National Institute for Occupational Safety and Health
National Personal Protective Technology Laboratory
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Procedure No. CET-APRS-STP-CBRN-0311	Revision: 1.2	Date: 8 December 2005

DURABILITY CONDITIONING PROCESS FOR ENVIRONMENTAL, TRANSPORTATION AND ROUGH HANDLING USE CONDITIONS ON CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN) RESPIRATORY PROTECTIVE DEVICES (RPD) STANDARD CONDITIONING PROCEDURE (SCP)

1. PURPOSE

1.1. This procedure establishes the actions required for the Durability Conditioning Process for Environmental, Transportation and Rough Handling Conditions on the Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air-Purifying Respirators (APR).

1.2. The purpose of this test is to subject the CBRN APR and the canisters to a series of environmental and transportation conditions and then the canisters alone to rough handling conditions (Drop Test) in order to test the items for durability. The environmental and transportation challenge tests represent conditions that a CBRN APR and the canisters may experience from the point of issue that is induced by the user. Also, the users may subject canisters to rough handling conditions that are represented by the Drop Test. The conditioning procedures described herein are not intended to assess manufacturers' packaging, handling and shipping practices but to test the CBRN APR and canisters for initial life cycle failure when subjected to potentially harsh conditions by a user. The CBRN APR and canisters shall be conditioned in the Minimum Packaging Configuration as defined in the manufacturer's User Instructions. This procedure may be used for other types of Respiratory Protective Devices (RPD): Refer to the primary Statement of Standard of that RPD for the Durability Conditioning requirements.

2. GENERAL

This STP describes the Durability Conditioning Process for Environmental, Transportation and Rough Handling Conditions (Drop Test) of the Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece APR and canisters in sufficient detail that a person knowledgeable in the appropriate technical field and MIL-STD-810 (E or F) can select equipment with the necessary resolution and conduct the conditioning in accordance with the requirements of this procedure and MIL-STD-810 (E or F).

Approvals:	1st Level	2nd Level	3rd Level

3. TEST EQUIPMENT/MATERIAL

3.1. Test Equipment

3.1.1. Environmental and Transportation Conditions

3.1.1.1. High Temperature: The test facility shall comply with the requirements stated in MIL-STD-810F, Method 501.4, Section 4.1. or equivalent.

3.1.1.2. Low Temperature: The test facility shall comply with the requirements stated in MIL-STD-810F, Method 502.4, Section 4.1. or equivalent.

3.1.1.3. Humidity: The test facility shall comply with the requirements stated in MIL-STD-810E, Method 507.3, Section II-1.1. or equivalent.

3.1.1.4. Vibration: The test facility shall comply with the requirements stated in MIL-STD-810F, Method 514.5, Section 4.1. or equivalent. The vibration test surface shall have a wood Containment Fixture with adjustable wooden slats or separator fencing to keep the items individually contained and from falling off the test surface. A mechanical drawing is provided in Appendix A illustrating one such possible design of the Containment Fixture. There shall be a minimum of 1.27 cm (0.5 in) space between the test items and the separator fencing.

3.1.2. Rough Handling Drop Test

3.1.2.1. Tape Measure graduated in specific increments

3.1.2.2. Bare Concrete Floor (No tile or carpeting)

3.1.3. Figures 1, 2 and 3 illustrates a temperature/ humidity chamber that can be used for the high temperature, low temperature and humidity environmental challenge test, and Figure 4 illustrates a vibration control system. Both of these systems meet the requirements of MIL-STD-810(E or F). Contained in Appendix B, Environmental and Vibration Challenge Test Equipment List, is a list indicating test equipment, model numbers, and manufacturers; however, other test equipment and sources may be used provided that the equipment meets the requirements of MIL-STD-810.

Figure 1

Temperature Humidity Chamber (Storage Area)

Figure 2

Temperature Humidity Chamber and Control Panel

Figure 3

Control Panel for Temperature Humidity Chamber

Figure 4

Vibration Control System with 4 x 4 Foot Vibration Table

3.2. Required Test Items.

There shall be eight (8) CBRN Full Facepiece APRs (complete systems including accessories)) and 125 canisters used to perform this test. These APRs and canisters shall be tested in the Minimum Packaging Configuration as specified by the manufacturer in the APR's User Instructions. The Facepieces of the APRs shall anatomically fit the medium head size of the SMARTMAN manikin (manufactured by ILC Dover, Frederica, DE)

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. Prior to beginning any testing, all test facilities; equipment and conditions must comply with the requirements of MIL-STD-810 (E or F) or equivalent.

4.3. Normal laboratory safety practices must be observed. This includes safety precautions described in the current Bruceton Facility Laboratory Safety Manual or site-specific procedures that are applicable to the health and safety requirements.

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

4.3.2. All test equipment shall be in a safe operating condition, and the test administrators shall comply with all equipment safety operating procedures.

5. PROCEDURES

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. This procedure describes the conditioning sequence that the CBRN APR and canisters must undergo before conducting the performance tests required by 42 CFR Part 84 and the Statement of Standard for Chemical, Biological, Radiological and Nuclear (CBRN) Full Facepiece Air-Purifying Respirator (APR), March 7, 2003 with Revision 2, April 4, 2004. This procedure outlines the sample size, MIL-STD-810(F or E) Test Method, duration, sequence and package configuration for testing the CBRN APR and canisters. The CBRN APR

and canisters will be subjected to the High Temperature, Low Temperature, Humidity and Vibration tests in the "Minimum Packaging Configuration (e.g., in carrier, protective storage container or loose)" as defined by the respirator manufacturer in the User Instructions. After these tests, only the canisters will be subjected to the Rough Handling Drop Test in their individual packaging containers.

5.2. Minimum Packaging Configuration

There shall be eight (8) CBRN Full Facepiece APRs that anatomically fit the medium head size of the SMARTMAN manikin (manufactured by ILC Dover, Frederica) and 125 canisters exposed sequentially to High Temperature, Low Temperature, Humidity and Vibration tests. The 8 CBRN APRs and 125 canisters shall be tested in the "Minimum Packaging Configuration", and the tests represent environmental, transportation and rough handling conditions that the items may be subjected while in the possession of the user. The manufacture will specify the packaging configuration for the "Minimum Packaging Configuration" for the CBRN APR, accessories and canisters.

5.3. Test Items

Indicate on the General Information Sheet contained in Appendix C, Durability Test Data Sheets, the following information about the applicant and their CBRN APR System:

- NIOSH Application Number
- Name of Manufacturer
- Model Number of RDP
- Model Number of Canister
- Date Arrived
- Date of Test
- General Condition of Packaging
- Appearance of RPD and Canisters
- Any Specific Physical Anomalies
- Type of Test being Conducted

The Appendix C entitled, Durability Test Data Sheets, consists of the following three sections: General Information Sheet, Test Incident Report, and Environmental and Transportation Conditioning and Rough Handling Data Sheet. The General Information Sheet is to document basic information about the applicant and their CBRN APR system and to indicate test initiation and termination dates and times. The purpose of the Test Incident Report is to document any equipment failure or alteration to the procedure resulting from an unforeseen, external event such as an electrical power outage, storm, etc and to

document the corrective action taken. The purpose of the Environmental and Transportation Conditioning and Rough Handling Data Sheet is to document the condition of the test item after subjecting the item to each Durability Test challenge.

5.4. Number Test Items

All test items shall be individually assigned an administrative number. The administrative number shall be marked on each test item with an indelible pen in 2 places or a single tag in a sequence so that the number can be traced to the NIOSH application number, manufacturer, model number and that the test items can be tracked throughout the series of tests. For example, the canister number sequence can be C1, C2, C3, and the APR can be APRM1, APRM2, APRM3 meaning Air Purifying Respirator Medium #1, Air Purifying Respirator Medium # 2, etc.

5.5. Environmental and Vibration Conditioning

Test initiation and termination dates and times shall be recorded on the General Information Sheet for all test conditions and test items; High Temperature, Low Temperature, Humidity and Vibration tests. After each of the Environmental tests and the Vibration tests, the condition of the test items shall be indicated on the Environmental and Transportation Conditioning and Rough Handling Data Sheet.

5.5.1. Environmental Conditioning

For the Environmental Conditioning, the test facility controls and testing procedures shall be in compliance with MIL-STD-810 (E or F). The temperature/humidity tests conducted in the Environmental Conditioning shall be conducted in accordance with the procedures classified under storage.

5.5.1.1. High Temperature, MIL-STD-810F, Method 501.4.

5.5.1.1.1. Place 8 CBRN APRs including accessories and 125 canisters in the high temperature chamber per application.

5.5.1.1.2. Adjust the chamber settings to perform the test conditions indicated in MIL-STD-810F, Method 501.4, Diurnal Cycle Condition, Table 501.4-II, for the Hot-Induced Conditions 35 ^{0}C (95 ^{0}F) to 71^{0}C (160^{0}F). The rate of temperature change shall not be greater than 3^{0}C (6^{0}F) per minute to prevent thermal shock to the test

items. Humidity control is not necessary for this particular High Temperature test.

5.5.1.1.3. Expose the test items for 21 cycles at the hot diurnal cycle to represent 3 weeks of storage.

5.5.1.1.4. At the completion of the last cycle, adjust the chamber air temperature to controlled ambient conditions and maintain until temperature stabilization of the test item has been achieved.

5.5.1.1.5. Conduct a complete visual checkout of the test items and record results and any specific physical anomalies on the Environmental and Transportation Conditioning and Rough Handling Data Sheets.

5.5.1.1.6. Next the items will be subjected to Low Temperature storage.

5.5.1.2. Low Temperature, MIL-STD-810F, Method 502.4.

5.5.1.2.1. Place the test times in the low temperature test chamber per application.

5.5.1.2.2. Adjust the chamber temperature setting to -31 ^{0}C (- 24 ^{0}F), constant temperature exposure per MIL-STD-810F, Method 502.4, Basic Cold (C1). The rate of temperature change shall not be greater than 3^{0}C (6^{0}F) per minute to prevent thermal shock to the test items.

5.5.1.2.3. Once temperature has stabilized, test items shall remain exposed to -31 ^{0}C (- 24 ^{0}F) for 72 hours.

5.5.1.2.4. At the completion of 72 hours, adjust the chamber air temperature to controlled ambient conditions and maintain until temperature stabilization of the test item has been achieved.

5.5.1.2.5. Conduct a complete visual checkout of the test items and record results and any specific physical anomalies on the Environmental and Transportation Conditioning and Rough Handling Data Sheets.

5.5.1.2.6. Next the items will be subjected to Humidity storage.

5.5.1.3. Humidity, MIL-STD-810E, Method 507.3.

5.5.1.3.1. Place the test items in the humidity test chamber per application.

5.5.1.3.2. Adjust the chamber temperature setting to replicate the temperature and humidity conditions of MIL-STD-810E, Method 507.3, Procedure I, Natural, Hot Humid (Cycle 1) as indicated in Table 507.3-I, "High humidity diurnal categories". The rate of temperature change shall not be greater than 3^0C (6^0F) per minute to prevent thermal shock to the test items.

5.5.1.3.3. Once temperature and humidity has stabilized, test items shall remain exposed for 5 days as described in MIl-STD-810E, Method 507.3, Table 507.3-II, "Test Cycles", Natural, Cycle 1, Quick Look for Non-Hazardous Items.

5.5.1.3.4. At the completion of the last cycle, adjust the chamber air temperature and relative humidity controlled ambient conditions and maintain until temperature and humidity stabilization of the test item has been achieved.

5.5.1.3.5. Conduct a complete visual checkout of the test items and record results and any specific physical anomalies on the Environmental and Transportation Conditioning and Rough Handling Data Sheets.

5.5.1.3.6. Next the items will be subjected to Vibration Conditioning.

5.5.2. Vibration Conditioning

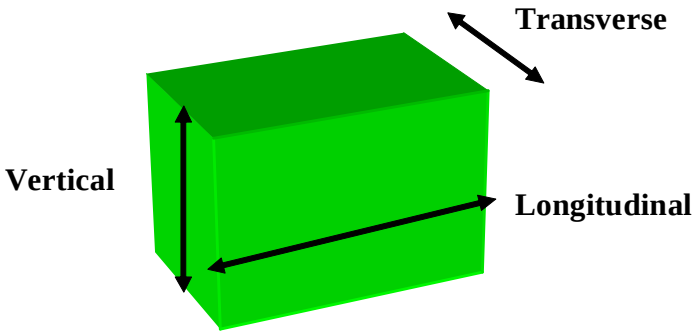
For the Vibration Conditioning, the Vibration Control System shall use a Containment Fixture illustrated in Appendix A to segregate the test from one another, and the testing procedures shall be in compliance with MIL-STD-810F, Method 514.5.

5.5.2.1. Fasten the Containment Fixture on the vibration table of the Vibration Control System.

5.5.2.2. The items shall be vibrated along the Transverse, Longitudinal and Vertical axes. It may be necessary to orientate the test items in order to test all three of the axes. Figure 5 is and illustration of the Axes of Vibration.

Figure 5

Axes of Vibration



5.5.2.3. Place the test items in the transverse position in the individual compartments of the Containment Fixture. Adjust the sideboards and dowel-rods of the Containment Fixture if necessary so there is a minimum of 1.27 cm (0.5 in) space around the perimeter of the test item.

5.5.2.4. Adjust the setting of the vibration machine to replicate the vibration to be in accordance with MIL-STD-810F, Method 514.5, Annex A, Category 4, Section 2.2.1.c.1, Truck transportation over U.S. highways.

5.5.2.5. The test items shall be vibrated for 12 hours in the transverse position.

5.5.2.6. When the test items have been vibrated for 12 hours in the transverse position, rotate the items to the longitudinal position. Adjust the sideboards and dowel-rods of the Containment Fixture if necessary so there is a minimum of 1.27 cm (0.5 in) space around the perimeter of the test item.

5.5.2.7. Adjust the setting of the vibration machine to replicate the vibration to be in accordance with MIL-STD-810F, Method 514.5, Annex A, Category 4, Section 2.2.1.c.1, Truck transportation over U.S. highways.

5.5.2.8. The test items shall be vibrated for 12 hours in the longitudinal position.

5.5.2.9. When the items have been vibrated for 12 hours in the longitudinal position, rotate the items to the vertical position. Adjust the sideboards and dowel-rods of the Containment Fixture if necessary so there is a minimum of 1.27 cm (0.5 in) space around the perimeter of the test item.

5.5.2.10. Adjust the setting of the vibration machine to replicate the vibration to be in accordance with MIL-STD-810F, Method 514.5, Annex A, Category 4, Section 2.2.1.c.1, Truck transportation over U.S. highways.

5.5.2.11. The test items shall be vibrated for 12 hours in the longitudinal position.

5.5.2.12. Conduct a complete visual checkout of the test items and record results any specific physical anomalies on the Environmental and Transportation Conditioning Data Sheets.

5.5.2.13. Next perform the Rough Handling Drop Test on only the 125 Canisters.

5.5.2.14. If the Rough Handling Drop Test is going to be performed at a different location, adequately package the CBRN APRs so shipping does not induce any damage and deliver them to the specified address for additional testing.

5.6. Rough Handling Drop Test

The Rough Handling Drop Test shall be performed on only the 125 canisters that were previously subjected to the Environmental and Vibration conditions. The 125 canisters shall be tested in their individual packaging container or Minimum Packaging Configuration as specified by the respirator manufacturer. The Rough Handling Drop Test consists of dropping the 125 canisters one time. The Rough Handling Drop Test initiation and termination dates and times for all test items shall be recorded on the General Information Sheet. After each canister is dropped in its individual packaging container, the orientation of drop and resulting condition shall be documented on the Environmental and Transportation Conditioning and Rough Handling Data Sheet.

5.6.1. Out of the 125 canisters, there shall be 41 canisters dropped once on each of the following axis as indicated in Figure 6, Axis of Impact:

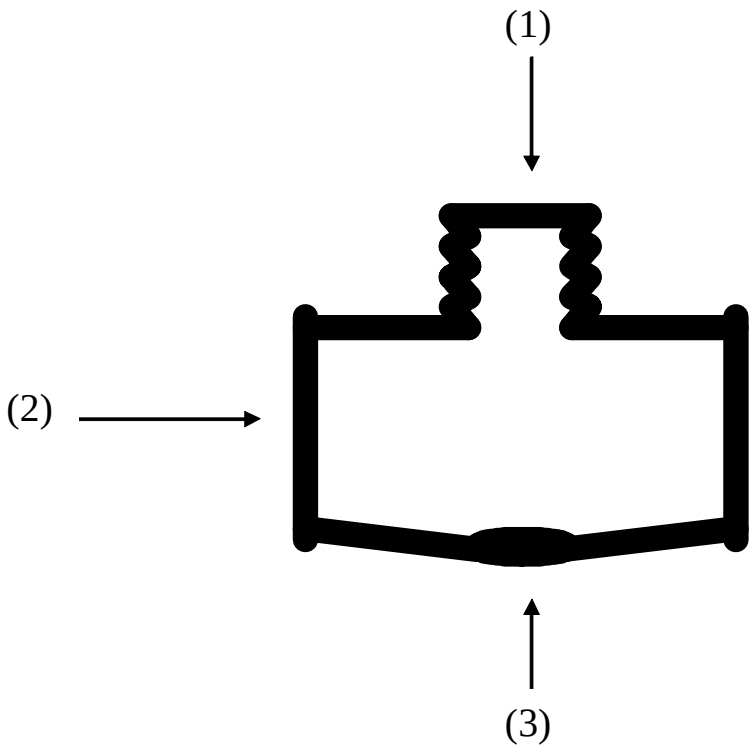
(1) Major axis vertical, air outlet port
(2) Major axis horizontal
(3) Major axis vertical, air inlet port

Of the two (2) remaining canisters from the original 125 canister, one shall be dropped on the (1) Major axis vertical, air outlet pot and the other shall be dropped on the (2) Major axis vertical, air inlet port. If a modified application occurs that has less than 125 canister, the quantity shall be divided by three (3) and drop tested as usual with the extra any canisters being dropped on Axis (1) and (2).

NOTE: If the canisters are in a nontransparent packaging container and the axis can't be identified, the top of the can will serve as (1) major axis vertical, air outlet port, the side of the can will serve as (2) major axis horizontal, and the bottom of the can will sever as (3) major axis vertical, air inlet port. Indicate on the canister's individual packaging container and on the Environmental and Transportation Conditioning Data Sheets what side of the canister container is (1), (2) and (3).

Figure 6

Axis of Impact



5.6.2. There shall be 42 canisters dropped on the major axis vertical, air outlet port. These canisters shall be the ones that were previously administratively numbered from 1 to 42.

5.6.3. From a height of 0.9144 meters (3 feet), position a canister so the major axis vertical, air outlet port (1) will impact the concrete surface.

5.6.4. Position the canister so the lowest point of the canister is at the 0.9144 meters (3 feet) elevation mark; in other words, maximize the height of the canister.

5.6.5. Release the canister and after impact, conduct a complete visual checkout of the test item and record on Environmental and Transportation Conditioning Data Sheets the canister number, axis of impact any specific physical anomalies.

5.6.6. Repeat Steps 5.6.3. to 5.6.5. for the other 41 canisters that are designated to be dropped on the major axis vertical, air outlet port (1).

5.6.7. There shall be another 41 canisters dropped on the major axis horizontal (2). These canisters shall be the ones that were previously administratively numbered from 43 to 83.

5.6.8. From a height of 0.9144 meters (3 feet), position a canister so the major axis horizontal (2) will impact the concrete surface.

5.6.9. Position the canister so the lowest point of the canister is at the 0.9144 meters (3 feet) elevation mark; in other words, maximize the height of the canister.

5.6.10. Release the canister and after impact, conduct a complete visual checkout of the test item and record on the Environmental and Transportation Conditioning Data Sheets the canister number, axis of impact any specific physical anomalies.

5.6.11. Repeat Steps 5.6.8. to 5.6.10. for the other 40 canisters that are designated to be dropped on the major axis horizontal (2).

5.6.12. There shall be another 42 canisters dropped on the major axis vertical, air inlet port (3). These canisters shall be the ones that were previously administratively numbered from 84 to 125.

5.6.13. From a height of 0.9144 meters (3 feet), position another canister so the major axis vertical, air inlet port (3) will impact the concrete surface.

5.6.14. Position the canister so the lowest point of the canister is at the 0.9144 meters 0.9144 meters (3 feet) elevation mark; in other words, maximize the height of the canister.

5.6.15. Release the canister and after impact, conduct a complete visual checkout of the test item and record on the Environmental and Transportation Conditioning Data Sheets the canister number, axis of impact any specific physical anomalies.

5.6.16. Repeat Steps 5.6.13. to 5.6.15. for the other 41 canisters that are designated to be dropped on the major axis vertical, air inlet port (3).

5.6.17. Adequately package the 125 drop-tested canisters into five (5) multiple over-pack boxes and appropriately label boxes according to the subsets below. Adequate packaging shall ensure that the canisters are not damaged during the shipping process. The five (5) boxes shall be destined either to **P**: NPPTL, NIOSH Respirator Branch, Certification, Evaluation, and Testing Section or **E**: U.S. Army Edgewood Chemical Biological Center, Edgewood, MD. The 125 canisters shall be separated into the following five (5) subsets:

P: Subset 1, Gas Life Testing at 64 Liter per Minute

20 canisters dropped on the major axis vertical, air outlet port
20 canisters dropped on the major axis horizontal
20 canisters dropped on the major axis vertical, air inlet port

P: Subset 2, Gas Life Testing at 100 Liter per Minute

10 canisters dropped on the major axis vertical, air outlet port
10 canisters dropped on the major axis horizontal
10 canisters dropped on the major axis vertical, air inlet port

P: Subset 3, Filtration Testing, DOP, P100

7 canisters dropped on the major axis vertical, air outlet port
6 canisters dropped on the major axis horizontal
7 canisters dropped on the major axis vertical, air inlet port

E: Subset 4, HD and GB Agent Permeation Testing

1 canisters dropped on the major axis vertical, air outlet port

2 canisters dropped on the major axis horizontal
1 canisters dropped on the major axis vertical, air inlet port.

P: Subset 5, Spare Queue if Needed for either **P** or **E** location

4 canisters dropped on the major axis vertical, air outlet port
3 canisters dropped on the major axis horizontal
4 canisters dropped on the major axis vertical, air inlet port

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).

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.

The test items shall be subjected to additional NIOSH performance tests described in Title 42 Code of Federal Regulations (CFR) Part 84 and the Statement of Standard for Chemical, Biological, Radiological and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR), March 7, 2003 with Revision 2, April 4, 2004. The Pass/Fail criteria for these test items have been established in the applicable Title 42 CFR 84 and the Statement of Standard for Chemical, Biological, Radiological and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR), March 7, 2003 with Revision 2, April 4, 2004.

7. RECORDS/TEST SHEETS

7.1. All test data shall be recorded on the Environmental and Transportation Conditioning Data Sheets.

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

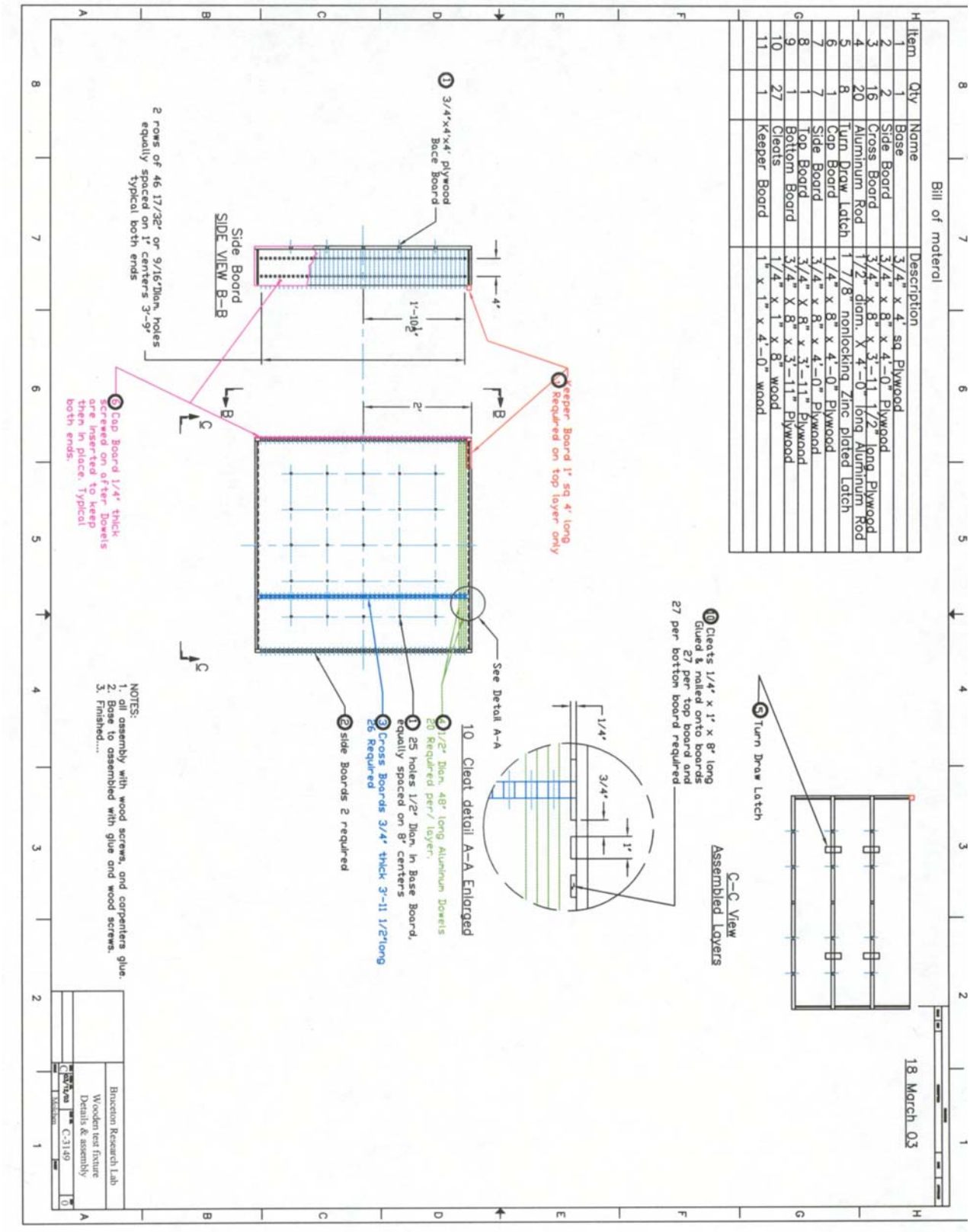
7.3. All equipment failing any portion of this test will be handled as follows:

7.3.1. If the failure occurs on a new certification application, or extension of approval application, send a test report to the Certification, Evaluation and Testing Section Chief and prepare the hardware for return to the manufacture.

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 Certification, Evaluation and Testing Section Chief 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 Certification, Evaluation and Testing Section Chief, or designee, following the standard operating procedures outlined in the Procedure for Scheduling, and Processing Post-Certification Product Audits, RB-SOP-0005-00.

APPENDIX A

DRAWING OF CONTAINMENT FIXTURE


Bill of material
Item Qty Name Description
1 1 Base 3/4" x 4' sq Plywood
2 2 Side Board 3/4" x 8" x 4'-0" Plywood
3 16 Cross Board 3/4" x 8" x 3'-11 1/2" long Plywood
4 20 Aluminum Rod 1/2" diam. X 4'-0" long Aluminum Rod
5 8 Turn Draw Latch 1 7/8" nonlocking Zinc plated Latch
6 1 Cap Board 1/4" x 8" x 4'-0" Plywood
7 1 Side Board 3/4" x 8" x 4'-0" Plywood
8 1 Top Board 3/4" x 8" x 3'-11" Plywood
9 1 Bottom Board 3/4" x 8" x 3'-11" Plywood
10 27 Cleats 1/4" x 1" x 8" wood
11 1 Keeper Board 1" x 1" x 4'-0" wood
1 3/4"x4'x4' plywood Base Board
Side Board SIDE VIEW B-B
2 rows of 46 17/32" or 9/16"Diam. holes equally spaced on 1" centers 3'-9" typical both ends
4'
1'-10 1/2"
2"
Keeper Board 1" sq 4' long Required on top layer only
Cap Board 1/4" thick screwed on after Dowels are inserted to keep then in place. Typical both ends.
See Detail A-A
10 Cleat detail A-A Enlarged
1/4"
3/4"
1"
Cleats 1/4" x 1" x 8" long Glued & nailed onto boards 27 per top board and 27 per bottom board required
C-C View Assembled Layers
Turn Draw Latch
18 March 03
3 1/2" Diam. 48" long Aluminum Dowels 20 Required per/ layer.
25 holes 1/2" Diam. in Base Board, equally spaced on 8" centers
Cross Boards 3/4" thick 3'-11 1/2"long 26 Required
Side Boards 2 required
NOTES:
1. all assembly with wood screws, and carpenters glue.
2. Base to assembled with glue and wood screws.
3. Finished....
Bruceton Research Lab
Wooden test fixture Details & assembly
C-3149

Appendix B

Environmental And Vibration Challenge Test Equipment List

ITEM	MDL #	S/N	DATE CALIBRATED
Unholtz-Dickie Corp. Vibration Test System, Electrodynamic, with Accessories	289		
Russells Technical Products Temp/Humidity Chamber with Research, Inc. Micristar Controller	RDV100-705 828E		
Spectral Dynamics Vibration Control System on Sun Sparc Station 4	2550		
Ling Dynamic Systems Vibration System W/ components	V-964LS		
Envirotronics Temp/ Humidity Chamber w/Research, Inc. Micristar Controller/ Honeywell Truline Chart Recorder	EVH-100-2-705 828-E11 910-80714		
Spectral Dynamics Vibration Control System on Sun Sparc Station 4	2550		
Elliott Williams Chamber W/Systems Plus Controller And Honeywell Truline Chart Recorder (Walkin6)	386 91428414-		
PCB Accelerometer	308B		
PCB Accelerometer	308B		

APPENDIX C

Durability Test Data Sheets

General Information Sheet

NIOSH Application Number _____

Name of Manufacturer _____

Model Number of RPD_____

Model Number of Canister _____

Date Arrived _____

Test Date _____

General Condition of Packaging _____

Appearance of RPD and Canisters _____

Any Specific Physical Anomalies _____

Type of Test being Conducted _____

Environmental/Transportation/Rough Handling: Test Dates and Times:
High Temp: Start Date and Time_____; End Date and Time_____
Items Tested:_____

High Temp: Start Date and Time_____; End Date and Time_____
Items Tested:_____
(If Applicable: Incase 2 sets of Test Items are Tested at Different Times)

Low Temp: Start Date and Time_____; End Date and Time_____
Items Tested:_____

Low Temp: Start Date and Time_____; End Date and Time_____
Items Tested:_____
(If Applicable; Incase 2 sets of Test Items are Tested at Different Times)

Humidity: Start Date and Time_____; End Date and Time_____
Items Tested:_____

Humidity: Start Date and Time_____; End Date and Time_____
Items Tested:_____

(If Applicable; Incase 2 sets of Test Items are Tested at Different Times)
Vibration: Start Date and Time_____; End Date and Time_____
Items Tested:_____

Vibration: Start Date and Time_____; End Date and Time_____
Items Tested:_____
(If Applicable; Incase 2 sets of Test Items are Tested at Different Times)Vibration: Start Date and Time_____; End Date and Time_____
Items Tested:_____
(If Applicable; Incase 2 sets of Test Items are Tested at Different Times)
Drop: Start Date and Time_____; End Date and Time_____
Items Tested:_____

Drop: Start Date and Time_____; End Date and Time_____
Items Tested:_____
(If Applicable; Incase 2 sets of Test Items are Tested at Different Times)

Drop: Start Date and Time_____; End Date and Time_____
Items Tested:_____
(If Applicable; Incase 2 sets of Test Items are Tested at Different Times)

Test Incident Report

DATE:	TIME:	TIR #:	UNIT #:

TEST NAME:	
TEST LOCATION:	
TEST ENGINEER ON SITE:	
DESCRIBE TEST INCIDENT:	

STATE CORRECTIVE ACTION:	
DAMAGE TO EQUIPMENT (IF ANY)	

NAME:	COMPANY:
TELEPHONE#/FAX OR EMAIL:	**DATE/TIME NOTICE SENT:**
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Environmental and Transportation Conditioning and Rough Handling Data Sheet

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Test Item #	Pre-Test Condition	Post High Temperature Condition	Post Low Temperature Condition	Post Humidity Condition	Post Vibration Condition	Axis of Drop, (1, 2 or 3)	Post Drop Test Condition

Revision History

Revision	Date	Reason for Revision
1.0	22 July 2003	Historic document
1.1	28 June 2005	Update header and format to be consistent with remainder of STP's. No changes to method
1.2	8 December 2005	- Style editing - Includes references to MIL-STD-810 E or F - Terminology change from "Ready-to-Use Configuration" to "Minimum Packaging Configuration". - Alter dimension of free space around items during conditioning from 1 inch (2.54 cm) to 0.5 inch (1.27cm).