The cable cleats chosen for SA's first hybrid solar battery project

CCG Cable Glands and Cable Cleats are installed on South Africa's biggest solar battery storage system, the Kenhardt hybrid solar and battery energy storage facility in the Northern Cape.

The facility boasts a combined installed solar capacity of 540 MW from three plants, and its massive battery system can output up to 225 MW of power. With a 1 140 MWh capacity, the battery can supply 150 MW of dispatchable power consistently between 05:00 and 21:30 throughout the year.

The project was one of the world's first and largest hybrid solar and battery storage facilities built. Construction of the Kenhardt hybrid facility started in July 2022 and included the installation of almost 1 million PV modules. At the peak of construction, the site employed 2 600 workers. The entire hybrid facility spans 879 hectares and extends 10 km from north to south.

CCG supplied all the cable glands and cable cleats for the 9 000 kilometres of cabling (equivalent to the distance between South Africa and Norway).

Of critical importance was the use of CCG's trefoil cleats for securing the single core cables linking the transformers to the battery rooms.

CCG's range of trefoil cleats was used on the entire MV cable system and the collector runs, which were divided into 6 x Spur-feeders and two Mini-sub feeders. Cables used in each feeder were:

- 500 mmsq 1C AL XLPE MDPE Unarmoured Copper wire screen cable 19/33 kV.
- 300 mmsq 1C AL XLPE MDPE Unarmoured Copper wire screen cable 19/33 kV.
- 185 mmsq 1C AL XLPE MDPE Unarmoured Copper wire screen cable 19/33 kV.
- 150 mmsq 1C AL XLPE MDPE Unarmoured Copper wire screen cable 19/33 kV.

The international standard governing cable cleats used in electrical installations is IEC 61914:2021. In this standard, Cable Cleats are defined as "devices designed to provide securing of cables when installed at intervals along the length of the cables".

Cable cleats are designed to ensure that cables are fixed, supported, and routed in a manner that provides safe operation and reduces the risk of damage or injury in the event of a short circuit fault, emergency, or accident. Improper clamping of cables can result in loss through unnecessary downtime or even injury and death.

CCG's range of single and trefoil cleats are designed to restrain single or trefoil cables onto ladder tray or strut systems. They are manufactured from corrosion resistant, magnetic free, 316 stainless steel with LSOH and UV protected polymeric linings for cable protection. They have an open-hinge single-bolt fastening system allowing for ease of installation for a wide range of cables from 13 mm to 128 mm.

CCG's cleats are designed to withstand mechanical forces caused by fault currents of up to 180 kA.

The battery section of Scatec's 540 MW/1 140 MWh Kenhardt hybrid plant.

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