

MRI/NMR Safety

POLICY

Due to the high magnetic field, fighting fires in a suite with an MRI or NMR unit pose an additional hazard. The following procedures should be followed in the event of a fire in the suite in order to prevent additional hazards to the individual or facility.

RESPONSE TO A FIRE

- A. If you discover a fire, follow this order of response:
 - 1. Rescue
 - 2. Alert
 - 3. Confine
 - 4. Extinguish

- B. In trying to extinguish or contain the fire, do not jeopardize your own safety. Do the following:
 - 1. Disconnect electrical power to the MRI or NMR system by pressing the emergency “off” buttons.
 - 2. Use only a non-magnetic extinguisher.
 - 3. If the fire is not extinguished after emptying the available extinguisher, or if your safety is endangered, remove the magnetic field by pressing a “quench” button or the Emergency Rundown Unit.
 - 4. Screen all personnel, including firefighters, for entry to the restricted magnetic field area.

- C. If a fire breaks out in the computer room:
 - 1. Disconnect electrical power by pressing the emergency “off” buttons.
 - 2. If the fire is not extinguished after you have emptied the fire extinguisher, or if personnel are endangered, evacuate the room and manually activate the whole-room halon fire extinguisher. If this extinguisher goes off automatically, evacuate the room immediately.

SAFE HANDLING OF LIQUID HELIUM AND LIQUID NITROGEN

- A. Read MSDS sheet before working with cryogenic materials.

- B. In their liquid states, helium and nitrogen are extremely cold and will freeze human tissue. Only authorized persons should fill liquid nitrogen and liquid helium containers. Use protective cryo-gloves. Injuries caused by freezing must be washed with water and treated as burns.

- C. When they evaporate, helium and nitrogen form a cold mist. Helium rises, and nitrogen descends to ground level. While these gases are odorless, non-flammable, and non-poisonous, they pose the risk of

suffocation because they dilute the oxygen in the air. Always keep the ventilation running in the emanation room and the storage room and the storage room for liquid gases.

- D. Never transfer liquid helium or liquid nitrogen into the magnet before the quench pipe exhaust is installed.
- E. Use only containers made of non-ferrous material in the magnet area. Ferrous containers are extremely dangerous to personnel and equipment. Special non-ferrous containers are available from liquid gas suppliers; they should be specified, and will be labeled as such.
- F. Remove all jewelry from hands and wrists. If skin comes in contact with cryogenics, run the affected area under lukewarm water for 15 minutes. DO NOT rub the affected area.
- G. If injured notify your supervisor as soon as possible. If non-emergency medication is needed, go to Campus Health Services located at HCOC 1st floor on Health Science Campus, or Cardinal Station on Belknap Campus.
- H. In the case of EMERGENCIES call 911 if a large quantity of cryogenics is spilled, quench occurs, someone is severely burned, or if there is a fire.

Note: MRI and NMR systems with a superconductive magnet come equipped with a quench pipe, which prevents evaporation of nitrogen and helium into the room containing the unit.