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PANEL ON MAGNETS FOR NUCLEAR MAGNETIC RESONANCE MEDICAL APPLICATIONS

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The members of this panel were: J.E.C. Williams (National Magnet Laboratory M.I.T.), L.L. Luiten (Philips), R.S. Allen (Oxford Instruments), E. Adam (Airco), G. Boegner (Siemens), D. Dewinter (Magnetic Corporation of America) and D. Phillips (Intermagnétique General).

After a review of main characteristics requisite for Spectroscopy and imaging magnets in medical applications, all types of magnets that fulfilled the necessary conditions were presented.

The useful characteristics are: maximum field strength, initial cost, necessary supply power, operating cost, weight, effects of magnet on environment and vice versa.

Effects of Magnet on environment become very important for field strength exceeding one Tesla and special building or magnetic screens are necessary. High field strength gives a better sensitivity for spectroscopy and imaging systems but increases the set up cost so the choice of a magnet is particularly difficult. It seems at that time, that every means must be explored in order that the best technical and economic solutions could be found. In this aspect, permanent magnets seem to be an interesting solution if their performances are proven to be suitable for high quality imaging systems.

Problems of interactions between switching gradient coils and magnet have been raised. Iron pieces or cryostat walls and coil mandrel are crossed by eddy currents that introduce distorsions on the field gradient.

Effects of magnetic field on human body have been discussed. It seems that under a working field of 2 Teslas, no influence has been observed, the main danger is due mainly to loose ferrous objects that might be attracted by the magnetic field.