

York MRI Facility

Standard Operating Procedure #41-01

Emergency Fire Procedure

1. Introduction

- 1.1. Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths present unique hazards to both research subjects and individuals working within and around the MRI system. Consequently, the potential for serious personal injury is present due to the sheer size and strength of the static magnetic field along with the flexibility of the research system and associated peripheral hardware.
- 1.2. The static magnetic field in the 3T MRI facility is always present. It is important that all those entering the facility be aware of the presence of the field, as it cannot be detected in any way, i.e. magnetic fields cannot be felt, seen or smelled. Ferromagnetic objects brought into the magnet room could quickly become dangerous projectiles, and the magnetic field can also interfere with the operation of certain medical implants.
- 1.3. Working within and around the high field MRI requires in depth training on safety and Standard Operating Procedures, and documented proof of other necessary training. See SOP #30-01 "Safety Training Procedures".
- 1.4. It is imperative that all personnel who are within and around the 3T MRI Facility always keep in mind the potential safety risks, and act in accordance with the guidelines set out in the Standard Operating Procedures.

2. First Signs of Potential Fire

- 2.1. There are signs of a potential fire present before a fire occurs. Operators need to be aware of the signs to prevent injury to the volunteer/patient and other experimental support personnel in the magnet room, equipment room and the control room during a scan.
- 2.2. The first sign of a potential fire is often an irregular noise, for example a loud popping sound or a sudden stop of the gradients. It is imperative that the operator determine the cause of the irregular noise before continuing with the scan session.
- 2.3. The second sign of a potential fire is often a subtle detection of an odour.
- 2.4. The third sign of a potential fire is small amounts of smoke. There may not be enough smoke to set off the detector or the automatic fire suppression system, so it is important to always be aware of the possibility of the presence of smoke. If anyone in the control room, equipment room or the magnet room notices smoke, even if the smoke detector alarm is not sounding, the procedure below must be followed.
- 2.5. The final case is one in which the smoke detector has gone off and an alarm is sounding in the magnet room.
- 2.6. In each of the above circumstances the operator must:

- 2.6.1. Immediately STOP the scan (if in progress).
 - 2.6.2. Shut-down the electrical power to the MRI equipment by pressing one of the red electrical stop buttons labeled “EMERGENCY STOP SIEMENS EQUIPMENT”.
They are located:
 - 2.6.2.1. On the wall to the right of the operator console,
 - 2.6.2.2. Immediately to the left after entering the magnet room,
 - 2.6.2.3. Immediately to the right after entering the equipment room.
 - 2.6.3. Remove the volunteer/patient from the scanner.
 - 2.6.4. Investigate the source of the irregular noise, odour or smoke.
 - 2.6.5. Close the magnet room door.
 - 2.6.6. Immediately notify the Facility Director or Safety Officer.
- 2.7. It is important to keep in mind that any smoke or odour caused by heat can contain chemicals that are harmful if inhaled. Limit your exposure and close the magnet room door to prevent the noxious fumes from permeating the rest of the building.

3. Emergency Fire Procedure

- 3.1. Remember to use common sense! There are three basic steps to follow:
 - 3.1.1. Ensure your own safety.
 - 3.1.2. Ensure the safety of others in the facility.
 - 3.1.3. Contain the fire if possible. If it is not possible to contain the fire, follow the procedure in section 4 “Emergency Fire Procedure for Uncontrollable Fires”.
- 3.2. Shut-down the electrical power to the MRI equipment by pressing one of the red electrical stop buttons labeled “EMERGENCY STOP SIEMENS EQUIPMENT” (this will NOT quench the magnet). They are located:
 - 3.2.1. In the Control Room, on the wall to the right of the operator console,
 - 3.2.2. Immediately to the left after entering the magnet room,
 - 3.2.3. Immediately to the right after entering the equipment room.
- 3.3. Remove the volunteer/patient from the scanner.
 - 3.3.1. There will not be power to the bed because the electrical stop button was pushed, so the bed must be withdrawn manually.
 - 3.3.2. Pull the Emergency Release located under the support frame of the bed to unlock the clutch, and pull the bed out manually.
 - 3.3.3. If the volunteer/patient is not responding, not breathing or is in respiratory or cardiac distress, follow the procedure set out in SOP #40-01 “Medical Emergency Procedure”.
- 3.4. Contain the fire.
 - 3.4.1. The automatic fire suppression system will only activate if there is sufficient heat and smoke being emitted by the fire. If the sprinklers have not yet activated and it is safe to do so, use the non-magnetic fire extinguisher to put out the fire. The non-magnetic fire extinguisher is located to the left as you enter the control room. Only trained individuals should operate a fire extinguisher.
 - 3.4.2. If there are flames that are not being extinguished by the non-magnetic fire extinguisher, exit the magnet room and pull the fire alarm in the control room to the right of the magnet room door. It reads, “LIFT & PULL TO ACTIVATE PRE-ACTION

SPRINKLER SYSTEM". Activation of this pull station will flood the lines with water and will activate the building fire alarm. When there is sufficient heat and smoke the sprinkler heads will begin to spray water.

3.4.3. If the fire has not been contained by the non-magnetic fire extinguisher or the automatic fire suppression system, proceed to Section 4. "Emergency Fire Procedure for Uncontrollable Fires".

3.5. Close the magnet room door.

3.6. Call York University Security Services at Ext. 33333 (416-736-5333) and explain that there was a small, controllable fire that has been extinguished in the 3T MRI, York MRI Facility in Sherman Health Science Research Centre.

3.7. Evacuate the building to avoid smoke or if the fire alarm is sounding.

3.8. Report the incident to the Facility Director or the Safety Officer.

4. Emergency Fire Procedure for Uncontrollable Fires

4.1. Always remember to:

4.1.1. Ensure your own safety.

4.1.2. Ensure the safety of the volunteer/patient in the magnet.

4.2. Follow steps 3.2 – 3.5 in section 3 "Emergency Fire Procedure".

4.3. If the fire cannot be contained using the non-magnetic fire extinguisher and it has not been extinguished by the automatic fire suppression system, close the magnet room door and Quench the magnet following SOP #42-01 "Emergency Quench Procedure".

4.4. From a safe place call 911, and then notify York University Security Services at Ext. 33333 (416-736-5333). York Security services will help guide the Fire Department to the correct location.

4.5. Evacuate the building, and pull the fire alarm if it is not already sounding. There is a pull station located in the Control Room to the right of the magnet room door, as well as at each exit.

4.6. Meet York Security and/or the fire department at the exterior door.

4.6.1. Give them details regarding the incident including the specific location of the fire and whether or not the magnet has been quenched.

4.6.2. If the magnet has not been quenched the fire fighters must be informed that the magnet is still at field. The fire fighters must not enter the magnet room with their gear donned; doing so could cause serious injury to themselves or anyone near the magnet at the time.

4.6.3. If the fire fighters deem it necessary to enter the magnet room with their gear donned, the magnet must be quenched following SOP #42-01 "Emergency Quench Procedure".

4.6.4. Inform the fire department that there are plastic bottles (phantoms) containing nickel sulfate in the southwest corner of the magnet room. The phantom fluids may produce nickelous aerosols.

4.7. Notify the Facility Director or Safety Officer immediately following the incident.