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

SOP#325-02

STANDARD OPERATING PROCEDURE: EMERGENCY QUENCH PROCEDURE

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 The static magnetic field in the 9.4T 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 by our person in any way, i.e. magnetic fields cannot be felt, seen, or smelt.

1.3 As a result of the potential for serious injury, access to the 9.4T MRI Facility is restricted, and requires permission. See SOP#100-01 "Facility Access" and SOP#105-01 "Visitor Approval".

1.4 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#200-01 "Safety and Training of Personnel".

1.5 It is imperative that all personnel who are within and around the 9.4T 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. DESCRIPTION OF A QUENCH

2.1 A "quench" is an event that occurs only in superconducting magnets. It is a loss of superconductivity (i.e. a rapid increase in the resistance of the magnet coil windings). This process generates heat that results in the rapid evaporation, or boil-off, of the magnet coolant (liquid helium). This evaporated coolant is a hazard and must be immediately vented (through the quench pipe). NOTE: once initiated, a quench cannot be stopped and can potentially cause total magnet failure.

2.2 There are 2 situations in which a quench may occur.

2.2.1 Spontaneously due to some force or disruption to the magnet system.
2.2.2 The emergency quench button is depressed during an emergency situation.

3. SPONTANEOUS QUENCH

3.1 In the event of a spontaneous quench, the operator should take the following steps:

3.1.1 Abort the current acquisition.

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3.1.2 Evacuate the magnet room.
3.1.3 Close the doors leading into the magnet room.
3.1.4 Notify the Facility Manager or Director, and UWO Emergency Dispatch (x88911), immediately following the incident. The facility staff must then file an appropriate Robarts incident report of the situation.

4. DEPRESSING THE EMERGENCY QUENCH BUTTON

4.1 The emergency quench button must be pressed if there is a fire in the magnet room that cannot be contained using the non-magnetic fire extinguisher and requires the assistance of the fire department. Refer to SOP#330-02 "Emergency Fire Procedures" for the emergency fire procedures.

4.2 The emergency quench button must be pressed if any individual is trapped or pinned to the magnet by a non-removable ferrous object.

5. EMERGENCY QUENCH PROCEDURE

5.1 Evacuate the magnet room.

5.2 Depress the emergency quench button. It is located beside the operator's computer in the console room. There is another quench button on the Emergency Discharge Unit. This unit is sitting on top of the gradient power amplifier.

5.3 Evacuate the magnet room.

5.4 Close the doors leading into the magnet room.

5.5 If the magnet was quenched because someone was pinned, and they are injured, the operator must apply first responder principles. Once all parties are safely out of the magnet room, close the magnet room door.

5.6 Notify the Facility Manager or Director, and UWO Emergency Dispatch (x88911), immediately following the incident. The facility staff must then file an appropriate Robarts incident report of the situation.

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SOP Approval Signatures

_____	_____
Dr. Robert Bartha, Facility Director	Date
_____	_____
Dr. Greg Dekaban, RRI Biosafety Officer	Date
_____	_____
Ron Noseworthy, RRI Occupational Health & Safety Officer	Date