

# Substations

**Making expansion simpler,  
safer and cost effective**



**We provide services for substations around  
the world.**

**Mott MacDonald is a global management, engineering and development consultancy with a strong engineering base. With annual revenue of £1 billion, we combine the skills of over 14,000 staff with a strong presence in 140 countries. For decades Mott MacDonald has been at the forefront of international consultancy for the planning, engineering and implementation of substation projects. Whether the substation forms part of a wider transmission or distribution development scheme or is a project in its own right, we have the proven capability to provide world class engineering services tailored to suit the needs of the project and the owner.**

## **Our services**

Mott MacDonald's team of highly experienced engineers provide exceptional services in substation planning, consent and engineering, and supervision of installation and commissioning. They possess the latest knowledge in AIS and GIS substation design and can provide full secondary system design for new substations and upgrades to existing schemes.

Our expertise on several hundred substations covers all voltage levels up to 500kV employing the latest switchgear designs for either outdoor or indoor facilities.

Our services cover:

- Auxiliary systems
- EHV cables
- Overhead line systems
- Power station switchyards
- Protection systems
- Specialist studies and surveys, including insulation co-ordination and power system planning
- Switchgear
- Telecontrol and telecommunications
- Transmission substations



**A typical outdoor substation.**

[www.power.mottmac.com](http://www.power.mottmac.com)

**Mott MacDonald**



West Bay area electrification, Doha, Qatar.

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## Our capabilities

Our substation team specialises in complete project management of substation projects up to 500kV, including:

- Auditing detailed designs
- Auxiliary system design and specification
- Civils/buildings design
- Computer-based substation control systems
- Control and power cabling
- Detailed design
- Detailed design solutions for integration/interfaces with existing systems
- Earthing system studies and design
- Harmonic and filtering studies
- HVDC system design
- Insulation co-ordination
- Metering
- Overhead systems
- Protection and control, including power system protection, fault calculations, relay scheme design/equipment technical specification, application engineering/relay setting calculations and troubleshooting, testing and commissioning of new and existing installations and protection upgrading/refurbishment in existing substations
- Power station switchyards
- Power systems control and communication specification
- Site selection
- Site supervision and commissioning
- Specification
- Substation auxiliary plant and services, including fire detection and protection schemes
- Switchgear – outdoor and indoor, GIS and conventional – including type test approvals, independent review of studies, development of plant layouts and battery and UPS system design
- Tendering
- Testing substation components
- Transformer and static compensation design

## Recent projects

- **South East Electricity Strategic Alliance, UK** Strategic alliance with National Grid UK to carry out all 400kV and 275kV substation projects in the South East England region in a streamlined and cost effective manner for five years. Work ranges from the earliest project stages through to commissioning, including high-level project management, design assurance, quality control and cost control.
- **Transmission development, Middle East** Construction of nine new indoor GIS substations and the extension of an existing 220kV substation. Our role includes complete consultancy services from conceptual design to commissioning of 31 bays of 220kV GIS, 119 bays of 66kV GIS, 261 bays of 11kV switchgear, six 220/66kV 200MVA transformers, twenty seven 66/11kV 40MVA transformers, 34km of 220kV cables, associated plant and equipment and modifications to the National Control Centre.
- **Framework agreement, Europe** Mott MacDonald has been appointed to carry out detailed engineering and project management for a major national network up to 380kV. This covers overhead lines and substations for upgrade and new build projects. This framework is generating a number of projects that we are involved in including at least two major transmission substations for a national network development plan.

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To find out more see our dedicated microsite  
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