

**STANDARD OPERATING PROCEDURE:**  
**MRI SYSTEM SHUTDOWN**

**1. INTRODUCTION**

- 1.1 Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths presents unique hazards to individuals working within and around the MRI system. The potential for serious personal injury is present due to the sheer size and strength of the static magnetic field along with the immense flexibility of the research system and associated peripheral hardware.
- 1.2 There exist dangerous and potentially lethal levels of electricity in the 9.4T MRI system. As such, it is important that all individuals working around the MRI system be aware of the dangers and safety issues concerning electricity. Current carrying cables, connections and junction points in the vicinity of the main magnetic field are particularly susceptible to damage due to the extreme Lorentz forces created through the normal operation of the system. Periodically, the effects of prolonged mechanical fatigue will result in breakage causing electrical arcing, sparking and high heat levels before the system can shut down. There is therefore a high potential for personal injury and the possibility of a fire being ignited.
- 1.3 Equipment in the 9.4T MRI Facility is sensitive to the order used in powering the system up and down. If the proper procedures are not followed, the equipment may be damaged. Only qualified operators are to perform the following procedure.
- 1.4 Training is required before any procedure involving the MRI equipment is attempted. See SOP#200-01 "Safety and Training of Personnel".

**2. SHUTDOWN PROCEDURE**

- 2.1 If you are unsure of any of the steps in the following procedure, DO NOT CONTINUE. Immediately contact the Head Technician or the Facility Manager.
- 2.2 Turn off the gradient power amplifiers.
  - 2.2.1 Press the red INHIBIT buttons on each amplifier. The LEDs in the middle of the INHIBIT buttons should be illuminated.
  - 2.2.2 Put the power switch in the off position.
  - 2.2.3 Put the Heavy Duty Safety switch in the off position.
- 2.3 Turn off the RF amplifiers.
  - 2.3.1 Put the switches located on the front of the amplifiers in the off position.
  - 2.3.2 Put the main power switch in the off position. This switch is located on the power distribution unit and is accessible from the back of the RF amplifier bay.
- 2.4 Turn off the console.
  - 2.4.1 Turn off the shim power supply. The switch is on the back of the left bay of the console.
  - 2.4.2 Turn off the console power supply. The switch is on the front of the right bay of the console.
  - 2.4.3 Turn off the main power. The switch is on the back of the right bay of the console.

- 2.5 Turn off the RF Front End. The switch is located above the hole through which the cables enter the RF Front End.
- 2.6 Close the valve on the chiller and place the power switch of the chiller in the off position.
- 2.7 The system should be off at this point.

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ROBARTS RESEARCH INSTITUTE  
CENTRE FOR FUNCTIONAL AND METABOLIC MAPPING  
9.4T MRI FACILITY

SOP#315-03

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*SOP Approval Signatures*

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Dr. Greg Dekaban, RRI Biosafety Officer

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Date