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Magnet Test Facility Upgrades at LBNL

The Magnet Test Facility (MTF) at LBNL belongs to the Superconducting Magnet Group, and serves a core mission of testing performance characteristics of high field superconducting accelerator magnets. Several magnet parameters, such as maximum quench current, training behavior, and field quality are tested and characterized at MTF. The facility is currently being upgraded to expand the magnet characterization range. Three key new systems are going through a series of tests: the High Current Power Supply (HCPS), the Energy Extraction System (EES), and the Quench Detection System (QDS).
As a magnet quenches, its resistance grows via quench propagation and the internal temperatures as well as the voltage in the coils increase rapidly. To protect the magnet from thermal and voltage induced damage, a prompt detection of the developing quench and subsequent energy extraction should be accomplished. Once a quench is detected by the QDS, the power supply is shut down and the energy of the magnet is extracted by the EES by means of a dump resistor. This dump resistor needs to be configurable and its resistance selected depending on the magnet inductance.
An overview of the new facility focusing on the new systems as well as operational experience from the first magnet tested after the new Power Supply installation is presented.

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