


	ESH Section Procedures	
Procedure Number/Name ESH-RPE-INTLK-2119 – MTA CDC Test Procedure	Revision Number: 5	
Written by: Glenn Federwitz	Revision Date: 7/16/2020	

MTA CDC Test Procedure

REVIEWED BY  DATE 9/8/2020
 ESH Section Assigned Radiation Safety Officer

REVIEWED BY  DATE _____
 ESH Section Interlock Engineer

APPROVED BY  DATE _____
 ESH Section Radiation Physics Engineering Department Head

Revision History

Revision Number	Author	Description of Change	Revision Date
4	J. Federwitz	Reformatted (now ESH&Q procedure)	10/26/2017
5	G. Federwitz	Changed MuCool to MTA and removed the Reprate monitor. See Change Request #254	8/26/2020

Table of Contents

1.0 Purpose and Scope.....1
 2.0 System Testing Approach.....1
 3.0 Marking Procedure.....1
 4.0 Modifications of Safety System Interlock Procedures.....1
 5.0 Reporting Non-conformance during use of Safety System Interlock Test Procedures.....1
 6.0 Critical Device Controller.....3

1.0 Purpose and Scope

The purpose of this procedure is to thoroughly test the MTA CDC Controller.

2.0 System Testing Approach

The majority of the system will be tested using an event / response relationship. This will be accomplished by causing a system violation and verifying that the system reacts correctly.

3.0 Marking Procedure

The Test Director shall document the results of safety system testing with the following colors:

- a. Red for system malfunction or failure;
- b. Blue for correct operation; or
- c. Green for editorial comments or changes in the procedure.

The Test Director shall document the results of safety system tests in the test record and ensure all test team members and test escorts sign the test record.

The test record is written with the response yes or no for each item tested. The test director shall circle the yes response for correct system operation or the no response for system malfunction or failure.

4.0 Modifications of Safety System Interlock Procedures

In the event of non-standard situations, the test director may deviate from the approved test procedure as long as the intent of the procedure is being followed. The test director shall document the deviation on the test procedure as stated above.

5.0 Reporting Non-conformance during use of Safety System Interlock Test Procedures

Tested items that fail during testing or which are found in an inoperable condition during the test will be replaced or repaired, documented, and fully retested prior to acceptance of the system.

MTA CDC

Date Tested _____

Test Director

_____ Date

Test Team

_____ Date

_____ Date

_____ Date

_____ Date

Accepted by:

_____ Date
ESH Section Radiation Physics Engineering Department Head

6.0 Critical Device Controller

6.1 Preparation Procedures

This section requires no preparation procedures for the test team personnel safety. All Critical Device Controller inputs need to be made up for the following tests.

6.2 Critical Device Controller Input Tests

Purpose

In this section, each input circuit to the critical device controller will be tested to ensure the critical device controller input summation A and B trip when the input circuit is interrupted.

Procedure

1. Insert the critical device controller test module.
2. Remove each input circuit independently confirming that the critical device permit is removed.

Module Input #	MTA CDC			
	CDC Input Summation A		CDC Input Summation B	
1A MTA ESS A	Yes	No		
1B MTA ESS B			Yes	No
2A MTA Radiation Monitors A	Yes	No		
2B MTA Radiation Monitors B			Yes	No

6.3 Critical Device Controller Failure Mode Test

Purpose

In this test, the critical device controller failure mode timers are tested.

Procedure

1. Interrupt each of the critical device status signals causing a critical device failure. Ensure the critical device failure mode permits trip in the allotted time. Ensure the Linac CDC receives an inhibit.

Module Input #	MTA CDC			
	CDC Failure Mode		LINAC CDC Inhibit	
CD 1 A Status (3 Seconds +/- 1 Second)	Yes	No	Yes	No
CD 1 B Status (3 Seconds +/- 1 Second)	Yes	No	Yes	No
CD 2 A Status (8 Seconds +/- 1 Second)	Yes	No	Yes	No
CD 2 B Status (8 Seconds +/- 1 Second)	Yes	No	Yes	No

2. Remove the CDC test module.

6.4 Critical Device Controller Output Test (E:UHB03 Contactor & E:UBS01)

Purpose

The tests in this section check the system operation from end to end. Besides verifying the critical devices for the MTA Beam Line E:UHB03 Contactor & E:UBS01 lose their permit with the removal of one of the MTA CDC inputs we will also verify the contactor for the E:UHB1 power supply (C-Magnet power supply) also will lose it's permit.

The tests in this section check the system operation from end to end and verifies proper inputs.

Note: For the listed input, ensure the critical devices are permitted and turned on.

Procedure

1. Verification of the MTA ESS to the MTA Critical Device Controller is done during the MTA ESS test procedure number ESH-RPE-INTLK-2116. This is done to resolve possible operational difficulties while testing the Critical Device Controller.
2. Trip a Radiation Monitor.

Did the Critical Device Controller Permit 1 trip and the E:UHB03 Contactor open?

Yes	No
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Did the E:UHB01 CDC Permit trip? (This is the Kicker power supply used as a beam permit device)

Yes	No
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Did the Critical Device Controller Permit 2 trip and UBS01 close?

Yes	No
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6.5 Conclusion

Purpose

The tests in this section are complete and the safety system needs to be returned to normal operating condition.

6.6 Critical Device Controller Test Module

Purpose

To ensure the Critical Device Controller Test Module used for testing the Critical Device Controller is returned and not left in the system.

CDC Test Module returned by: _____ Initial