National Institute for Occupational Safety and Health NIOSH® National Institute for Occupational Safety and Health National Personal Protective Technology Laboratory		
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DETERMINATION OF REMAINING SERVICE-LIFE INDICATOR - OPEN-CIRCUIT, DEMAND AND PRESSURE-DEMAND, SELF-CONTAINED BREATHING APPARATUS STANDARD TESTING PROCEDURE (STP)

1. PURPOSE

This test establishes the procedures for ensuring that the level of protection provided by the remaining service-life indicator requirements on Open-Circuit, Demand and Pressure-Demand, Self-Contained Breathing Apparatus (SCBA) submitted for Approval, Extension of Approval, or examined during Certified Product Audits, meet the minimum certification standards set forth in 42 CFR, Part 84 Subpart H, Section 84.83(e)(f).

2. GENERAL

This STP describes the Determination of Remaining Service-Life Indicator - Open-Circuit, Demand and Pressure-Demand, Self-Contained Breathing Apparatus test in sufficient detail that a person knowledgeable in the appropriate technical field can select equipment with the necessary resolution, conduct the test, and determine whether or not the product passes the test.

3. EQUIPMENT/MATERIALS

3.1. The list of necessary test equipment and materials follows:

3.1.1. ISI Anthropometric Test heads with tube for measuring breathing resistance and air flows—Model SR-085 or equivalent.

3.1.2. High Pressure Test Stand. A test stand incorporating calibrated pressure gauges (at least one 0-10,000 psig and one 0-3,000 psig) or equivalent.

3.1.3. Source of high-pressure air. Breathing air compressor (6,000 psig), equipped with a vertical purifier system, capable of delivering 0-6,000 psig, a minimum of 1,125 psig or equivalent.

4. TESTING REQUIREMENTS AND CONDITIONS

4.1. Prior to beginning any testing, all measuring equipment employed has been calibrated in accordance with the testing laboratory's calibration procedure and schedule. All measuring equipment utilized for this testing must have been calibrated using a method traceable to recognized international standards when available.

5. PROCEDURE

5.1. Close off tube on anthropometric test head.

5.2. Assemble self-contained breathing apparatus as per manufacturer's instructions.

5.3. Mount facepiece on anthropometric test head.

5.4. Remove air supply bottle and attach test stand in the bottle's place.

5.5. Charge the system with the compressor.

5.6. Bleed the unit down through the regulator by-pass valve or the pressure tap connection hose at a rate of 10 psig per second.

5.7. When each warning device activates (e.g., heads-up display [HUD], Vibralert), the pressure on the test stand gauge should be recorded on the data sheet.

5.8. Repeat steps 5.1.5, 5.1.6, and 5.1.7 six times and record data.

Note: This test should be performed on a minimum of two respirators for each pressure configuration, or more if additional testing is required.

6. PASS/FAIL CRITERIA

6.1. The criterion for passing this test is set forth in 42 CFR, Part 84, Subpart H, Section 84.83(e)(f).

84.83 Timers; elapsed time indicators; remaining service life indicators; minimum requirements.

(e) Remaining service-life indicators or warning devices shall be provided in addition to a pressure gage on compressed gas self-contained breathing apparatus, except apparatus used for escape only, and shall operate automatically without preadjustment by the wearer.

(f) Each remaining service-life indicator or warning device must give an alarm when the remaining service life is reduced to a minimum of 25 percent of its rated service time or any higher minimum percent value or values as specified in the approval. Open-circuit demand and pressure-demand respirators must alarm continuously until depletion of the breathing air supply. The percent value set for indicator activation must be identified by labels and/or markings on each respirator unit.

7. RECORDS/TEST SHEETS

7.1. Record the test data in a format that shall be stored and retrievable. Data shall be reported as shown in attached example data sheet.

ALARM PRESSURE #1, OPEN-CIRCUIT, SELF-CONTAINED BREATHING APPARATUS

Project No.: ____ Date: __________

Manufacturer: ____

Respirator Type: ____

Reference: 42 CFR Part 84, Subpart H, 84.83(e)(f).

Requirement: Each remaining service-life indicator or warning device must give an alarm when the remaining service life is reduced to a minimum of 25 percent of its rated service time or any higher minimum percent value or values as specified in the approval. Open-circuit demand and pressure-demand respirators must alarm continuously until depletion of the breathing air supply. The percent value set for indicator activation must be identified by labels and/or markings on each respirator unit.

Procedure: Pressure is recorded from test stand.

Results:

	Event	Full Cylinder Pressure (psig)	Alarm Pressure (psig)	Result (P/F)
Unit ID#__				
Unit ID#__				
Unit ID#__				
Unit ID#__				
Unit ID#__				

	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
Unit ID#__	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
Unit ID#__	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____
	____	_____	_____	____

Comments:

_____

_____

_____

_____

Test Engineer: _____ Pass _____ Fail _____

8. ATTACHMENTS

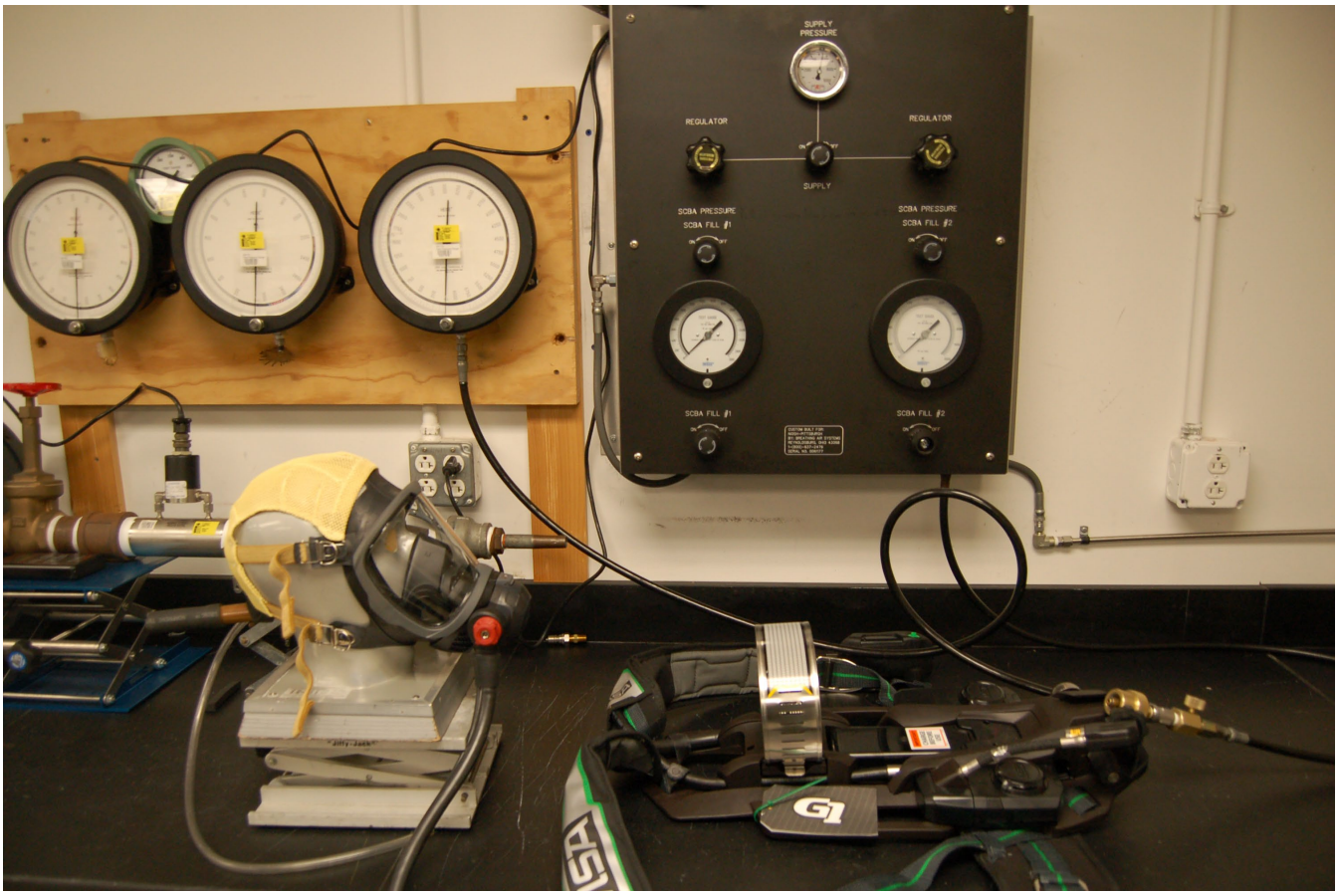

Figure 1: Test setup for determination of remaining service-life indicator.

Revision History

Revision	Date	Reason for Revision
1.0	5 July 2000	Historic document
1.1	21 September 2005	Update header and format to reflect lab move from Morgantown, WV No changes to method
1.2	18 May 2022	Changes reflect current testing practices and regulatory requirements, with updates to equipment, testing procedure, and photos.