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ENGINEERING SUPPORT OF NUCLEAR POWER PLANT OPERATION

- Preparation and performance of equipment tests
- Preparation of operating documentation
- Event analyses
- Independent documentation reviews

Since its establishment in 1992, TES has specialized in engineering services and technical support, in particular in the field of nuclear energy. Our services also include the provision of continuous engineering support to nuclear power plant (NPP) operators; we take advantage of our in-depth knowledge of NPP operation, technical know-how and hands-on experience of our experts in the management and operation of nuclear units. This intense and close cooperation with NPP operators focuses on optimizing the operation and maintenance of nuclear installations, enhancing their safety and extending the lifetime of individual NPP components and systems.

Preparation and implementation of tests



We compile test programmes and provide for their implementation and evaluation within the framework of support for everyday operation of nuclear power plants as well as for verification tests on equipment and during nuclear unit start-ups.

We test entire sets of technology as well as individual components, focusing on the verification and demonstration of their proper function as per the design parameters, identification of abnormal occurrences and determination of causes and remedies. Subject to agreement with the customer, we provide all services relating to equipment testing, for example we:

- suggest testing sites,
- set up a test programme,
- carry out the test,
- analyse measurement results,
- compile a test report.

During tests as well as during normal operation we measure analogue electrical parameters (current, voltage), physical properties (temperature, pressure, flow rate, frequency, speed, power, vibration, etc.) and binary variables (state of contacts of circuit breakers, relays, switches, contactors, automatic control technology, etc.).

We measure, record and evaluate the measured data using in particular mobile diagnostic systems



based on the MOSAD®-5 platform of our own design for rapid electrical phenomena and a variety of other simpler data loggers for analysing slower technological processes, and especially for scanning spatially remote signals, if required.

The mobile diagnostic system can be equipped with a combination of analogue and binary measuring cards up to the total number of 12.

The analogue measuring card has 8 channels, with the possibility of sampling of up to 200 ksamples/s per channel. The binary measuring card offers 32 channels, with the possibility of sampling of 1 ksamples/s per channel. Abnormal values of the measured analogue, physical and binary properties are converted to a level eligible for processing by the mobile diagnostic system.



Preparation of operating documentation

Based on our long-term experience in the production of operating documentation for the commissioning and operation of Dukovany and Temelín nuclear power plants, we can prepare the following documents:

- work procedures,
- operational programmes,
- test programmes,
- operating guidelines,
- study materials (executive summaries) for operating guidelines,
- operating personnel training.

We prepare all documentation in compliance with the customer's internal guidelines as well as the requirements of supervisory bodies and applicable standards.



Event analyses

We perform independent analyses of operating events and failures in industrial facilities. Based on our own testing or data obtained from local recording devices and available operating documentation, we perform an independent investigation of the event, analyse its causes and propose corrective actions to prevent future recurrence of similar events.

We prepare a detailed analysis report on the investigation results, including a graphical representation of the time behaviour of major system parameters and the condition of individual components (depending on the available information).



Independent reviews

Drawing on our extensive domestic and international experience in the commissioning and operation of power generating facilities (mostly nuclear power plants), we carry out independent reviews and assessments and provide expert opinions on:

- technology construction and upgrade projects,
- strategic commissioning concepts and programmes,
- feasibility and impacts of design changes to existing installations,
- licensing documentation (e.g. safety analysis reports),
- commissioning and operating documentation.