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Upgrade of the Grenoble High Magnetic Field Facility

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The Grenoble steady magnetic field facility is one of the four high field facilities part of the European Magnetic Field Laboratory. The upgrade of the Grenoble facility has started in 2013 and aims in a first phase at increasing the electrical power from 24 to 30 MW and to develop the high field magnets accordingly. A new 18 MW power converter has been made available to users in 2017 and replaces two of the four 6 MW units. It will be used during the next three years at a reduced 12 MW power imposed by the current power transformer. 18 MW will be available after the commissioning of a new 60 MVA transformer. In 2017 the flowrate pumped from the nearby river will be increased from 1400 to 2000 m³.h⁻¹. A new 36 MW heat exchanger will be installed at the interface between the primary circuit and the deionized water closed loop. The last step will consist of upgrading the 2 remaining 6 MW units. At the end of this operation, 36 MW should be available to feed the magnets. In parallel, the LNCMI is developing a new compact polyhelix insert capable of absorbing 18 MW instead of 12 MW. This insert needs to have the same outer diameter as the 14 helix insert currently in operation so as to fit in existing external bitter magnets. To optimize the energy costs incurred by this upgrade, studies are being conducted to take advantage of the heat generated by the magnets to heat neighboring buildings. The performance of the new power converters will be assessed from the detailed analysis of the stability of the magnetic field and the electrical currents.

Submitters Country

FRANCE

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