

1 Scope:

This test is used to determine magnet turn-to-turn coil insulation integrity by stressing the magnet coils with approximately 50-100 Volts between turns. This is done by applying a 2 kV pulse to the coils. The application of this test should not be repeated any more than necessary to avoid over-stressing the insulation. Inductance, Q, and DC resistance tests are normally done before and after the impulse test to confirm that no damage has occurred to the coil(s).

2 Applicable Documents:

RHIC-MAG-Q-1000 Control of Measurement Test Equipment
RHIC-MAG-Q-1004 Discrepancy Reporting Procedure
Data Sheet - RHIC Impulse Testing

3 Requirements:

3.1 Material /Equipment:

Appropriate BNL impulse generator (2 kV max).

Computerized data acquisition system.

3.2 Safety Precaution:

3.2.1 Impulse testing poses a class "C" electrocution hazard. At least two properly trained technicians must be present to perform this testing. When testing, a trained technician shall be stationed at any point where the item under test is accessible to unauthorized people, and barriers shall be set up. Signs shall be posted reading "DANGER HIGH VOLTAGE" and warning lights shall be turned on. The area shall be dry and clean and equipment /cables in good order prior to testing.

3.2.2 The technician is responsible for notifying his supervisor and/or the cognizant engineer of any discrepancies noted during the performance of this procedure. All discrepancies shall be identified and reported using the discrepancy reporting system.

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3.3 Procedure:

3.3.1 Make certain all the ON-OFF switches are in the OFF position.

WARNING

The "impulse tester" should never be operated without the grounding cables being correctly connected

3.3.2 Connect a grounding cable from the safety ground stud of the "Impulse Tester" to a good electrical ground and connect a grounding cable from the yoke of the magnet under test to a good electrical ground making sure these connections are secure at both ends. It is essential that these connections be made.

3.3.3 Connect the output leads of the "impulse generator" (red & black, checking that black is the ground lead) across the main leads of the magnet coil under test.

3.3.4 Ensure safety barriers are set up and signs are posted and position the ON-OFF switch on the Impulse panel to ON.

3.3.5 Position the high voltage ON-OFF switch on the power supply to ON and make sure the power supply is in the remote mode and reset. The computer will set up the power supply and charge the impulse generator automatically going through the 500 to 2000 volts steps.

3.3.6 Using the computer mouse, "click" on the start test to initiate the testing cycle. Observe the waveforms for any abnormality and abort the test if anything looks wrong. The computer will pass the coil under test if the correlation is 0.98 or greater, 1.00 is a perfect match to the calibration coil waveform stored in the computer.

3.3.7 Repeat the above steps for any additional coils to be tested, making sure to "select" the new coil name for each test run.

3.3.8 When finished testing, place ON-OFF switches to the OFF position and disconnect all test leads.

3.3.9 Remove any safety barriers and signs.

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4 Quality Assurance Provisions:

4.1 The Quality Assurance provisions of this procedure require that the technician shall be responsible for performing all assembly operations in compliance with the procedural instructions contained herein and the recording of the results on the production traveler.

4.2 The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with RHIC- MAG-Q-1004.

4.3 Measuring and test equipment used for this procedure shall contain a valid calibration label in accordance with RHIC-MAG-Q-1000.

5 Preparation for Delivery:

N/A