

## Tuning of control circuits of power generating plants

Each power generating plant suffers by wearing out and needs to be repaired during its service life. One of the many consequences of these processes is the change in the technical parameters of the plant and, as a result, changes in its operational features.

The proper function of a power generating plant is a result of its technology being in good working condition and its control circuits being correctly tuned.

OSC comes out of:

- knowledge of the operational properties of various types of power generating plants (hydro, steam, combined as well as nuclear power plants)
- knowledge of many types control systems
- skilled employees with long-term operational experience

and offers

- complex services from fault identification through behavioural analysis to the proposal and implementation of a solution
- behavioural analysis of device (technology) and location of functional faults
- updating of documentation after implementation
- modification of operational instructions if required

### When is the right time to seek control circuit tuning services?

- when deterioration of plant functions is suspected
- when routine repairs have been carried out so as to check or adjust the tuning of control circuits
- after some parts of the device have been replaced (new valves etc.)
- after new equipment has been installed
- when the current parameters of the power generating plant or its parts need to be improved

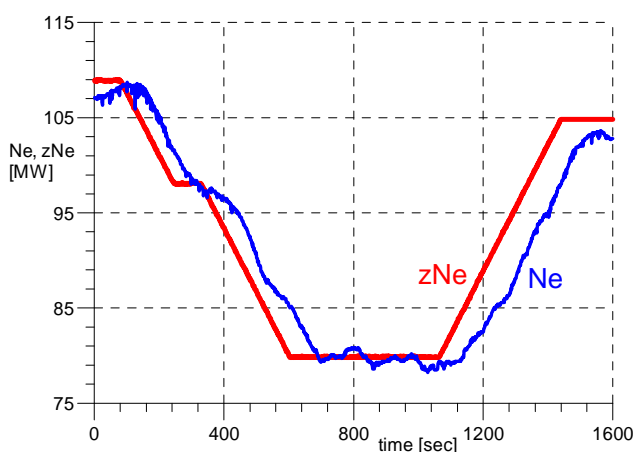
### What are the benefits of perfect tuning?

There may be a whole range of advantages of fully functional and well-tuned controllers. Above all, main advantage is perfectly working device. There is the list of some benefits:

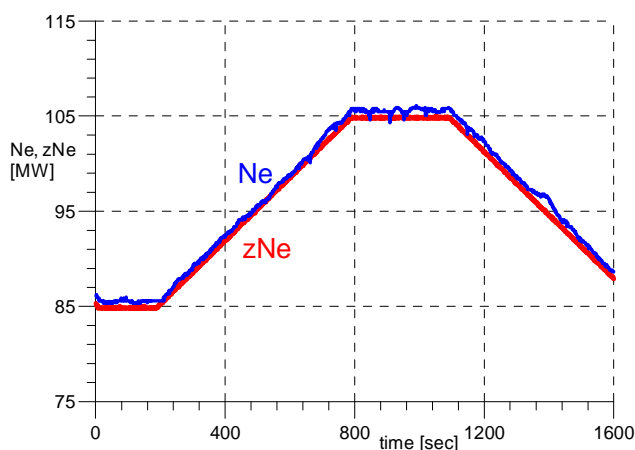
- improvement in the stability and reliability of the device
- reduction of air pollution

Course of required (zNe) and real (Ne) electric power of a power plant unit before and after tuning of control circuits

**Before tuning**



**After tuning**



- increasing of efficiency
- reduction of stress of actuators
- improved comfort and safety of operator staff
- new functions of power generating plant
- reduction of staff necessity

### What is the tuning procedure?

There are three phases of tuning.

**Identification** – ascertaining the problem. Depending on the type of problem, a documentation study may be carried out, the detailed inspection of a device, acquisition of the historical process data, discussion with operational employees. The most frequent is a combination of these methods. The results are used as a basis for the following analysis.

**Analysis** – ascertaining the real causes of problems using documentation from the previous phase. Both phases may partially merge. The analysis includes both behavioural analysis of control circuits as well as analysis of the equipment of the device itself – “the ironworks”. The results of the analyses are used to resolve the problem in the third phase.



**Synthesis** – resolution of a problem according to customer requirements. In pursuance of the analysis results, some modifications to the tuning or structure of control circuits are suggested, which are then implemented into the control system, tuned and handed over to the customer for permanent operation. Synthesis often includes documentation of changes, modification or the creation of operating instructions or a recommendation for the adoption of other measures concerning the maintenance and operation of the device.

The procedure and extent of each individual phase may vary depending on how complicated the problem is.

### What are requirements on customer?

Due to the fact that tuning is carried out in the operator's plant, mutual coordination and cooperation is essential. Customer is usually required to:

- provide the necessary documentation
- permit a detailed inspection of the immobilised device
- facilitate talks with staff
- provide the process data
- enable tests to be carried out on the operated device
- allow intervention with the control system

### What to do if you decide to tune your device?

Phone us. We will arrange for an appointment as soon as possible to discuss your problem. Thanks to the scope available to OSC, together we will certainly find a solution, which will suit your capabilities and requirements.

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.