

Complex Support of Power and Heat Generating Plant Control

The main benefits of applying complex support consist of predicting and finding existing power generating plant operating reserves and applying measures leading to employment of these provisions.

What is complex support of power and heat generating plant control?

The complex support of power and heat generating plant production control represents a wide spectrum of engineering services and products related to the construction, preparation and operation of power generating plants. Complex support includes:

- engineering services, consultancy and advisory services
- delivery of products from the field of control and information systems

Complex support is related to all *hierarchical control levels* of a power generating plant and to *all operation stages* of a power generating plant and is designed for fossil, hydroelectric and nuclear power plants, heating stations, combined cycles and power and heat generating systems.

Engineering services, consultancy and advisory services

Range and contents of the provided engineering services, consultancy and advisory services come out of the options listed below:

- identification of dynamic and static properties of systems
- a comprehensive proposal of control philosophy and strategy
- algorithmics of functions of continuous and discrete control
- basic data procession for realization of control systems
- implementation and parameterization of control system and its commissioning
- operational adjustment and optimization of control circuits
- optimization of operational modes for technology (in respect of design, material, economical and environmental requirements as well as the requirements on dynamics and output range)

- certification of ancillary services for Transmission System Operator (TSO)



- carrying out guarantee measurements at hydroelectric power plants (including dynamic and static measuring of hydraulic circuits, testing and tuning of hydraulic turbine governors)
- continuous diagnostics of status and characteristics of technological systems
- system integration of already existing as well as newly installed IT and process control and instrumentation systems (PCIS) facilities including programming of specific software

Products for power generating plant control

The most significant own products for power generating plant control are:

STEP – modular control system for an implementation of production dispatch centre

TELE – terminal of a superior control authority (external, mainly TSO as well as internal) in energy production control and the provision of ancillary services

OSCVANTAGE – a complex solution for the issues of the acquisition, archiving, processing, analysis, aggregation and presentation of technological data within the whole plant

PTIS – Technical operation information system of a power unit

DIGRAST – system for measuring and evaluating the electrical energy of a power generating plant

Simulators and simulation means for training and preparation of operative staff, for project design and checking, for technical support during tuning and commissioning devices

All products are easily extendable and connectable to any information or control system used in power engineering in the CR at the present time.

Hierarchical control levels of a power generating plant

Complex support involves the whole area of a hierarchical control system of power generating plant operation:

- dispatcher levels of a power generating plant control - include operational control of production of a plant as a whole, technical support for superior/sales authorities in relation to control and se of regulation deviations
- operator control of individual objects and partial production workshops in compliance with the requirements of superior control authorities (own production and business departments, external control authorities, e. g. TSO)
- operational control of functional technological complexes of power units and power grids – respecting external requirements and conditions of power supply, design, material and operational abilities and characteristics of operation technologies and particular properties of control systems

Phases of a power generating plant operation

Complex operational support is aimed at both the preparation and building phase of the power generating plant and at the operation period of the plant.

The provision of engineering services, consultancy and advisory services in the *building preparation phase* of a power generating plant is aimed at specifying the required features of the plant and the method of authenticating them.

The provision of engineering services *during realization itself* is carried out in the form of technical assistance and supervision of a delivery, acceptance and resolution of operational problems with construction including the issue of official Certificates for the provision of ancillary services for TSO.



During the period of *operation of a power generating plant*, complex support is designed mainly for device owners, with the purpose of effectively modifying the currently operated device features to fit changing operational and business conditions.

References

The experience of OSC has been gained through numerous successfully completed projects in fossil, hydroelectric and nuclear power plants, heating stations, in combined cycle power plants as well as in heating station systems. Some of our significant customers include ČEZ (CR), Dalkia Czech Republic (CR), Burštýn power plant (UA), Elektrárny Opatovice (CR), Energotrans (CR), ERÚ (CR), Plzeň Energy (CR), Plzeňská teplárenská (CR), Siemens (HU), Slovenské elektrárne (SK), Sokolovská uhelná (CR) and Teplárny Brno (CR).

OSC, a.s., company covers with its activities the area of production and distribution of electricity and heat. The Company provides a wide spectrum of engineering services, repair and consultancy services, and supplies complex, key ready sets of technical means for up to date control systems, systems for data and information processing and transfer, and simulation systems; the Company also develops special electronic elements and devices.