How we delivered 3 megawatts of off-grid intelligent power for Balfour Beatty

Providing 3 megawatts of temporary off-grid power to a 300 resident capacity accommodation village through a synchronised configuration of generators that has the ability to flex in-line with demand.

Synchronised stage V generator system that reduces emissions

3MW of off-grid power delivered

24/7 throughput of varying power supply in-line with site demand

As the principal contractor for the Skye 132kV Reinforcement Project, Balfour Beatty are delivering improvement works to the high voltage electricity transmission running from Fort Augustus through to Edinbane on the Isle of Skye.

The project will see 137km of 132kV double circuit overhead lines, supporting pylons and 15km of underground cabling installed, replacing ageing infrastructure dating back to the 1950s. The aim is to vastly improve the delivery of reliable energy to the most remote locations in Scotland, ensuring residents and businesses are better connected with reliable energy for the future.

To carry out the works, Balfour Beatty has put together a team of 300 workers, however the remote nature of the project means daily commuting won't be possible, so they have built the first of a series of self-sufficient accommodation villages to house their personnel. The village presently sits at Fort Augustus, featuring accommodation cabins, office cabins, canteens, lounge areas, an on-site gym and more.

Challenges

A village of this size with hundreds of residents requires a large throughput of power, however it can take 2-5 years to attain a supply from the grid, so temporary off-grid power is necessary in the meantime. It is estimated that up to 3 megawatts (MW) of temporary power would be required at peak load times, but this load will inevitably shift in-line with site activity. This means that the solution must be large enough to deliver 3MW of power, intelligent enough to flex in-line with fluid power demands of the site, and reliable enough to deliver energy 24x7x365 – a rare capability in the UK power generation market.

Our equipment and services supplied at a glance

- 6x 500kVA Stage V Generators
- 3x 20,000L Fuel Tanks
  - Including fuel management
- 6x 1650L AdBlue Tanks
- 1x 4000A MDU Panel
- 1200m+ of 240mm Cabling
- Site Secure Office Cabin for Always-On Engineering Watch-Keep
  - Including dedicated engineering support

Solution

Following our approval as a preferred equipment rental partner for the site, our experts began designing a bespoke solution that would sit at the heart of the site to deliver power at scale. The solution, delivered and integrated from May 2026, is driven by 6x 500kVA stage V generators supported by fuel tanks, Adblue tanks, a single 4000A MDU panel and more than 1200m of associated cabling. This load share demand configuration approach to generator scaling means that we have greater flexibility to manage variable loads, so the solution can more closely match the output required, scaling up as well as down to eliminate unnecessary excess output – therefore driving down generator run time, fuel burn, emissions and ultimately cost.

Prior to this solution being installed we wanted to prove its capabilities to the technical teams at Balfour Beatty, so we invited them to witness a load test at our closest power generation depot. This load test mimicked the fluid demands of the site, each of these demands being met with instant sustained power, successfully proving its capability and future likelihood of success on-site.

As we approached installation, our dedicated project manager liaised closely with other contractors on-site to ensure that our deliveries were organised as necessary and lift plans scheduled accordingly with wider works so as not to cause any unnecessary disruption or delays to the wider project schedule. Once the solution had been manoeuvred into position, our expert team completed the full installation, commissioning and electrical sign off – demonstrating our in-house capability at Sunbelt Rentals.

To compliment all of this, we have integrated a full watch-keep solution, ensuring we have an engineering capability on-site in our site control cabin to control and manage the solution.

This, alongside our equipment telemetry means that we are able to minimise any downtime, keep the power on and ultimately keep living standards high for those living on-site.

Result

With the solution now commissioned and handed over to the Balfour Beatty internal electrical team on-site it continues to provide a stable and reliable throughput of power directly in-line with site demands. Since go-live the Balfour Beatty team have expressed high praise for the solution, complementing its performance, configuration and reliability.

A multi megawatt solution like this is inherently complex to deliver but the Balfour Beatty team commented on the seamless nature of our delivery, drawing upon the peace of mind we were able to provide to them during the load test that everything will deliver as planned considering the highly critical nature of the power supply. Also, the configuration of equipment on-site means that we will be able to easily perform any alterations or maintenance activities without needing to manoeuvre any kit.

All of this means that Balfour Beatty can fully concentrate on carrying out their necessary works on the 132kV Reinforcement Project, ensuring residents and businesses are better connected with reliable energy for the future.

Reliable off-grid power delivered

Totalling 3MW of energy

Powering an accommodation village

Leave the how to us.