

# Protection



Automation & Control

Excitation

Power Plant Management

Monitoring & Diagnosis

**Protection**

Synchronization

Turbine Controller

# NEPTUN

# Protection



2 x 150MW, Borcka, Turkey

## Protection systems for safe operations

Electrical protection systems have to take on the task of damage containment in the event of overloading and/or a fault in the electrical equipment (generators, transformers, auxiliary systems, busbars, outgoing lead and cable units).

Power plants, transmission systems (grids and grid components) and electrical consumers have varying equipment items with different levels of priority. Many years of operating experience form the basis for sizing and choice of equipment, and also define the respective protection “philosophy” in each case.

In modernization of protection systems in existing plants, versatile and flexible equipment and systems should provide optimum solutions, both technically and economically.

The aim is to use pre-assembled equipment and standardized solutions for greater safety throughout the entire plant. At the same time, the spare part inventory required should be reduced to a minimum.

In addition to the main function of a protection system – to provide protection, modern technology should also include a number of additional features that can supply information on the protection system and, in particular, on events at the object of protection. Integrated analysis tools must be able to supply information that can be used to improve the equipment and/or its usage.



4 x 100MW, Häusern, Germany



6 x 306MW, Tianhuangping, China

## Strategic products

### DRS-COMPACT 2A

The compact protective relay is used in medium to large sized plants and offers maximum operating convenience with its local operating and display panel. The modern software structure allows programming of special, customer-specific functions.

With its compact mechanical structure, the unit can be installed easily and started up quickly.

### DRS-LLD

The power differential relay is suitable for high-voltage leads and power cables with up to six lead ends. A transformer may also be located in the protection area. Communication between protection equipment can be configured as a ring or chain network topology.

### DRS-LIGHT

The smallest protection relay in this range is used preferably in small-scale systems (generators, transformers, branch circuits, busbars, and as back-up protection). The local panel provides considerable operating convenience.

### DRS-BB

The decentralized, low-impedance busbar protection is a flexible unit with a basic concept that allows it to be used in virtually all plant types. The redundant, optical high-speed bus guarantees short tripping times.

### DRS-WIN

The modern 32-bit operating software in the DRS protection equipment provides ergonomic and clear arrangement advantages. All parameters can be set quickly, fault logging and log data visualized, with data status printouts. With the integrated remote diagnosis function, all protection equipment within the plant can be accessed easily. The software serves all equipment types and software versions supplied.

## Product range





# The comprehensive solution

## Configuration

On the basis of your requirements, we create a protection concept with the optimum configuration. After checks and secondary tests before and in the course of the factory acceptance test, our specialist engineers perform installation, primary tests and start-up quickly and pro-

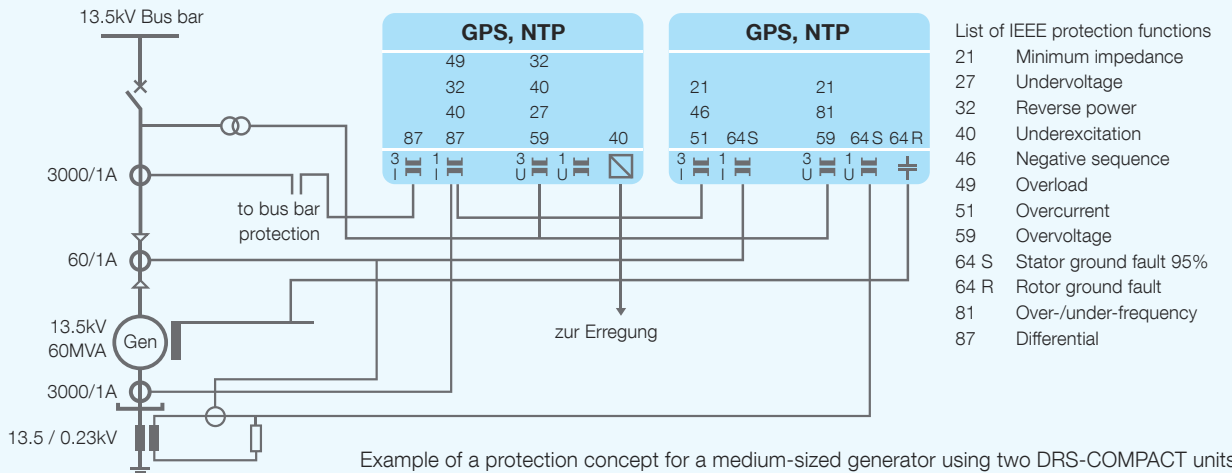
fessionally. They accompany the project right from the start. Service, spare part and maintenance contracts complete our range of services.

For smaller plants only requiring pre-assembled equipment supplies, you will also be able to carry out installation work

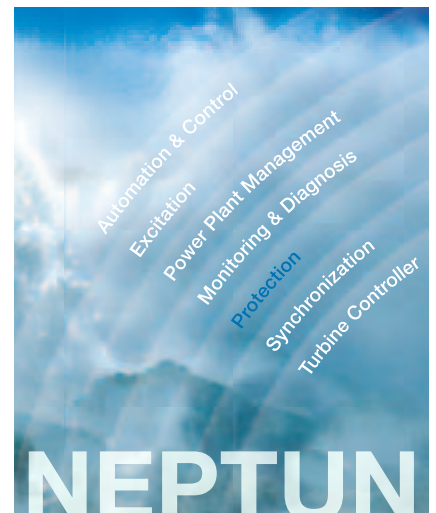
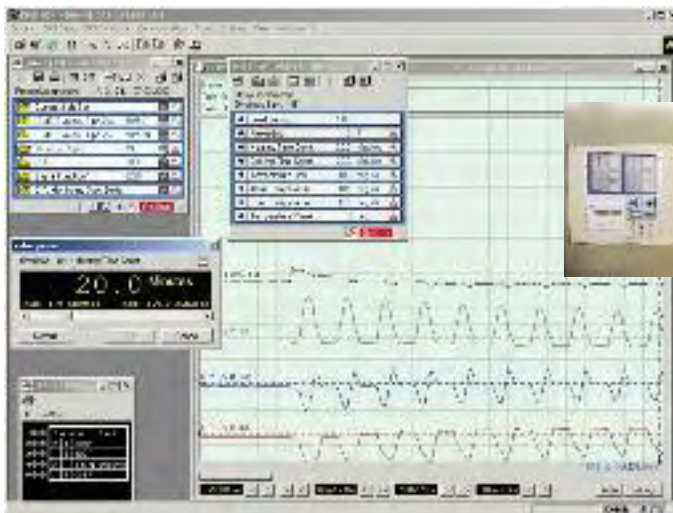
yourself very easily and at lower cost using our diagrams and start-up documentation. We can, of course, also offer engineering support for this work.

## Product range

	HARDWARE		Protective functions from library		TOOLS
	Configurable	Standardized	Configurable	Pre-assembled	DRS-WIN
DRS-COMPACT	•	•	•	•	•
DRS-LIGHT	-	•	-	•	•
DRS-LLS	-	•	•	•	•
DRS-BB	Plant-specific	•	-	•	•



## Application examples, operation



# Your benefit

## Optimal use:

- with standardized equipment models
- through considerable flexibility in configuration and redundancy
- with ergonomic operation at several levels
- through integrated self-monitoring

## Reduced costs:

- through easy training
- with fewer maintenance assignments by using remote diagnosis
- through minimum spare parts inventory

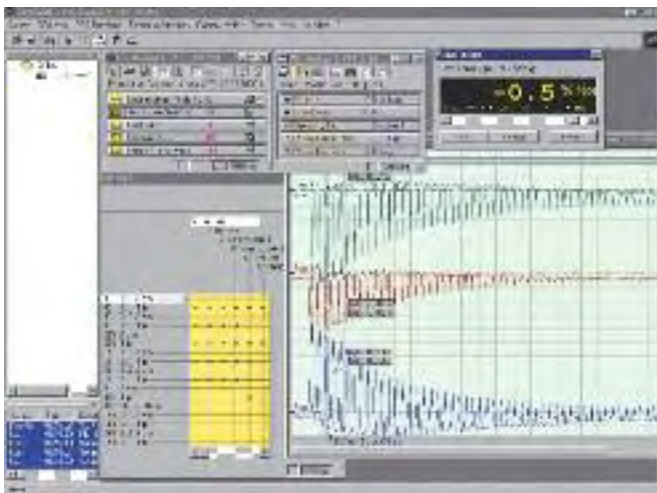
## Increased earnings:

- through reduced outage time
- with easy installation and start-up
- through longer plant service life

**NEPTUN** – the comprehensive solution for secondary systems can offer additional notable advantages in step-by-step expansion of your plant.

This gives you integrated advantages in addition to the current benefits of your protection system if additional components are used (for example excitation, synchronization, and automation & control).

- Efficient communication standard (IEC 60870-5-104)
- Comprehensive system concepts for remote functions
- Central engineering toolkit
- Simplified plant configuration
- Less engineering and documentation required
- Minimum of additional infrastructure for signal communication
- Minimum of spare parts required
- Liquidation of previously tied capital
- Fewer maintenance and service assignments on site



# NEPTUN



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