



3T/7T MRI FACILITY

SOP Number:	300.03
Title	3T MRI System Start-Up and Shutdown

Revision Chronology		
Version Number	Date	Changes
300.01	01 March 2010	New
300.02	21 January 2013	Updated procedures
300.03	27 October 2015	Review

Associate Director Signature: _____

Date: _____

ROBARTS RESEARCH INSTITUTE
CENTRE FOR FUNCTIONAL AND METABOLIC MAPPING:
3T MRI FACILITY

Standard Operating Procedure #300.03

3T MRI System Start-Up and Shutdown

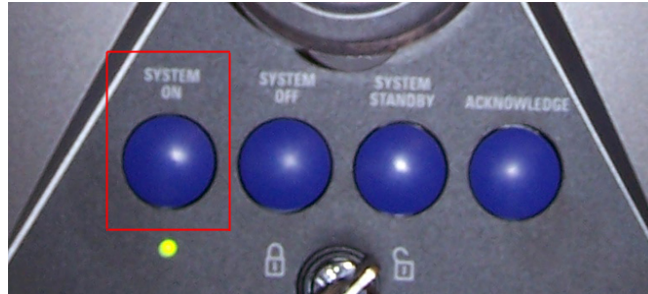
1. Introduction

- 1.1 Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths presents 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 magnitude and strength of the static magnetic field along with the immense flexibility of the research system and associated peripheral hardware.
- 1.2 Dangerous and potentially lethal levels of electricity are used by both the 3T and 7T MRI systems. Therefore it is important that all individuals working around the MRI systems be aware of the dangers and understand the 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 may result in breakage, thereby causing electrical arcing, sparking, and high heat levels before the system can shut down. In these instances there is a high potential for personal injury as well as the possibility of a fire being ignited.
- 1.3 Equipment in the 3T 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 or malfunction. Only authorized Level 2 MRI Personnel are permitted to perform these procedures.
- 1.4 Extensive training is required before performing any procedure on the 3T MRI system, see SOP#130: "MRI Personnel Training".

2. 3T Start-Up Procedure

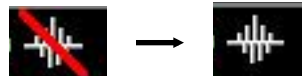
- 2.1 If you are unsure of any of the steps in the following procedure, DO NOT continue. Contact the Facility Manager immediately.
- 2.2 The Start-Up procedure is the same for both the Powered Down and Standby states.
- 2.3 **IMPORTANT:** In the event that there is power loss to the entire MRI system or one of the emergency electrical shutdown buttons has been depressed, DO NOT proceed any further. Contact the Facility Manager immediately.
- 2.4 Start-Up Procedure:
 - 2.4.1 Press the **SYSTEM ON** button located on the Siemens wall control panel in the MR console room.

- 2.4.1.1 Do NOT plug or unplug any RF coils, move the bed, or open any Syngo application (e.g. Neuro3D) while the system is booting. This may cause system errors and may necessitate a system reboot.
- 2.4.1.2 Note that the system takes approximately 20 minutes to boot.



SYSTEM ON button

- 2.4.2 When the system is fully operational, ALL of the following will occur:
 - 2.4.2.1 You will hear **3 gradient knocks** from the magnet.
 - 2.4.2.2 A “**System Online**” message will appear in the Magnet Status window.
 - 2.4.2.3 The **red line** will disappear from the Magnet Status icon.



- 2.4.3 The system is now booted and ready to scan.
 - 2.4.3.1 Note that the system boots to a basic operational state. To gain full access to system, including use of all Windows functions and programs, you must login as an Advanced User.
 - 2.4.3.1.1 Advanced User Login Procedure:
 - 2.4.3.1.1.1 Press **Ctrl + Esc** to open the Windows Start Menu.
 - 2.4.3.1.1.2 From the **Programs** menu, select **Advanced User**.
 - 2.4.3.1.1.3 A new window will open prompting for the Advanced User password.
 - 2.4.3.1.1.4 Contact MRI Technologist or Facility Manager for password.
 - 2.4.3.1.1.5 A confirmation message will appear stating: “Advanced usage is enabled.” Click on **OK**.

2.4.3.2 Occasionally the system will not boot properly, either due to the system not being shut down properly or internal system errors. In these instances you will NOT hear the 3 knocks from the magnet or receive the “System Online” message in the Magnet Status window. The red line will remain on the Magnet Status icon, and when clicked, will display the system error(s) that occurred.

2.4.3.2.1 If the system does boot properly, a full system shutdown and restart is required. Proceed with the “3T Shutdown Procedure” in Section 3.

3. **3T Shutdown Procedure**

- 3.1 If you are unsure of any of the steps in the following procedure, **DO NOT** continue. Contact the Facility Manager immediately.
- 3.2 In Syngo on the host PC, select: **System → End Session**.
 - 3.2.1 A window will open with the following options:
 - 3.2.1.1 Log Off
 - 3.2.1.2 Shutdown System
 - 3.2.1.3 Restart System
 - 3.2.1.4 Restart Application
 - 3.2.2 Select **Shutdown System**.
 - 3.2.3 A verification window will pop up with the message: “Do you really want to shut down the system?” Click on “**Yes**”.
- 3.3 Wait for the message: “It is now safe to turn off your computer”.
- 3.4 Press the **SYSTEM OFF** button on the Siemens control panel.



***SYSTEM OFF** button*

- 3.5 The system should be OFF at this point.