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## HEALTH AND SAFETY COMMISSION

### Publication of Research Results: Impact of the EMF Directive on Magnetic Resonance Imaging (MRI)

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Cleared by Board Member: Giles Denham on 11 June 2007

#### Issue

- 1 EMF Directive: publication of HSE funded research report.

#### Timing

- 2 Routine. Publication of the research is on 13 June.

#### Recommendation

- 3 For information only.

#### Background

- 4 The Commission discussed the EMF Directive on 15 May ( Paper HSC/07/31 refers). An important aspect is the potential impact of the Directive on MRI in health care. The HSC paper explained that HSE has funded research into the scale and nature of the Directive's impact on MRI.

#### Argument

- 5 The report of this research – commissioned from MCL-T Ltd - will be published on 13 June on HSE's website. A note on the headlines of the report is attached at Annex 1. The European Commission (EC) is being advised of its publication.

#### Presentation

- 6 The report is a useful contribution to the debate about the potential impact of this Directive on important MRI health care procedures. It is hoped the report will assist the EC in any review of the EMF Directive.

## **Annex 1**

### **EMF Directive: Impact on MRI**

#### **Title of research: Assessment of electromagnetic fields around MRI equipment**

#### **Background**

- In late 2005 the MRI community made a press statement, raising concerns that the EMF Directive would prevent important clinical procedures, since workers would be exposed above the absolute Exposure Limit Values (ELVs) in the Directive. Following this HSE held a round-table event with the MRI community where it became clear that there was insufficient data to be sure whether this was the case
- In order to resolve this uncertainty, HSE commissioned research in Spring 2006 to calculate and measure worker exposures around MRI equipment.
- The research used both computer models to calculate exposure, and volunteer studies to measure field strengths during normal working shifts, around 3 types of machines.
- The results will be published on 13 June.

#### **Results**

Within approximately 1 metre of the 3 machines studied, the ELV in the Directive are exceeded:

- from exposure to switched gradient fields (during image acquisition)
- by moving through the static field at only 1 m/s (at all times). Faster movement would bring the distance at which the ELVs are exceeded to even further from the machine.

The size of the magnet has some impact on the distances involved but does not significantly change the results.

#### **What do the results mean for MRI?**

- All procedures where workers currently stand within approximately 1 metre of an MRI machine during image acquisition are affected. This is likely to include all “interventional” MRI, where they are close to the machine to, for example, monitor a patient under sedation, give an injection, or carry out other clinical procedures. It is possible that some procedures could continue through changes in working practice but it is unclear whether all procedures could be modified sufficiently.
- Regarding movement in a static field, this is dependent upon interpretation of the Directive. There are two different interpretations of its current wording relating to which exposure limit value should be used for a person moving in a static magnetic field. One interpretation would mean that every movement in an MRI room would need to be assessed, and expensive equipment and procedures might be required. The other interpretation would mean there are no implications.

#### **Conclusion**

A small, but important, percentage of MRI procedures, as currently practised, would not allow compliance with the Directive. Implementation in its current form would therefore have the effect of compromising some important MRI applications in health care.