

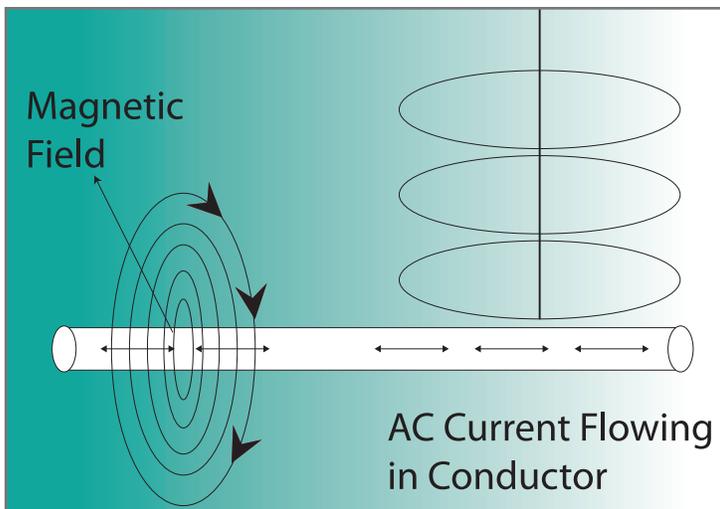
Electromagnetic Fields

Electromagnetic fields (EMF) are invisible lines of force resulting from a combination of electrical fields (produced by voltage) and magnetic fields (produced by current) emitted by an object. Electric and magnetic fields (ELF - EMF) surround all electrical devices.

Alternating current (AC) produces extremely low frequency (<300 hertz) electric and magnetic fields that are associated with the generation, transmission, and use of electric power. Direct current (DC, 0 hertz) produces static magnetic fields (SMF) and is generated by DC equipment such as motor drives, arc welders, and electromagnets.

A variety of equipment used in electric power generation and manufacturing plants as well as in medical facilities can produce high EMFs. Typical sources include:

- High-voltage transmission and distribution lines
- Electrical generators and transformers
- Electric arc and induction furnaces
- Permanent magnets and electromagnets
- DC motors and large AC motors
- Arc welding
- Magnetic resonance imaging (MRI)



Electromagnetic Interference

According to the US Food and Drug Administration (FDA), electromagnetic interference (EMI) can affect various implanted medical devices, including cardiac pacemakers and implantable cardioverter-defibrillators. EMI occurs when signals from an electromagnetic field temporarily interfere with the intended operation of the implanted device.

There are no federal standards limiting occupational exposure to EMFs. Voluntary exposure guidelines, however, have been developed by the American Conference of Governmental Industrial Hygienists (ACGIH) for workers with pacemakers and implantable cardioverter defibrillators. These guidelines are:

ELF - EMF		Static Magnetic Field
Electric Field	Magnetic Field	
1 kV/m	1 Gauss	5 Gauss

Field surveys are performed to determine the levels of EMFs at locations where medical device wearers (either employees or visitors) may be present. This information is used to identify areas for placement of warning signage where EMF levels exceed guidelines, to sketch isometric lines for control area delineation, and to measure the effectiveness of engineering controls. Risks to employees can be managed by risk assessment, identification, and control.

About EQM

EQM is a full-service environmental consulting, engineering, and remediation firm. In addition to our corporate headquarters in Cincinnati, EQM has eight offices located throughout the United States.

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