



SOP Number:	215.12	
Title:	Emergency Quench Procedure	
Version Number	Effective Date	Changes
215.12	17 August 2023	Reviewed

Directors Signature: _____ *Jim Skoep* _____ Date: 2023/SEP/01

1. SCOPE

This SOP describes the procedure to be followed in order to quench the magnet in the event of an emergency in the 3T MRI facility.

2. PROCEDURES

a. Description of a quench

- A “quench” is a **serious** event that occurs only in superconducting magnets. It is caused by loss of superconductivity; a rapid increase in the resistivity of the magnet coil windings, which generates heat. This results in the rapid evaporation, or boil-off, of the magnet coolant (liquid helium). This evaporated coolant is a hazard that requires emergency venting systems (quench pipe through roof) to protect patients and operators. **NOTE:** once initiated a quench cannot be stopped and can potentially cause total magnet failure.
- There are two situations in which a quench may occur.
 - Spontaneously: due to some force or disruption to the magnet system.
 - Intentional Quench: when the emergency quench button is depressed during an emergency.

b. Spontaneous Quench

- In the event of a spontaneous quench:
 - Immediately abort the scan.
 - Evacuate the magnet room.
 - Close the magnet room door.
 - Notify the MRI facility manager or facility director immediately following the incident. The facility staff must then file an appropriate incident report of the situation.

c. Emergency Quench

- The emergency quench button **MUST** be depressed in cases where an individual is pinned to the magnet, trapped, or in a potentially life-threatening situation by a **non-removable** ferrous object.

d. Emergency Quench Procedure

- Prop magnet room door open (with door stop). This will ensure a safe exit in the event of positive pressure in the magnet room once quench is activated.
- Depress the emergency quench button. It is located beside the “emergency off button” on the far-left wall of the magnet room under a hinged Plexiglas cover shown in Figure 1.
- Evacuate the magnet room.



Figure 1. Quench Button

- If the magnet was quenched because someone was pinned, and they are injured, the operator must apply first responder principles. If the victim is not responding, not breathing and has no pulse, follow the procedure outlined in SOP #205 *Emergency Code Blue Procedure*.
- Once all parties are safely out of the magnet room close the magnet room door.
- Notify the 3T MRI facility manager or 3T MRI facility director and Robart’s security (ext. 24041) immediately following the incident. The facility staff must then file an appropriate incident report of the situation.

e. Emergency Evacuation Release Tool

- If the emergency quench button fails for any reason, then the “Emergency Evacuation Release Tool” **must** be used to quench the magnet.
- It is important to note that the use of this method could damage the magnet permanently, and therefore should be attempted only after the emergency quench button has been depressed (unsuccessfully).
- The “Emergency Evacuation Release Tool” can be found on the windowsill in the console room as shown in Figure 2.1.

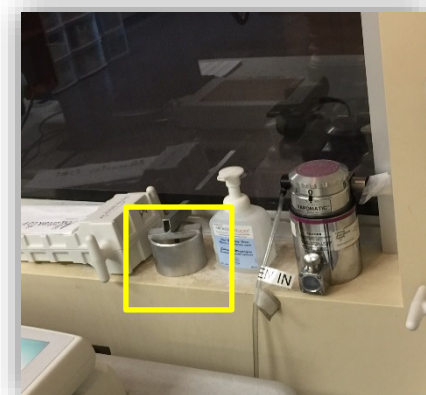


Figure 2.1 Emergency Release Tool

- Figure 2.2 below shows the step-by-step procedure on how to use the release tool in the event of an emergency quench.

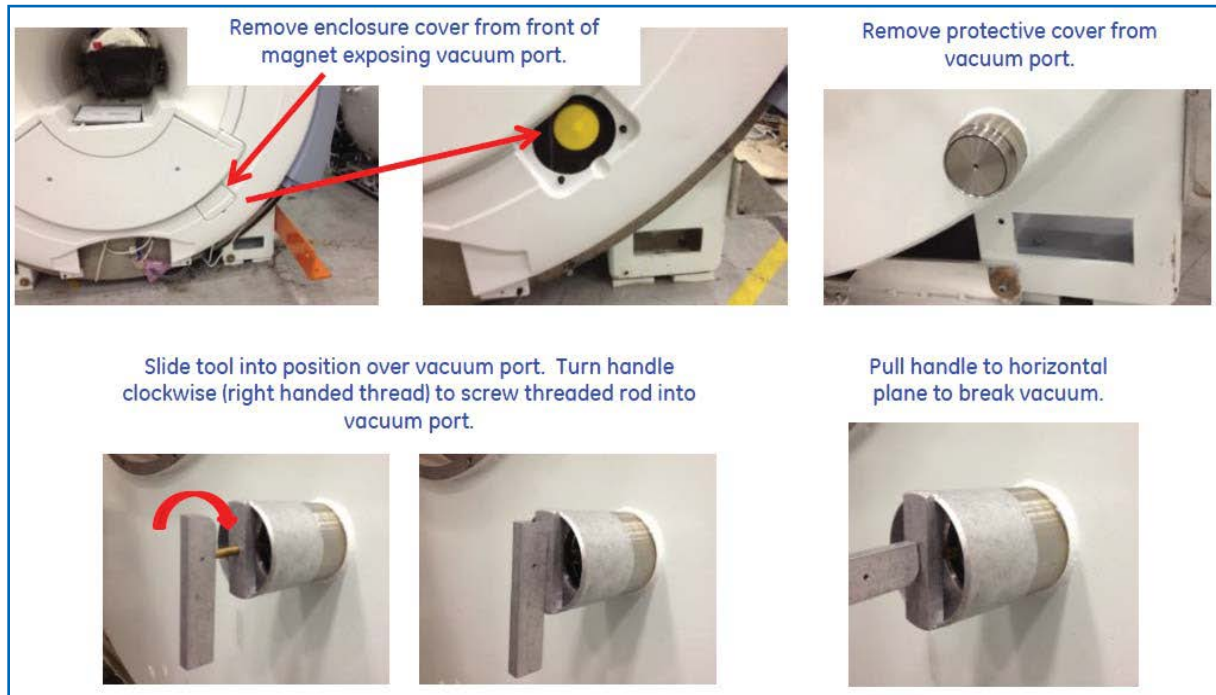


Figure 2.2 Emergency Release Tool Procedure

f. Robarts Research Institute Accident/Incident Investigation Report

This form can be accessed [here](#)

Paper copies are available at the back of section 8 of the 3T MRI SOP Binder.