

Mag-03 and Spectramag-6 used for pre-installation site surveys

Objectives

To increase efficiency and safety by helping survey the sites of MRI and electron microscope facilities before construction begins.

Instrumentation

- Mag-03 three-axis magnetic field sensor
- Spectramag-6 data acquisition unit

Application

Magnetic surveys of sites for proposed MRI suites or electron microscope facilities to determine suitability/safety.

Background

MRI machines and electron microscopes use magnetic fields to carry out precision imaging techniques and are thus sensitive to vibrations and magnetic noise; external fields will interfere and distort the images. Vibration acts in the same way as an AC field, by moving the equipment in a static field. Active cancellation systems are used around them (see Bartington Instruments case study¹) but it is still important to install them in the quietest locations possible. To test the suitability of proposed

sites, magnetic and vibration surveys are carried out before the equipment is installed.

Method

The Spectramag-6 unit is an A/D converter and a power supply data acquisition unit. It was designed for site survey investigations and has the facility to connect accelerometers and acoustic sensors as well as magnetometers (including the Mag-03). A typical site survey set-up would include a Mag-03 and an accelerometer: the Mag-03 for the magnetic survey and the accelerometer for the vibration survey.

The magnetic survey is used to detect the influence of passing traffic, elevators moving past, and any AC fields produced by electrical equipment within the building. The vibration survey measures the levels of building vibration caused by regular foot traffic or machinery.

The site surveys are carried out over differing time periods, from a few minutes to several hours, to measure slow varying influences.

The manufacturers of the equipment being installed have specified limits as to what levels of fields are acceptable in both time and frequency domains. To determine easily if a site fits the stipulated parameters, the Spectramag-6 software has the option of setting a pass/fail point in both time and frequency domains. The pass fail limit is clearly displayed as a green banner or a red banner if limits in either domain are breached.

¹ <http://www.bartington.com/Literaturepdf/Case%20Studies/magnetic%20field%20cancellation.pdf>



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