mass fraction of a pure iron:	
in the raw iron-ore	34..36%
in the concentrate	up to 65,22%

Putting into the operation:

Concentration Plant #1	1994
Concentration Plant #2	2008...2014

Структурная схема автоматизации фабрики обогащения №2 ОАО «Полтавский ГОК»





The first milling stage

