LHC Machine Protection Review



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Safe beam energy tracking

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Safe dumping of the LHC beam relies on accurate tracking of the LHC beam energy, since the strength of the dump system elements must scale with the beam energy to obtain the correct extraction trajectories. The LHC Beam Energy Tracking System (BETS) is responsible for the generation of the kick strength reference signals w.r.t. the beam energy of the extraction kicker high voltage generator power supplies. The system also performs continuous surveillance of the charging voltage of the different circuits within the high voltage generators and generates a dump request if the measured values are not within predetermined tolerance windows relative to the beam energy. In addition, the BETS will provide the calculated beam energy value to Safe LHC Parameters system (SLP) for the generation of the Safe Beam Flag signal and the distribution to other users. The architecture of the BETS, based on a modular approach, will be presented and the functionality of the different components included within the system described. Protection against possible failures within the BETS system itself will be discussed in more detail. Finally, validation tests of the complete BETS scheduled in 2006 in the SPS will be presented.

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