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Thu-Mo-Po.09-04: Design and Construction of the Frascati Coil Cold Test Facility for Big Size Superconducting Magnets

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The large facility under construction at the ENEA Frascati Research Center, named Frascati Coil Cold Test Facility (FCCTF), has been designed with the original purpose of testing the superconducting magnets of the DTT (Divertor Tokamak Test facility) experimental reactor in cold conditions (4.5 K inlet temperature) and high current up to 43 kA. In a 600 m2 large hall, FCCTF will host a large cryostat, a supercritical Helium refrigerator, a High-Current/Low Voltage power supply and an associated safety discharge system for protection in case of quench, thus allowing a safe investigation of the coil behavior in close-to-operative conditions.
The large cryostat is a vessel, with a removable top lid, capable of housing magnets up to 7 meters long, 3 meters wide, and 1.7 meters high, with a maximum weight of 17 tons. It is equipped with a pair of BiSCCO current leads capable of handling up to 43 kA. The Linde Helium refrigerator cooling system for the FCCTF provides helium at a maximum inlet pressure of 12 bar and a mass flow rate of 73 g/s. It offers a refrigeration thermal capacity of 500 W at 4.5 K plus 450 W at 16 K, ensuring the necessary cooling power for effective superconducting coil testing.
In this contribution, the design of the main components and features of the facility will be described together with the time schedule leading to the final commissioning fixed for mid-2027. Finally, the current status of the FCCTF implementation will be reported.

Authors: Dr DI ZENOBIO, Aldo (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); DELLA CORTE, Antonio (Enea); Dr THAERI, Babak (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); Mr CACCIOTTI, Emanuele (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); Dr FABBRI, Fabio (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); Dr CELENTANO, Giuseppe (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); Dr MUZZI, Luigi (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); BOMBARDIERI, Michele (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); Mrs FREDA, Rosa (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); CHIARELLI, Sandro (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department); Dr TURTU, Simonetta (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department)

Presenter: Dr CELENTANO, Giuseppe (ENEA - Frascati, Superconductivity Laboratory - Nuclear Department)

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