National Institute for Occupational Safety and Health National Personal Protective Technology Laboratory P.O. Box 18070 Pittsburgh, PA 15236		
Procedure No. RCT-ASR-STP-0124A	Revision: 1.1	Date: 21 September 2005

DETERMINATION OF ALARM PRESSURE - CLOSED-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 alarm pressure requirements on Closed-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 G, Section 84.63(a)(c)(d), Subpart H, Section 84.83(e)(f) and 84.96(a)(b); Volume 60, Number 110, June 8, 1995.

2. GENERAL

This STP describes the Determination of Alarm Pressure Test - Closed-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. Electric Timer, calibrated to hundredths of a minute (Precision Scientific Company) or equivalent.

Approvals:	1st Level	2nd Level	3rd Level

3.1.2. O_2 compressor (Haskel Engineering and Supply Co.) or equivalent.

4. TESTING REQUIREMENTS AND CONDITIONS

4.1. Prior to beginning any testing, all measuring equipment to be used must have been calibrated in accordance with the manufacturer's calibration procedure and schedule. At a minimum, all measuring equipment utilized for this testing must have been calibrated within the preceding 12 months using a method traceable to the National Institute of Standards and Technology (NIST).

4.2. The compressed gas cylinder must meet all applicable Department of Transportation requirements for cylinder approval as well as for retesting/ requalification.

4.3. Normal laboratory safety practices must be observed. This includes all safety precautions described in the current ALOSH Facility Laboratory Safety Manual.

4.3.1. Safety glasses, lab coats, and hard-toe shoes must be worn at all times.

4.3.2. Work benches must be maintained free of clutter and non-essential test equipment.

4.3.3. When handling any glass laboratory equipment, lab technicians and personnel must wear special gloves which protect against lacerations or punctures.

5. PROCEDURE

Note: Reference Section 3 for equipment, model numbers and manufacturers. For calibration purposes use those described in the manufacturer's operation and maintenance manuals.

5.1. Conduct Man Test numbers 1, 2, 3, and 4 in duplicate.

5.2. Record the time and pressure of the alarm activation occurring during each test.

5.3. The alarm should activate between 20 and 25% of the service time or between 20 and 25% of the maximum service pressure of the respirator.

5.4. In the event neither subject uses enough of the available oxygen to cause the alarm to sound, the following procedure will be followed:

5.5. Open the unit by-pass enough to cause a slow constant bleed down of pressure.

5.6. Shut off the by-pass as soon as the alarm sounds.

5.7. Remove oxygen bottle and connect to oxygen compressor.

5.8. Open oxygen cylinder and note pressure on calibrated compressor gauge.

5.9. Repeat steps 5.5 through 5.8 six times and record data.

Note: This test should be done on a minimum of two respirators, or more if additional testing is required (42 CFR, Part 84, Sections 84.12, 84.30, and 84.60).

6. PASS\FAIL CRITERIA

6.1. The criterion for passing this test is set forth in 42 CFR, Part 84, Subpart G, Section 84.63(a)(c)(d), Subpart H, Section 84.83(e)(f) and 84.96(a)(b); Volume 60, Number 110, June 8, 1995.

6.2. This test establishes the standard procedure for ensuring that:

84.63 Test requirements; general.

(a) Each respirator and respirator component shall when tested by the applicant and by the Institute, meet the applicable requirements set forth in subparts H through L of this part.

(c) In addition to the minimum requirements set forth in subparts H through L of this part, the Institute reserves the right to require, as a further condition of approval, any additional requirements deemed necessary to establish the quality, effectiveness, and safety of any respirator used as protection against hazardous atmospheres.

(d) Where it is determined after receipt of an application that additional requirements will be required for approval, the Institute will notify the applicant in writing of these additional requirements, and necessary examinations, inspections, or tests, stating generally the reasons for such requirements, examinations, inspections, or tests.

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 pre-adjustment by the wearer.

(f) Each remaining service-life indicator or warning device shall give an alarm when the remaining service life of the apparatus is reduced within a range of 20 to 25 percent of its rated service time, or pressure.

Note: For apparatus which do not have a method of manually turning off the remote gauge in the event of a gauge or gauge line failure the remaining service life indicator is required to be set at 25% ± 2% of the rated service time or pressure.

84.96 Service time test; closed-circuit apparatus.

(a) The closed-circuit apparatus will be classified according to the length of time it supplies adequate breathing gas to the wearer during man test No. 4 described in Table 4 of this subpart.

(b) The service time obtained on man test No. 4 will be used to classify the closed-circuit apparatus in accordance with 84.53.

7. RECORDS\TEST SHEETS

7.1. All test data will be recorded on the ALARM PRESSURE/TIME, CLOSED-CIRCUIT, SELF-CONTAINED BREATHING APPARATUS test data sheet.

7.2. All videotapes and photographs of the actual test being performed, or of the test equipment shall be maintained in the task file as part of the permanent record.

7.3. All equipment failing any portion of this test will be handled as follows;

7.3.1. If the failure occurs on a new certification application, or extension of approval application, send a test report to the RCT Leader and prepare the hardware for return to the manufacturer.

7.3.2. If the failure occurs on hardware examined under an Off-the-Shelf Audit the hardware will be examined by a technician and the RCT Leader for cause. All equipment failing any portion of this test may be sent to the manufacturer for examination and then returned to NIOSH. However, the hardware tested shall be held at the testing laboratory until authorized for release by the RCT Leader, or his designee, following the standard operating procedures outlined in Procedure for Scheduling, and Processing Post-Certification Product Audits, RB-SOP-0005-00.

ALARM PRESSURE/TIME, CLOSED-CIRCUIT,
SELF-CONTAINED BREATHING APPARATUS

Project No. : _____ Date: _____

Company : _____

Respirator Type: _____

Reference: 42 CFR, Part 84, Subpart H, 84.83(e)(f) and 84.96(a)(b).

Requirement: Each remaining service life indicator or warning device shall give an alarm when the remaining service life of the apparatus is reduced within a range of 20 to 25% of its rated service time/pressure or 23 to 27% if unit does not have a remote gauge shutoff.

Event No.	Alarm Pressure/-psig	Alarm Time	Remarks
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

Comments:

_____

_____

_____

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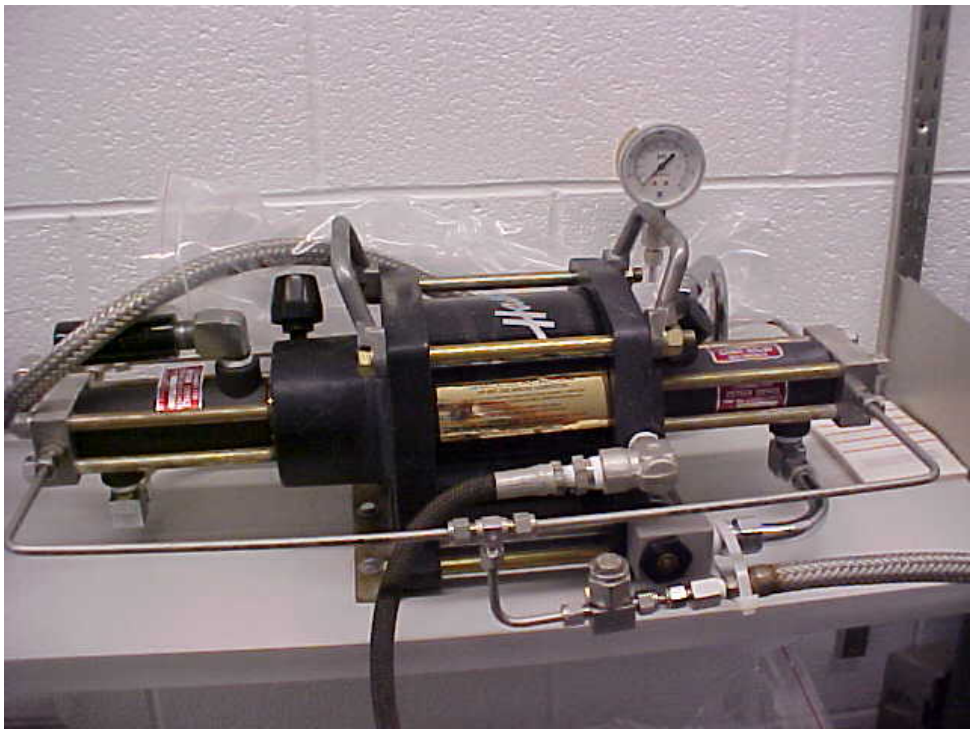
_____

Test Engineer: _____ Pass _____ Fail_____

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Revision History

Revision	Date	Reason for Revision
1.0	6 July 2000	Historic document
1.1	21 September 2005	Update header and format to reflect lab move from Morgantown, WV No changes to method