

Blackhillock Substation and Spittal Substation,  
Caithness-Moray HVDC Link, Scotland

# Future proofing the North of Scotland's electricity network

**£66m**

/ Project value

**February 2016**

/ The project commenced

**January 2019**

/ The project was completed

As part of the wider £1.1bn Caithness Moray Shetland energy project, we constructed twin state-of-the-art High Voltage, Direct Current (HVDC) substations in Blackhillock (Moray) and Spittal (Caithness). Completed in January 2019, the duplicate facilities are key infrastructural components of a new HVDC 1200/800MW link, which connects the transmission network between Moray and Caithness. We were appointed by ABB (ASEA Brown Boveri) to undertake the associated civil, structural and building works.

## The brief

Scottish Hydro Electric Transmission Ltd (SHETL) identified the need for a subsea power link, capable of carrying up to 1,200 megawatt (MW) of electricity between Caithness and Moray. The completion of the reinforcement projects at Blackhillock and Spittal would help meet this demand, and support the future transfer of generated power on to the UK electricity transmission grid.



**"The Caithness-Moray project is at the heart of the biggest renewal of the north of Scotland's electricity network in a generation."**

David Gardner  
Director of Transmission,  
Scottish and Southern Energy

“The Blackhillock Substation and Spittal Substation project is supporting the biggest renewal of the north of Scotland’s electricity network in a generation. We are proud to have played our part in the delivery of this important scheme.”

Alastair Lewis  
GRAHAM Contracts Manager

### The challenges

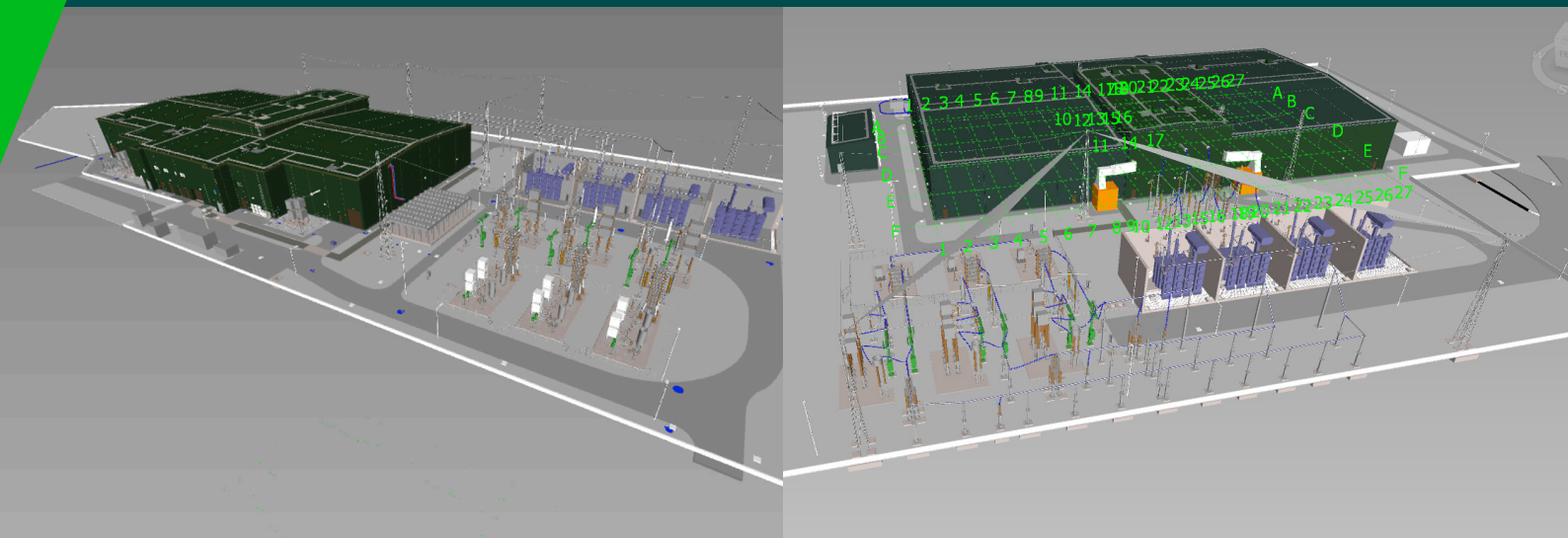
Both sites, situated in remote northern parts of Scotland, were contained within live, and operational, AC Electrical Power Distribution stations owned and operated by Scottish and Southern Energy (SSE). Therefore, it was critical that we fully complied with all planning consents as well as SSE and ABB policies and procedures. At Spittal the existing 132kV overhead lines had to remain fully operational throughout the duration of our programme. As expected in the Scottish Highlands, the weather was also a formidable foe, with blasts of snow common-place throughout the months of December and January.

### The solution

The Blackhillock and Spittal Substation construction projects, with a combined value of £66m, are supporting SSE’s broader aims of transferring more power, more efficiently for the people of Scotland. Located in remote areas, either side of the Moray Firth, the sites are over four hours apart. Nevertheless, the facilities are almost identical and include a main convertor building with a footprint of 6527m<sup>2</sup>. A three-level Control Room, a Spare Parts Building and MVS Building are further elements of each site, in addition to a Valve Cooling Area and a 3500m<sup>2</sup> External Yard. 200 tonnes of steel were fabricated, galvanised and erected per week and approximately 620m<sup>3</sup> of rock and 9,800m<sup>3</sup> of earthworks were excavated and removed. Demonstrating the scale of the twin sites further, 800m<sup>3</sup> of attenuation materials were installed and around 2200m<sup>3</sup> of concrete were poured for the convertor substation pad, foundations, cable trenches and transformers and over 800 tonnes of structural steelwork. Our programme began in February 2016 and concluded in January 2019.

### Outputs & Benefits

- / **Powering Northern Scotland:** Two separate projects but with the single aim of modernising Scotland’s electricity network
- / **Complex Construction:** We were trusted with completing all complex civil, structural and building works
- / **Scope and Scale:** Approximately 620m<sup>3</sup> of rock and 9800m<sup>3</sup> of earth were excavated and removed
- / **Steel Manipulation:** At different stages over 200 tonnes of steel were fabricated, galvanised and erected per week



For more information on how we’re delivering lasting impact:

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