EMERGENCY SERVICES DIVISION BROOKHAVEN NATIONAL LABORATORY	Procedure No: FR-GEN-7.0.0 Revision No: 1 Page 1 of 5

Title: Maintenance Shop Operations at Building 599

1.0 **PURPOSE:**

1.1 To define the safe operations of the maintenance activities associated with hydro- static testing and maintenance of fire extinguishers (FE), Self Contained Breathing Apparatus (SCBA) and Oxygen (0_2) cylinders at building 599 shop.

2.0 **RESPONSIBILITIES:**

2.1 Fire Chief: Overall responsibility of facility operation and safety.

2.2 Facility Manager & Co-manager: To ensure operations are conducted within the current BNL Standards Based Management System (SBMS), Department of Transportation (DOT) regulations, National Fire Protection Association (NFPA) guidelines and Compressed Gas Association (CGA) regulations directly supervising work.

2.3 Shift Captain: Assigns work and ensures that the shop is properly staffed.

2.4 Shift Lieutenant/Work Coordinator responsibilities: Ensures adequate tools and parts for inspection, test and maintenance.

2.5 Firefighter: Performs work within this Standard Operating Procedure. When in doubt, stop and ask the Facility Manager or Co-Manager

3.0 **DEFINITIONS:**

3.1 Facility Manager and Co-Manager are named on the DOT license.

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4.0 PREREQUISITES:

4.1 Workers are trained as per EM-FR02 series every two years. Facility Manager or co-manager must be present when work is performed.

4.2 Two person minimum in shop, includes Facility Manager or Co-Manager.

4.3 All current calibrations and equipment are in good working order.

5.0 PRECAUTIONS:

5.1 No open SCBA cylinders are permitted in the room while servicing powdered fire extinguisher agents. Powder may contaminate the inside of cylinders.

5.2 Personal protective equipment shall consist of hardhats for overhead operations, eye protection for general shop operations, ear plugs for cylinder discharge & recharge, SCBA/CO_2, gloves for co-operations and abrasion hazards, face shield, cryo gloves, halon nitrogen and separator and steel safety shoes for general operations.

6.0 PROCEDURE:

6.1 Acceptance of cylinders for work:

6.1.1 No radiologically activated or contaminated materials on or in cylinder.
6.1.2 No chemical contamination on or in cylinder.
6.1.3 No damage to cylinders (requires work planning review**).**
6.1.4 No non-BNL cylinders without Facility Manager's permission.
6.1.5 No composite cylinders 15 years or older (for disposal only).

6.2 Preparation of cylinders:

Type	Agent	Agent Disposition
Pressurized water	Water	Sanitary system
Carbon Dioxide	CO_2	Atmosphere
Halon	1211, 1301	Recovery
ABC, BC, PK, Metal-X	Various	Recovery, do not mix
Oxygen	Oxygen	Atmosphere, remote from fuel and ignition sources
SCBA	Air	Atmosphere
Inergen	N_2, CO_2, Argon	Atmosphere
FM 200	FM 200	Recovery

6.3 External Inspection:

Use DOT and NFPA-10 criteria. Failure of cylinder results in disposal of cylinder.

6.4 Remove valve from cylinder. For composite cylinder use bar vice to avoid damage to fiberglass wrap.

6.5 Perform internal inspection to DOT and NFPA–10 criteria. Facility Manager determines if excessive scale is present to prevent rework. Dispose of failed cylinder.

6.6 Hydrotest:

A) DOT vessels – high pressure testing stamped. Follow machine instructions & CGA/NFPA/DOT, criteria. *Steel cylinders must be hammer tested.*
Failure: Complete DOT log, x-out DOT numbers and drill cylinder.
Passed: Complete DOT log, mark new hydro date on cylinder. Scan bar code for hydrotest.

B) Low pressure testing, non-DOT vessels. Follow operator aid & CGA/NFPA
Failure: Complete DOT Log, drill cylinder. Passed: Complete DOT Log, and place cylinder back in service.

C) Dry chemical six-year maintenance, perform agent and cylinder inspection according to NFPA criteria for dry chemical, dry powder.

D) Empty hydrostatic test water into drain and hydrostatic test area, then dry cylinder.

6.7 Documentation: Complete the Hydro-test inspection form. Scan bar code for hydrotested.

6.8 Refill Procedure: Inspect to insure it is dry.

Refill water and powder type.	**Refill gas and SCBA cylinders.**	**Oxygen Cylinders** .	**Refill SCBA**
• Rebuild internal parts on head. • Replace dry chemical with Proper Agent • Confirm weight on scale. • Replace head per manufacturer instructions. • Set gauge on supply regulator to desired pressure. • Pressurize cylinder. • (monitor pressure on cylinder gauge)	• Rebuild head and replace parts as required. • Replace head as per manufacturer instructions. • Secure cylinders to weighing rack for 50 lbs. or above. • Monitor cylinder contents by weight and pressure gauge. • Refill cylinder using refill equipment procedures. • Disconnect refill	• Send out to be refilled and or heads to be rebuilt.	• Rebuild heads and replace parts as required. • Replace head as per manufacturer's instruction. • Refill cylinder in cascade air system following manufacturer's instruction. • Check for leaks.

• Check for leaks by submersing in hydro tank water. Observe absences of bubbles.	lines, bleed out lines, and leak check cylinders, CO_2 & SCBA use hydro tank; Halon use sniffer). • Finish assembly of CO_2 hoses replace protective caps for fixed system cylinders.		

Scan cylinders for completed inspection. Hold 24 hours in shop for leak check prior to release.
Place in pool and secure as necessary.
Use DOT criteria, NFPA-10, failure-disposal.
For six-year inspection scan bar code at this point.

7.0 **IMPLEMENTATION AND TRAINING**

7.1 Before any operation can be performed in the facility, all users must be trained in all phases of this procedure and qualified by the Duty Captain.

8.0 REFERENCES:

DOT 49 CFR 173.34
NFPA10 "Fire Extinguisher Standard"
CGP Pamphlet C-1.
National American Fire Equipment Distributor's service and recharge manuals.

9.0 ATTACHMENTS

None