

HINS 325 MHz RF Component Test Cage Operating Procedures

RF power testing of component in the Cage shall be done only within the scope of an approved written RF Test Program Proposal which must be readily available to the RF operator at all times while the respective tests are being conducted.

325 MHz RF System operations for component testing shall be attended at all times by a qualified 325 MHz RF operator and by a member of the test team identified in the respective Test Program Proposal. If the RF operator and test team member is the same person, a second person from either group is required. Two persons shall be present at all times that RF power is being delivered to the Cage for component testing.

A. Accessing the 325 MHz RF Component Test Cage

- 1) A trained, authorized person, acting in the role of lead authorized employee, must perform “325 MHz RF Power Distribution System LOTO Procedure”, ADDP-RF-7902 prior to any access to the Cage.
- 2) Each person who enters the Cage to install, remove, or work on any RF component connected to the RF power system must perform LOTO following the lead authorized person in Step 1 above.

For any person without LOTO Level 2 training, this becomes a “supervised LOTO” procedure. Regarding supervised LOTO, the Fermilab ES&H Manual states “If the subject individual is an employee, he or she will be scheduled for the earliest available LOTO Level 2 training.”

- 3) RF Cage Enter Key is obtained from the 325 MHz RF Permit/Switch Control chassis in Rack PD-R6 or from the key tree in Meson Control Room.
- 4) Use Enter Key to unlock cage door.

B. Installation and Cage Housekeeping

- 1) Items to be tested and all associated components must be installed according to generally accepted good electrical and mechanical practices.
- 2) The Cage must be kept in a clean and orderly condition at all times.

C. Exiting and Re-Securing the RF Cage

- 1) The RF power system in the Cage must be left in a secure state, properly terminated by an approved 'device for test' or a suitable blank-off.
- 2) A trained, authorized person must search and secure the Cage according to the Cage search and secure procedure.
- 3) The RF Cage Reset Key should then be returned to the key tree in Meson Control Room or retained by the RF operator if another access is anticipated in a short time.
- 4) The RF Cage Enter Key should be returned to the 325 MHz RF Permit/Switch Control chassis in Rack PD-R6 if operation is imminent or to the key tree in Meson Control Room if current operations are completed.
- 5) The "325 MHz RF Power Distribution System LOTO Procedure" 'return to service' steps may then be executed.

D. Transmitting RF Power to the Cage

The normal position state of the waveguide shutter is closed except when intentionally transmitting RF power to the Cage within the context of an approved RF Test Program proposal.

Preparation

- 1) Verify that waveguide switch is directed to test station.
- 2) Verify that the RF distribution system is configured so as to prevent RF power delivery to the 325 MHz Cavity Test Cave.
- 3) Turn on modulator and klystron to required power levels per Test Program.
- 4) Verify that RF power level required for respective test program is observed on the forward and reflected power signals from the directional couplers upstream of the waveguide shutter.

Transmitting Power for Tests

- 1) Turn off RF drive to klystron, stop modulator pulsing.
- 2) Open waveguide shutter.
- 3) With consent of test team representative, turn on modulator and RF drive to klystron.
- 4) Operate to perform tests within conditions of approved test program.
- 5) Turn off RF drive to klystron, stop modulator pulsing

Ending Tests

- 1) Turn off klystron and modulator.
- 2) Close waveguide shutter and lock shutter in closed position.
- 3) RF power system in the Cage must be left in a secure state, properly terminated by an approved 'device for test' or a suitable blank-off.