

Reconstruction of main drive control system at finishing group, reserving of pinch devices of finishing group at HRM 1700

Customer: JSC “Arcelor Mittal Temirtau”

Reconstruction object: electric drives equipment at HRM-1 1700rn

RECONSTRUCTION OBJECT SPECIFICATION

Reserving of electric drives control system of finishing group at HRM 1700rn is necessary for continuous work support, if problems and accidents appeared in the main converters, also for implementation of preventive measures on the main equipment, using reserve converters changeover.

Reserve machine complex include the following devices:

- the main stand drive is an anchor
- exciter of the main stand drive
- pinch devices of the stands

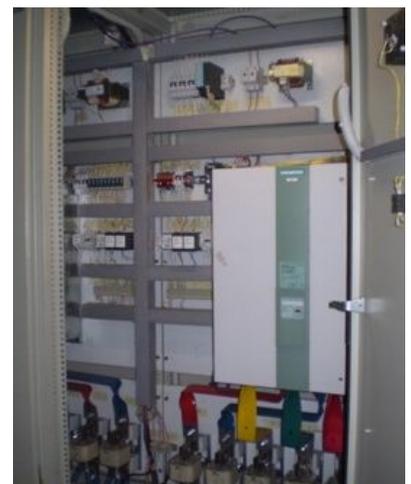
The reconstruction of electric drives was done because of big reducing of thyristor converters TEP(TBP) service reliability during operation, it often leads to breakdowns, additional delays and defective products.



Requirements to automation system

The main reconstruction target was improving of following technical and operational rates:

- equipment reliability
- ability of rapid switching to reserve.
- accuracy of technological rolling parameters support
- service availability
- electric drive work monitoring



SOLUTION AND AUTOMATION SYSTEM CHARACTERISTICS

To operate electric drives thyristor converters with microprocessor control system Simoreg DC Master model 6RA70 were chosen. They satisfy technological and service requirements.

For service convenience it was developed diagnostics and control system on the basis of operator's panel MP277. The panel is destined for displaying of drive electric equipment condition. Developed graphic OP structure allows a dispatcher to control working modes, to watch and react on all emergency and pre-emergency conditions of electric drives at stand. Also in diagnostics system it is carried out permanent archiving of parameters as follows:

- drive current (at each anchor)
- voltage (at each converter)
- thyristors temperature
- speed etc.

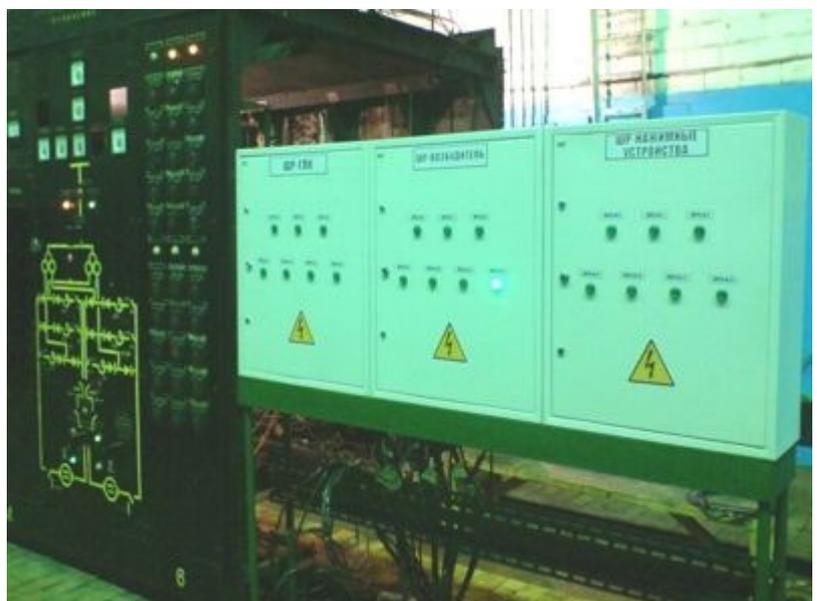
Main drive reservation control system is constructed by the following way. On the control system board it is installed reservation control cabinet GPK (SHR-GPK), where all necessary control signals of 6-12 stands are getherd together. In the reservation cabinet it was installed 20-pole connectors for connecting of one or another stand to the reserve converter GPK control system. On the cabinet doors it was installed luminous-signal armature for indication of the connected stand to the reserve converter.

During connector connection, reserve converter control system receives binary code, corresponding to connected stand number. Then comparison of three signals happens: stand code, received from the connector; stand code from the SAUS system and the signal from the power contact-breakers. Availability of these signals permits to work reserve TP, in this case availability indicator to the reserve stand work is lighted up on the cabinet SHR-GPK.

During the code recieving of the stand, in the reserve converter GPK control system with the help of multiplex swichs and the function «DataSet» required parameter adjustment happens as follows:

- signal scale of the tacho-generator;
- proportionality coefficient of the speed regulator
- coefficient task scaling at current

The proportional and integral coefficients values of



current regulator are installed according to the stand 6, 7-8, 9-10, 11-12 groups:

To simplify the work of stands control relay circuit, programmable logical controllers LOGO! 230RC are installed on each control system board (6-12), therefore LOGO takes upon itself the main control by automatic machines work of the stand motors. It is very simplifies relay control circuit configuration and provides high reliability. Also diagnostics time of emergency situation is reduced, because on LOGO it is displayed all main technological blockings, when it happens it is displayed messages with corresponding priority.

Reserve control system of GPK excitation and screwdown arrangement is constructed on the principle of main drive converter reservation.

Project implementation period

Project implementation period is 12 months, comissioning is 2009.

