ISIS Main Ring Dipole Coil Failures

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ISIS is a Spallation Neutron Source facility and has been providing neutron scattering capabilities for researchers in materials science since its first operations in the mid 1980's. Part of the ISIS accelerator systems consists of an 800 MeV rapid cycling synchrotron, operating at 50 Hz. The time varying magnetic fields inside the magnet apertures, gives rise to high voltages of around 15 kV rms in the magnet coils of the 10 synchrotron super periods. Since 2002 the coils inside the main ring dipole magnets have been failing. As these coils have failed, they have been replaced with newly manufactured coils. Initially, the new coils were expected to last at least as long as the originals. However, since 2013 these new coils have also been failing, with a MTBF far lower than the original coils. This presentation describes the failures, the process used to develop a better understanding of the failures and the lessons learnt by going through the process.

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References:

[1] F. Author, S. Author and T. Author, *J. Phys. Rev.* **Vol**, Page, (Year).