



Ongoing monitoring and maintenance for a reliable power production

# Electrical Services

## Keep your plant safe and available at all times

We help you with upgrades, lifetime extensions, repairs and troubleshooting on all electrical equipment and systems on your boiler or engine-based power plant, including:

- Detailed on-site technical survey report and recommendation on best technical solution.
- Engineering, supply, erection, test, commissioning and project management.
- Upgrade or lifetime extension of obsolete equipment such as AVR, synchronizer, control systems breakers and relays.
- Servicing existing electrical equipment like generator inspection and repair, auxiliary switchgear servicing and repair, transformer and diagnostic repair.
- Troubleshooting on operational problems including trip and root cause investigation, protection equipment setting, transformer oil DGA and more.



# Electrical Services Offerings

## Surveys and studies

- Plant energy saving
- Electrical damage
- Harmonic disturbances
- Electrical grid
- Power quality
- Protection relay test
- Fire detection
- Gas detection
- Plant electrical upgrade
- DCS control system
- ARC-flash protection
- Functional safety
- SIL & HAZOP

## High voltage substations

- Air insulated switchgear
- Gas insulated switchgear
- Transformers, DGA, oil-regeneration
- Cables
- Substation protection systems
- Substation automation systems (IEC 61 850)
- HV-system upgrades

## Medium voltage

- SF6-, Vacuum based switchgear
- Transformers, DGA, oil-regeneration
- Tap changer service and repair
- Transformer renewal/relocation
- Protection relay test and upgrade
- Generator remaining lifetime calculations
- Generator service and repair
- Generator exchange
- AVR excitation system upgrade
- MV-system upgrades
- Cables

## Low voltage

- Infrared scanning
- Emergency/Black start generators
- Electrical installation LV, MV, HV
- Electrical installation DC/UPS- systems
- Electrical installation instrument and control system
- Optic fiber cable installations
- Electrical auxiliary equipment
- ATEX study & solutions
- Fire detection installation

## Automation systems

- Online DCS service and support
- DCS control system upgrade
- Engine and boiler control system upgrade
- HW & SW upgrades
- Cylinder liner monitoring systems
- Oil mist detection systems
- IT(DCS)-security

## Renewable Energy Solutions

- PV & BESS solutions
- PVsyst developing and analysis
- HOMER simulation/optimisation
- Synchronous condenser solutions

## Software engineering tools

- Neplan
- ETAP
- Comos
- PVsyst development SW for PV-systems
- HOMER. Hybrid Optimization of Multiple Energy Resources
- Dynamic network simulations

## Selected references



### Electrical upgrades, Denmark

**Facility:** Vestforbrænding

**Scope:** Major replacement of some of its electrical distribution systems, which are connected to the 10 kV ring.

**Completion:** 2021



### Test of MV protection systems, UK

**Facility:** Cramlington

**Scope:** Electrical tests on all MV protection systems

**Completion:** 2022

## About BWSC

Headquartered near Copenhagen, Denmark, BWSC provides specialized consultancy, engineering, installation, operation and maintenance services at power plants and green energy facilities worldwide.

Forty years of experience with energy infrastructure, a diverse staff of seasoned experts, full technology independence and our big-picture approach make us uniquely able to help customers define their ambitions and reach them through expert design and continuous improvement of their facilities.

# BWSC



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