Brookhaven National Laboratory

U.S. DEPARTMENT OF ENERGY

TAKE FIVE for Safety- Magnetic Field Safety

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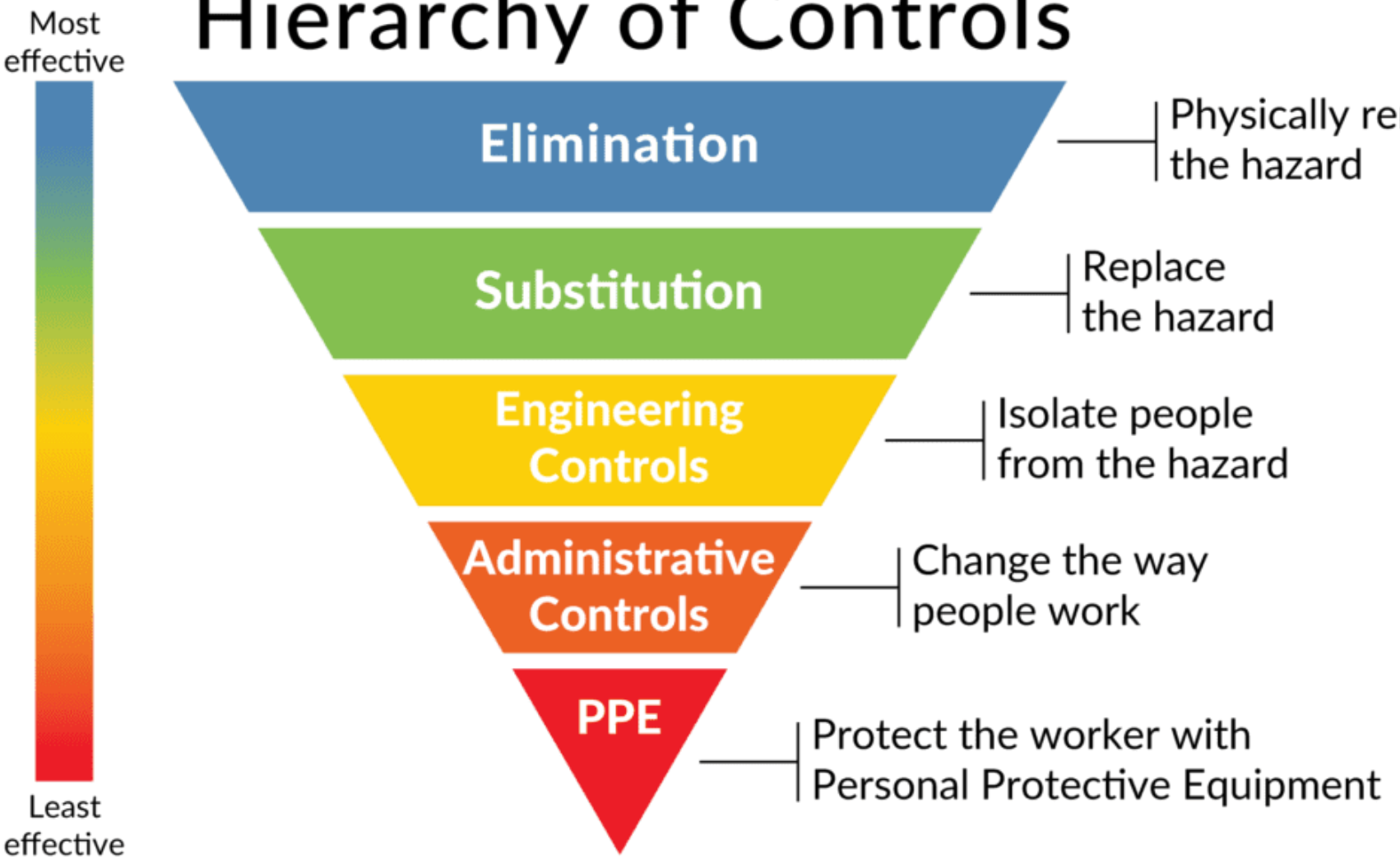
Event on Long Island last week

- Nassau County Police Officers responded to a 911 call for an aided at a medical provider facility.
- Upon arrival, officers were informed that a male, 61, entered an unauthorized Magnetic Resonance Imaging (MRI) room while the scan was in progress.
- The male victim was wearing a large metallic chain around his neck causing him to be drawn into the machine which resulted in a medical episode.
- The Nassau County Police Department responded to assist the aided where he was transported to a local area hospital. He was listed in critical condition.
- The above listed victim succumbed to his injuries and was declared deceased by a hospital physician on Thursday, July 17, 2025 at 2:36 p.m.

BNL Static Magnetic Field Subject Area

Step 1	Line organizations identify the devices within the work area that produce static magnetic fields. See Guidance on Sources of NIR & SMF in the ESH Guide: Non-ionizing Radiation.
Step 2	Line organizations contact the Environment, Safety and Health Representative (ESHR) to perform magnetic field evaluations, calculations, or measurements that determine worker exposure potential. Have the exposure assessments revised if: •Modifications or equipment upgrades result in increased or decreased personnel exposures to magnetic fields, •Previously undocumented devices are found, or •New applications or devices are introduced into an area. ESHR records the exposure assessment in the 851 Baseline database in the Hazard Validation Tool.
Step 3	When changes occur in exposure potential, line organizations update applicable Work Planning and Control documents as per the Work Planning and Control Subject Area.
Step 4	Line organizations identify workers, users, and guests who will enter areas ≥ 0.5 mT (5 Gauss) and have them complete the SMF Questionnaire (Medical Protocol for Static Magnetic Fields) and send it to the OMC at Building 490. This Questionnaire enables OMC to determine those with implanted ferromagnetic or electronic medical devices who should not enter fields > 5 Gauss. Supervisors indicate ≥ 0.5 mT (5 Gauss) on the worker's Occupational Medicine Clinic Job Assessment Form. Contact OMC x3670 if needed for instructions.
Step 5	When an area has the potential for whole body exposure ≥ 0.5 mT (5 Gauss), line organizations inform those entering the area that persons with implanted ferromagnetic or electronic medical devices should not be exposed. Use one or more of the following methods: •Signs, procedures, or oral instructions. •Planning tour routes with short-term visitors to avoid areas with fields ≥ 0.5mT or informing those on tours that pass into areas ≥ 0.5 mT, that they should exclude themselves from that portion of the tour.
Step 6	When advised by the ESHR that workers or the general population will be exposed above the occupational exposure limit, line organizations control worker exposure by one or more of the following: •Feasible engineering and administrative controls to reduce exposure to acceptable levels. See the Guidelines section below. •Warning signs per the exhibit Safety Signs for Static Magnetic Fields for fields: • ≥ 0.5 mT (5 Gauss) whole body exposure (medical device wearers); • ≥ 2T (20,000 Gauss) whole body exposure (general workplace); • ≥ 8T (80,000 Gauss) whole body exposure (special training); and/or • ≥ 20T (200,000 Gauss) limbs. •Work permits, standard operating procedures, or other documentation to conduct operations in a manner that minimizes exposures.
Step 7	Supervisors ensure that personnel assigned to work in fields with whole body exposure ≥ 2 Tesla (20,000 Gauss) complete either the Static Magnetic Fields web-based training located on the BNL Training and Qualifications website or an equivalent departmental training course approved by the Static Magnetic Field SME. Repeat training every three years.
Step 8	When advised by an ESHR that a person has been exposed above an occupational exposure limit, line organizations: •Send the person to the Occupational Medicine Clinic for medical evaluation; and •Contact an ORPS Occurrence Categorizer.

Hierarchy of Controls



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Common Hierarchy of Controls for Magnetic Field Safety

Engineering Controls:

- Access Control System

Administrative Controls:

- Magnetic Field Measurements
- Magnet Area Inspections
- Medical Surveillance
- Signs and Markings
- Work Control
- Training
- Escort Procedure

Work Control Example

- Work Control Scenario:
  - Workers called to facility to perform maintenance work on cooling systems;
  - Work location requires the use of a scissor-lift to reach
  - Work location is in vicinity of strong magnet
- Can this work be performed safely in this location with the magnet energized?
- Could the work be rescheduled,

  or,
- Can the Magnet be deenergized?
- What is the significance of 5 Gauss?
- SCoR Principles:
  - Worker Raised Question;
  - Hazards are Identified for Every Task, Every Time

“Facility or Area” Hazards

Hazards that can affect ALL persons in a space

Examples:

- Ionizing Radiation
- Non-Ionizing Radiation
- Lasers
- Magnetic Fields
- Noise
- Hazardous Atmosphere

Awareness-
Signs Placards and Labels

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