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C-A OPERATIONS PROCEDURES MANUAL

4.120 Access Control Acceptance Tests

Text Pages 2 through 7

Attachments

**Hand Processed Changes**

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approved: \_\_\_\_\_ *Signature on File* \_\_\_\_\_  
Collider-Accelerator Department Chairman Date

V. Castillo

## 4.120 Access Control Acceptance Tests

### 1. Purpose

- 1.1 The purpose of this procedure is to define the common requirements which apply to all of the Access Control Acceptance Tests.
- 1.2 The Subsystems to be tested may include some or all of the following: Critical Devices (CDs), Gates, Crash Operators, Radiation Monitors (Chipmunks), Oxygen Deficiency Hazard (ODH), Programmable Logic Computers (PLC), and Flammable Gas Detection in the Experimental Areas. Particular operations tested include: Mode 24 (m24), Sweeps, and Power-Up of PLCs.

### 2. Responsibilities

- 2.1 Members of the C-A Department Access Control Group (ACG) shall, as designated:
  - 2.1.1 Conduct these test procedures on the Access Control System (ACS);
  - 2.1.2 Complete the verification boxes in the test procedures;
  - 2.1.3 Sign appropriate areas of the Test Procedures on the completion of testing;
  - 2.1.4 Document problems encountered during testing on Attachment 8.1, "ACS Trouble Log Tracking Sheet".
  - 2.1.5 Document repairs to the C-A Access Control System, implemented as a result of testing, in the ACS Maintenance Log Book;
  - 2.1.6 Inform the C-A ACG Leader of any failures found.
- 2.2 The C-A AC Group Leader shall:
  - 2.2.1 Ensure that these procedures are executed annually, or at such times as required by the Radiation Safety Committee (RSC), except for areas that are not scheduled to run for that FT (see C-AD Operations Schedule). These areas will be certified prior to their operating with beam and RSC approval to run..
  - 2.2.2 Review the test results and sign the completed test procedure.
  - 2.2.3 Report any as-found unsafe failures to the C-A Associate Chair for ESSHQ, or designee, and the Chairman of the RSC, or designee.

- 2.3 The RSC Chairman (or designee) shall:
  - 2.3.1 Review the test results and sign the completed test procedures.
  - 2.3.2 Determine if and when retesting is required, after changes in hardware or software have been implemented.

### 3. **Prerequisites**

- 3.1 All personnel involved in working on any electrical system or equipment in the C-A shall be familiar with [BNL SBMS Electrical Safety](#), [BNL SBMS Lockout/Tagout Implementation Plan](#), [C-A-OPM 1.5, "Electrical Safety Implementation Plan"](#), [C-A OPM 1.5.3 Procedure to Open or Close Breakers and Switches](#), [C-A-OPM 2.36 "Lockout/Tagout for Control of Hazardous Energy"](#). C-A will provide on-site/work specific training to individuals in the electrical safety aspects of their job functions and assignments.
- 3.2 Sources of radiation upstream of the area being tested shall be locked out and tagged according to Radiation Safety Lockout Tagout procedures.
- 3.3 The ACG Leader, or designee, is responsible for determining and documenting on RS LOTO Log Sheet, [C-A-OPM-ATT 9.1.16.b](#), all RS LOTO's that are needed for the tests being conducted.
  - 3.3.1 The Test Team Leader is responsible for verifying all RS LOTO's documented in 3.1 are implemented before the start of the testing process.
- 3.4 The Test Team Leader shall notify the C-A Operations Coordinator of the scope of the tests to be conducted.
- 3.5 The Test Team Leader shall notify the C-A Operations Coordinator of the start time of the tests to be conducted.
- 3.6 Before proceeding with these tests, the following conditions must exist:
  - 3.6.1 The development systems for both Division A & Division B must be disconnected and be under RS LOTO.
  - 3.6.2 The key switches on both Division A & Division B PLC computers must be in the "RUN" position, the keys removed and secured.
  - 3.6.3 The PLC enclosures must be closed and locked with an ACG padlock.

### 3.7 Minimum Personnel

3.7.1 A minimum of two members of the C-A ACG, who will work in the field are required. These members shall be designated “Testers”, and their qualifications and training requirements are:

- RWT-002, “RAD Worker 1”
- C-A Access Training
- Training in the use of a Personnel Oxygen Monitor (POM), as necessary.

3.7.2 One member of the C-A ACG is required to man the ACS Operator Interface in the MCR. This member shall be designated “Test Team Leader (TTL)” and shall be qualified to:

- Direct the test effort.
- Maneuver the ACS Operator Interface in the MCR.
- Document test results in the test procedure during the conduction of the test.
- Document problems encountered during testing on Attachment 8.1, “ACS Trouble Log Tracking Sheet”.
- Document repairs to the C-A ACS, implemented as a result of testing, in the ACS Maintenance Log Book.
- Apply/remove, or coordinate application/removal of, RS LOTO as necessary.
- Coordinate assistance of System Specialists from other C-A Sections when necessary.

### 3.8 Equipment required for the Testers:

- TLD badges
- C-A ACS access keys as required for testing
- C-A ACS entry cards as required for testing
- C-A Safety System padlock keys
- Technicians Tool Kit, including: voltage rated insulated tools , flashlight, test lamp, multimeter, two way radios (2), and stopwatch
- Personal Oxygen Monitor (POM), as required

### 3.9 Posting:

3.7.1 Prior to performing tests, where necessary, post entrance gates with signs that the area is under test.

3.10 Software Running:

3.10.1 At the beginning of each test, record the version of software running in A and B Divisions of the PLC.

4. Precautions

4.1 All personnel shall ensure their own safety by following the standards, safety rules, and the training they receive. In general, all energy sources must be locked out and tagged. Working on-or-near energized sources is not permitted unless a valid Energized Electrical Work (EEW) permit has been issued. Personnel shall utilize tools, instruments, equipment (e.g., proper connectors and proper ac line cords), etc., that are safe and proper for the job. If any part of a job appears unsafe to any individual, it is their duty to discontinue work and inform the supervisor, manager, ESH Coordinator, or the C-A ESSHQ Division Head, of the unsafe condition.

4.2 Testing involves working in close proximity to or contact with 115 VAC circuits, which must be kept energized. Comply with the requirements of the Energized Electrical Work Permit, including appropriate PPE specified in the permit.

4.3 All voltage rated insulated tools shall be visually inspected for physical damage prior to use

4.4 When in Mode 24, all non-ACG test personnel must be swept from the area under test.

4.5 ACG test personnel in the tunnel, during Mode 24 testing, must wear a POM.

4.5.1 In the event of a POM alarm, or upon hearing a noise that may be due to escaping cryogen, occupants should immediately trip a crash operator to cancel Mode 24 and enable fan protection.

5. Procedure

**Warning 1:**

Partial or complete loss of protection from the interlock system may result if temporary jumper wires are NOT removed. Some tests require the use of jumper wires to reduce testing to manageable steps. Document the installation and removal of all jumper wires. VERIFY that all temporary jumper wires used for testing are promptly removed when testing is completed.

**Warning 2:**

In order to avoid the potential for creating a radiation hazard, ensure that all upstream sources are locked out and tagged out by an RS LOTO BEFORE any ACS output relays are manipulated.

**Note:**

Items on the test checklist may remain untested if approval is on the checklist by the RSC Chairperson and the C-A Chief Electrical Engineer

5.1 Conduct Acceptance Tests

- 5.1.1 Acceptance Tests are defined in the Attachments.
- 5.1.2 Use only a pen with permanent, non-erasable ink to fill in the test procedure verification responses.
- 5.1.3 Each verification check-off box in the test procedure must be checked “√” if the test is passed, and “X” if the test has failed.
- 5.1.4 The TTL shall sign off on the lines in the procedures marked “completion of initial testing...” at the initial completion of the test procedure, regardless of anomalies encountered during testing.
- 5.1.5 Compile all failed test results on an ACS Trouble Log Tracking Sheet.
- 5.1.6 Document all repairs in the ACS Maintenance Log Book.
- 5.1.7 The TTL shall sign off on the lines in the procedures marked “final acceptance...” subsequent to correction of anomalies and successful retest.
- 5.1.8 Following successful completion of testing, the C-A ACG Leader and the RSC Chair, and/or their designees, shall review the test results.
- 5.1.9. The C-A ACG Leader, and the RSC Chair, and/or their designees, shall sign the Test Procedure Cover Sheet on their acceptance of the Test Procedure results.

6. Documentation

- 6.1 Completed test procedures to be filed with the C-A ACG Leader following completion of testing.
- 6.2 ACS Trouble Log Tracking Sheet (as required), to be filed with the C-A ACG Leader following completion of testing.
- 6.3 ACS Maintenance Log Book.
- 6.4 RS LOTO Log Sheet (as required) to be filed with Main Control Room (MCR) RS LOTO records. A copy shall be filed with C-A ACG Leader before the start of testing.

**7. References**

- 7.1 [C-A-OPM 1.5, “Electrical Safety Implementation Plan”](#).
- 7.2 [C-A OPM 1.5.3 “Procedure to Open or Close Breakers and Switches”](#).
- 7.3 [C-A-OPM 2.36 “Lockout/Tagout for Control of Hazardous Energy”](#).
- 7.4 [BNL SBMS Electrical Safety](#).
- 7.5 [BNL SBMS Lockout/Tagout Implementation Plan](#)

**8. Attachments**

- 8.1 ACS Trouble Log Tracking Sheet.
- 8.2 ACS Subsystem Tests Numbering Tree.



**Access Controls Group  
Subsystem Acceptance Test Numbering Assignment**

**Attachment 8.2**

RHIC	4.120.1 through 4.120.19
AGS	4.120.20 through 4.120.39
Beam Line Experimental	4.120.40 through 4.120.59
Booster	4.120.60 through 4.120.69
Linac	4.120.70 through 4.120.79
Tandem	4.120.80 through 4.120.99
NSRL	4.120.100 through 4.120.119
Accelerator Test Facility (ATF)*	4.120.120 through 4.120.139
e-Cooler Facility (eCF)	4.120.140 through 4.120.159
Cyclotron Isotope Research Center (CIRC)	4.120.160 through 4.120.179
Beam Line Transport	4.120.180 through 4.120.199
REF	4.120.200 through 4.120.219

\*These procedures to be approved by Physics Department Chair

**Attachment Assignment**

a	Critical Device
b	Gate
c	Crash
d	Sweep
e	Mode 24
f	Chipmunk
g	Power Up
h	ODH
i	Gas Detection
j	Laser System