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1.0 PURPOSE & SCOPE

Purpose: This procedure defines the role of the IH group in developing and coordinating an effective respiratory protection **Quantitative Fit Test (QNFT)** program. As a minimum, the program will comply with OSHA 29CFR1910.134 Respiratory Protection and ANSI Z88.2. American National Standard for Respiratory Protection. Elements of ANSI Z88.10 (Respirator Fit Testing Methods) are followed as a Best Management Practice. This SOP describe the principles and policies of QNFT and is designed to be used in conjunction with IH72350 (*Operation of the Portacount™ Plus*) or IH72360 (*Operation of the Portacount™*) that describe the operation of a particular fit test apparatus.

2.0 RESPONSIBILITIES

- 2.1 This program is implemented through the SHSD Industrial Hygiene Group Leader and the *Respiratory Protection Program Administrator (RPPA)*. Members of the SHSD Industrial Hygiene Group and other BNL organizations, with qualifications accordance with Section 7 of this procedure, can perform fit testing.
- 2.2 It is the responsibility of persons conducting testing to comply with all provisions in the Respiratory Protection Program Procedure IH72100 and Instrument Operation Procedure

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IH72350 or IH72360, and IH72450. It is the responsibility of persons conducting testing to document results of the testing in compliance with these SOPs.

2.3 The IH Group maintains the equipment used in this procedure.

3.0 DEFINITIONS

QNFT- Quantitative Fit Test: A test in which a challenge agent is administered outside the face piece and the presence of the agent is detected and enumerated by analytical instrumentation. Agents used include corn oil, saccharin, and ambient room dust.

Portacount Plus™ and Portacount™: A QNFT apparatus manufactured by TSI® Inc. utilizing the particulates found in ambient air as the challenge medium. Quantification is by optical density measurement using condensation nucleus counting technology. The instrument specifications include detection of particles as small as 0.02 µm in a range of 0.1 to 5 x 10⁵ particles/cm³.

Tight fitting facepiece: Any respirator facepiece that relies on a “mask to face” seal to provide protection. This class includes quarter, half, and full facepiece masks used in both negative and positive pressure modes in air purifying and supplied air respirators. Excluded from this classification are hoods and helmet style respirators.

4.0 PREREQUISITES

- 4.1 **Calibration of equipment:** Test equipment used in this program will be calibrated on an annual basis by the manufacturer of equipment, or by an equivalent, independent calibration service provider. The IH Group will maintain records for a minimum of three years.
- 4.2 **Fit Testers Qualifications:** Only persons with current qualification can perform the role of *Fit Tester* in this program. Approval process is documented in is per Section 7.
- 4.3 **Persons being fit tested:** Only persons who have documented records of compliance with the Respiratory Protection Program requirements for OMC Respirator Protocol and BNL Office of Training and Qualification (OTQ) training (or BNL Respiratory Protection Program Administrator approved equivalent) for the type of mask being fitted are allowed to be fit tested. It is the role of the fit tester to verify compliance with the Respiratory Protection Program requirements prior to commencing the fit test by:
 - Examining the BNL Respirator Authorization Card (training and medical approval) or
 - Accessing the employee’s records in the Brookhaven Training Management System (training and medical approval).

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- Examining the OMCX Medical Approval form (medical approval).

Acceptable OMC Medical Approval and Training status are:

| IND317 Fit Test to be Conducted on 12 month cycle | Training 12 month cycle | OMC Approval 18 month cycle |
|---|---|--|
| Half face- APR/PAPR HP-IND-317D North 7700-Half Mask HP-IND-317L North 5500 Half Mask | IND-301/301W | Half-Mask Air Purifying Respirator |
| Full Face- APR/PAPR HP-IND-317C North 7600 HP-IND-317J MSA Advantage 2000 | IND-301/301W | Full-Face Air Purifying Respirator |
| Full Face- Supplied Airline | <u>Airline Respirator</u> (TQ-AIRLINE-RESP) or RPPA approved record | Air-Line Respirator (mask/ hood and hoses) |
| SCBA HP-IND-317K Scott AV3000 | IND-309 or Emergency Services Training record equivalent. | Self-Contained Breathing Apparatus |
| Avon Military Mask HP-IND-317H | SSD training record | Full-Face Air Purifying Respirator |

5.0 PRECAUTIONS

- 5.1 **Equipment Contamination:** It is possible that some individuals may have an undiagnosed contagious disease that could be transmitted from person to person by close contact with face-pieces if the equipment is not properly sanitized between users. In all cases, personal protective equipment owned by the IH Group that is used for fit testing must be thoroughly sanitized between wearers following procedures set up in the SOP IH72450.
- 5.2 Fit testers are not authorized to conduct fit testing on persons with known contagious infectious diseases.
- 5.3 **Personal Protective Equipment (PPE) for fit tester:** The operation of the fit test equipment does not expose the fit tester to any hazard. Personal protective equipment is not required.

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- 5.4 **Hazard Determination:** The operation of fit test equipment does not cause exposure to any chemical, physical, or radiological hazards.
- 5.5 **Environmental Impact and Waste Disposal:** This technique does not have adverse impact on the environment. The fit test apparatus uses minute quantities of Isopropanol that is consumed in the fit test. There is no need for disposal. Any unused solvent that are to be discarded must be disposed of in accordance with Waste Management Division directions and procedures.
- 5.6 **Job Risk Assessment:** Consult the *Job Risk Assessment* [SHSD-JRA-12](#) for the risk analysis of this operation based on the hazards and controls of this SOP.

6.0 PROCEDURE

- 6.1 **Equipment:**
- 6.1.1 TSI® Portacount™ Respirator Fit Tester, or equivalent..
 - 6.1.2 Appropriate respirators- probed for fit testing.
 - 6.1.3 HEPA filter cartridges for above respirators.
 - 6.1.4 Authorization Cards, laminating pouches (GBC 3202105 from Corporate Express)
 - 6.1.5 Intentionally damaged/defective facepieces for examination by wearers.
- 6.2 **Pre-Test Qualification:** Verify that the person to be tested is in compliance with the Respiratory Protection Program Medical Approval and Training requirements in [Section 4.3](#) prior to commencing the fit test.
- 6.3 **Screening:** Observe that the worker does not have any disqualifying conditions. As per OSHA 29CFR1910.134 Appendix A:
- 6.3.1 Do not perform a fit test on anyone with any hair growth between the skin and facepiece seal surface. This includes stubble beard growth, beards, moustaches, or sideburns that cross the respirator seal surface. (see Attachment 9.1 for photos of acceptable and unacceptable facial hair).
- When a worker comes for fit testing with facial hair (more than a trimmed moustache, a digital

Example of photo to be taken
(Note: this pattern of facial hair
would not be tested.)



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photo such as the photo to the right can be taken to document the facial hair present during the fit test. The photo should be saved with the fit test record.

- 6.3.2 Do not perform a fit test on anyone exhibiting difficulty in breathing during the tests or who otherwise demonstrates signs of medical impairment caused by the test.
- 6.4 **Defective Mask Inspection:** Have the worker examine the intentionally damaged/defective mask demonstration units and point out the defects in the equipment. Answer and questions on the equipment design and use. Record the test results on Attachment 9.6.
- 6.5 **User Instruction:** Instruct the user on proper techniques for donning and fitting the respirator, including:
- 6.5.1 Initial inspection,
 - 6.5.2 Cartridge/canister installation (if applicable),
 - 6.5.3 Donning, positioning, and adjusting the mask,
 - 6.5.4 Leak check procedures,
 - 6.5.5 QNFT test protocol and tests with a demonstration of each exercise.
- 6.6 **Selection of mask:** Select the respirator to be fit tested based on the type indicated on the *Employee Respirator Medical Approval Form* (i.e. half face, full face, SCBA, Avon, etc), see Attachment 9.4. Allow the user to try on respirators from available sizes and choose the respirator that is most comfortable and passes the leak check tests. If the preferred manufacturer model fails to provide a passing fit test, attempt a fit test from at least one other size, model or vendor in appropriate style. Ensure that the respirator selected is acceptable and comfortable to the worker.
- 6.7 **Leak Checks:** Have the user perform a positive and where possible a negative pressure leak check on the mask.
- 6.7.1 Negative pressure leak check: Have the user seal the inlet valve(s) to the respirator by covering the exposed face of the cartridges or removing the cartridges and covering the openings with the palm of the hand. Have the user inhale and verify that the mask contracts slightly inward before leakage occurs.
 - 6.7.2 Positive Pressure leak check: Have the user seal the exhalation valve(s) of the respirator with the palm of the hand and blow gently into mask. Verify that the mask expands slightly outward before leakage occurs.
 - 6.7.3 Record the results of the checks on Attachment 9.6
- 6.8 **Familiarization Period:** Allow the user to wear the mask for a familiarization period of at least five minutes prior to the fit test. If the mask becomes uncomfortable during that

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period, allow the user to select another mask and repeat the leak checks and familiarization period.

- 6.9 **Facepiece set-up:** Use either a surrogate facepiece having the same manufacturer model and size and material of construction that are the same as the wearer's facepiece in the workplace, or use the wearer's individually assigned facepiece. Tight fitting positive pressure respirator face-pieces are to be fit tested only in the negative-pressure mode regardless of the mode of operation in use.
- 6.10 **Fit test and Exercise regimen:** Following the appropriate Portacount Plus™ Fit Test Apparatus procedure for start up, validation, and operation. Have the worker complete a regimen of exercises that at the minimum include sixty seconds of the following exercises:
- Normal breathing
 - Deep breathing
 - Side to side head movement
 - Up and down head movement
 - Talking- counting backwards from 100, reciting the alphabet, Rainbow Passage, etc.
 - Grimace- smiling or frowning (15 seconds only)
 - Bending over
 - Normal breathing
- 6.11 **Calculation of Fit Test Factor:** Via the automated calculation of the Portacount Plus or by the following formulae, determine the fit factor:

$$\text{Fit Factor (FF)} = \frac{\text{Concentration outside the mask}}{\text{Concentration inside the mask.}}$$

$$\text{Overall Fit Factor} = N / (1/FF_1 + 1/FF_2 + \dots + 1/FF_N)$$

Where:

N = number of exercises
FF₁ = fit factor on the first exercise
FF₂ = fit factor on the second exercise
FF_N = fit factor on the Nth exercise

- 6.12 **Determine Passing Test based on BNL Fit Factor Criteria:**
- ANSI Z88.2 sets the fit factor to be at least 10 times greater than the Assigned Protection Factor and at a minimum of at least 100.
 - OSHA 29CFR1910.134 requires the fit factor to be at least 100 for tight fitting HALF face, and equal to or greater than 500 for tight fitting FULL face.
 - BNL policy shall require the fit test to meet the following fit test factor in order to pass based on the following table:

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| Mask Type | Required Fit Test Factor |
|-------------------------------------|--------------------------|
| APR- Half Face | 500 |
| APR- Full Face | 1000 |
| PAPR- Half Face | 500 |
| PAPR- Full Face | 1000 |
| SCBA Pressure Demand- Full Face | 1000 |
| Airline, Demand, Full Face | 1000 |
| Airline, Continuous flow, Full Face | 1000 |
| Airline, hood or helmet | N/A |
| Airline, loose fitting facepiece | N/A |
| Military Mask | 1000 |

(a) NIOSH Respirator Decision Logic Publication 97-108. & NIOSH Pocket Guide to Chemical Hazards (2002 Web)
 (b) ANSI Z88.2- 1992. (c) OSHA 29CFR1910.134

- 6.13 After the test exercises, question the test subject regarding the comfort of the respirator. If it has become unacceptable, another model of respirator needs to be tried. Record the results on Attachment 9.6.
- 6.14 Printout the fit test record from the automated system. Explain the results to the employee and obtain the fit testers and workers signature. Save the test results to computer memory. File the record under the employee's name. The IH Group will maintain the hardcopy records of the fit test for a minimum of three years.
- 6.15 Complete a *Respirator Authorization Card* (see Attachment 9.3), laminate, and give it to the worker.
- 6.16 Complete the record of the testing (*Fit Test Completion Record*) form (see Attachment 9.4), copy, and send the original to the BNL Training and Qualification Program Office.
- 6.17 SHSD fit test records should contain at a minimum the following information: Type of fit test and the fit test apparatus used, name of person conducting the fit test, specific make, model and size of respiratory protective devise, name of person tested, date of test, results of fit test, success or failure, any special considerations or difficulties in wearing (contact lenses, glasses, etc).

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7.0 Implementation and Training

- 7.1 The IH Group Leader or Respiratory Protection Program Administrator shall qualify persons to perform testing under this program. The qualification criteria for a *Fit Tester* are:
- 7.1.1 An overall knowledge of respiratory protection principles and successful completions of the BNL courses (or equivalent) in APR/PAPR and SCBA,
 - 7.1.2 Specific knowledge of this procedure, OSHA 29CFR1910.134, ANSI Z88.2, and Z88.10. This can be gained from work experience or specialized training courses.
 - 7.1.3 Demonstrated competency in performing this test to the satisfaction of the IH Group Leader or Respiratory Protection Program Administrator via:
 - Visual observation of the fit test technique using the fit test apparatus and the ability to assemble the respiratory protective equipment.
 - Demonstrated knowledge in the types of respiratory protective equipment used at BNL.
 - Demonstrated knowledge in respirator cleaning technique.
 - 7.1.4 The SHSD IH Group Leader documents training in the BNL BTMS database. See form in Attachment 9.8 *Qualification Documentation for QNFT Fit Tester*. *Fit Tester* personnel shall be re-qualified at a frequency not to exceed three years.
- 7.2 For non-SHSD personnel conducting fit testing, the *Fit Tester's* line management shall establish qualification criteria that are compliant with ANSI and OSHA drivers and shall qualify persons to perform fit testing under this program.

8.0 REFERENCES

- 8.1 OSHA 29CFR1910.134 (*Respiratory Protection*)
- 8.2 ANSI Z88.2. (*American National Standard for Respiratory Protection*).
- 8.3 ANSI Z88.10 (*Respirator Fit Testing Methods*)
- 8.4 BNL SHSD Procedures: *IH72200, IH73350, IH72360, IH72450.*

9.0 ATTACHMENTS

- 9.1 *Exhibit on Facial Hair*
- 9.2 Sample of Printed Documentation of Fit Test Record

The only official copy is on-line at the SHSD IH Group website.
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- 9.3 BNL F2287A, *BNL Respirator Authorization Card*
- 9.4 Sample of *OMC Medical Approval form*
- 9.5 Training & Qualifications Program Office - *Fit Test Completion Record*
- 9.6 *Fit Test & Respirator Inspection for Defect record*
- 9.7 *Visual And Physical Respirator Inspection Checklist*
- 9.8 Qualification Documentation for QNFT Fit Tester

10.0 Documentation

| Document Development and Revision Control Tracking | | |
|--|---|--|
| Prepared By: <i>(signature/date on file)</i> R. Selvey 04/02/02 Certified Industrial Hygienist | Reviewed By / Date: <i>(signature/date on file)</i> D. Wadman 04/03/02 SHSD respirator Fit Tester Lead | Approved By / Date: <i>(signature/date on file)</i> R. Selvey 04/03/02 Industrial Hygienist Group Leader |
| ESH Coordinator/ Date: <i>none</i> | Work Coordinator/ Date: <i>none</i> | SHSD Manager / Date <i>none</i> |
| QA Representative / Date: <i>none</i> | Training Coordinator / Date: <i>none</i> | Filing Code: IH52 |
| Facility Support Rep. / Date: <i>none</i> | Environ. Compliance Rep. / Date: <i>none</i> | Effective Date: 04/04/02 |
| ISM Review - Hazard Categorization <input type="checkbox"/> High <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Low/Skill of the craft | Validation: <input type="checkbox"/> Formal Walkthrough <input type="checkbox"/> Desk Top Review <input type="checkbox"/> SME Review Name / Date: | Implementation: Training Completed: Tracked in BTMS Procedure posted on Web: 01/08/08 Hard Copy files updated: 01/08/08 Document Control: 01/08/08 |

| Revision Log | | |
|---|----------------|----------------|
| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls | | |
| Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above | | |
| Section/page and Description of change: Revised format to add Section 7. Minor text improvements. | | |
| (signature/date on file) R. Selvey SME Reviewer/Date: 04/12/04 | Reviewer/Date: | Reviewer/Date: |
| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls | | |
| Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above | | |
| Section/page and Description of change: Added Attachment 9.6 and revised and added text in Section 6. | | |
| (signature/date on file) R. Selvey SME Reviewer/Date: 07/13/04 | Reviewer/Date: | Reviewer/Date: |

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| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Added Attachment 9.8 and modified text in Section 6.3. | | |
| (signature/date on file) R. Selvey SME Reviewer/Date: 09/14/04 | Reviewer/Date: | Reviewer/Date: |
| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input checked="" type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Rev4: Added column to Attachment 9.5 for mask size. Revised Attachment 9.6 to remove employee signature. This form is the instructor record of instruction. Employee signature is not required. Reviewed procedure and still effective and no other changes needed. | | |
| (signature/date on file) R. Selvey SME Reviewer/Date: 08/09/06 | Reviewer/Date: | Reviewer/Date: |
| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Changed Building number in Attachment 9.5. Removed reference to CPR in Section 7. (Now that fit testing is done in OMC< the need for CPR by the fit tester is eliminated.) | | |
| (signature on file) R. Selvey 02/26/07 Reviewer/Date: | Reviewer/Date: | Reviewer/Date: |
| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input checked="" type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input checked="" type="checkbox"/> none of the above Section/page and Description of change: Full review by SME. Numerous minor text revisions. Revised 2.1, 3.2, 4.2, 6.3, 6.6, 6.9, 6.10, 6.12, 6.15, and 7.14. Added 5.5 for JRA. Eliminated 6.16 which repeated text stated earlier. Table in 4.3, 9.3 and 9.7 revised for to change reference to Cairns SCBA. Moved Attachment 9.8 to 9.1 to ease document control. Renamed 9.1 to 9.8. Added "Sample" label to 9.4 and 9.5. Removed one photo in 9.1 "Acceptable" section. | | |
| (signature on file) R. Selvey 05/30/07 Reviewer/Date: | Reviewer/Date: | Reviewer/Date: |
| Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input checked="" type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input checked="" type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: ATS 3943.5.1 Closure: Added Section 6.13. Updated masks on Attachment 9.5. Added information on pre-requisites to Section 4.3. Referred to 4.3 in 6.2 and deleted redundant text. Changed link in 5.6 to JRA-12. Updated Attachment 9.6 with entry for post fit test comfort. | | |
| (signature on file) R. Selvey 01/07/08 Reviewer/Date: | Reviewer/Date: | Reviewer/Date: |

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Attachment 9.1

Examples Acceptable and Unacceptable Facial Hair

Acceptable

| | |
|---|---|
| Extremely closely shaven hair, ideal for fit testing and seal |  |
| Acceptable level of shaving, will typically provide good seal. |  |
| Half face: Acceptable Reason: Hair is not in the sealing region Full face: Acceptable Reason: same |  |
| Half face: Acceptable Reason: Hair is not in the sealing region Full face: Acceptable Reason: same |  |
| Half face: Acceptable Reason: Hair is not in the sealing region Full face: Acceptable Reason: same |  |

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Unacceptable

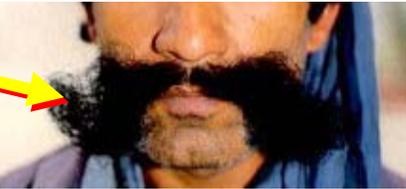
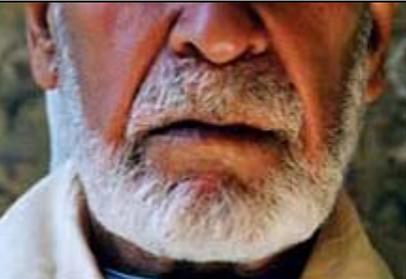
| | |
|--|---|
| Half face: Unacceptable Reason: The “five o’clock shadow” would fail this person. |  |
| Full face: Unacceptable Reason: same | |
| Half face: Unacceptable Reason: Hair from the moustache is not in the sealing region. However the “five o’clock shadow” would fail this person. |  |
| Full face: Unacceptable Reason: same | |
| Half face: Unacceptable Reason: Hair from the moustache is not in the sealing region. However the heavy “five o’clock shadow” would fail this person. |  |
| Full face: Unacceptable Reason: same | |
| Half face: Unacceptable Reason: Hair is in sealing region under the chin and on the side of the face |  |
| Full face: Unacceptable Reason: same | |

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| <p>Half face: Unacceptable Reason: Hair is in sealing region under the chin</p> <p>Full face: Unacceptable Reason: same</p> |  |
| <p>Half face: Unacceptable Reason: Hair is in sealing region under the chin and on the cheeks</p> <p>Full face: Unacceptable Reason: same</p> |  |
| <p>Half face: Unacceptable Reason: Hair is in sealing region under the chin</p> <p>Full face: Unacceptable Reason: same</p> |  |
| <p>Half face: Unacceptable Reason: Hair is in sealing region under the chin</p> <p>Full face: Unacceptable Reason: same</p> |  |
| <p>Half face: Unacceptable Reason: The heavy hair in sealing region under the chin would prevent a good seal.</p> <p>Full face: Unacceptable Reason: same</p> |  |
| <p>Half face: Unacceptable Reason: Hair would likely block the sealing region or entangle with the valves.</p> <p>Full face: Unacceptable</p> |  |

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| BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division | NUMBER IH72300 |
| | REVISION FINAL Rev7 |
| INDUSTRIAL HYGIENE GROUP Standard Operating Procedure | DATE 01/07/08 |
| | PAGE 14 of 23 |
| | |
| Subject: Respiratory Fit Testing- QNFT Program Policy & Principles | |

| | |
|--|---|
| Reason: same | |
| Half face: Unacceptable Reason: Hair would likely block the sealing region or entangle with the valves. |  |
| Full face: Unacceptable Reason: same | |
| Half face: Unacceptable Reason: A beard of this size would preclude any chances of a good seal. |  |
| Full face: Unacceptable Reason: same | |
| Half face: Unacceptable Reason: A beard of this size would preclude any chances of a good seal. |  |
| Full face: Unacceptable Reason: same | |

The only official copy is on-line at the SHSD IH Group website.
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

| | |
|---|-------------------------------|
| BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP Standard Operating Procedure | NUMBER IH72300 |
| | REVISION FINAL Rev7 |
| Subject: <h2 style="text-align: center;">Respiratory Fit Testing- QNFT Program Policy & Principles</h2> | DATE 01/07/08 |
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Attachment 9.2

Sample of Printed Documentation of Fit Test Record

03/12/2002

LAST NAME GA
FIRST NAME MI

FIT TEST REPORT
Fit test information

ID NUMBER 22
 LAST NAME G
 FIRST NAME M
 COMPANY SHSD
 LOCATION BLDG 902A/8236
 NOTE

CUSTOM1
CUSTOM2
CUSTOM3
CUSTOM4

TEST DATE 03/12/2002
 TEST TIME 13:53
 DUE DATE 03/12/2003

PORTACOUNT S/N 15463
N95 COMPANION N

RESPIRATOR
 MANUFACTURER CAIRNS
 MODEL SCBA
 MASK STYLE FULL FACE
 MASK SIZE MED/LARGE
 APPROVAL
 EFF. < 99% N

PROTOCOL DEFAULT 29CFR1910.134
PASS LEVEL 1000

| EXERCISE | DURATION (SEC) | FIT FACTOR | PASS |
|---------------------|----------------|------------|------|
| NORMAL BREATHING | 60 | 19100 | Y |
| DEEP BREATHING | 60 | 3540 | Y |
| HEAD SIDE TO SIDE | 60 | 18100 | Y |
| HEAD UP AND DOWN | 60 | 15700 | Y |
| TALKING | 60 | 1970 | Y |
| GRIMACE | 10 | Excl. | X |
| BEND AND TOUCH TOES | 60 | 2080 | Y |
| NORMAL BREATHING | 60 | 23400 | Y |

OVERALL FF 4720 Y

FIT TEST OPERATOR [Redacted] DATE 3/12/02
SELVEY

NAME [Redacted] DATE 3/12/02
MIKE GAFFNEY

The only official copy is on-line at the SHSD IH Group website.
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

| | |
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Attachment 9.3

Sample of BNL F2287A, *BNL Respirator Authorization Card*

- Sample only -
 Official Copy is located in
 SBMS Respiratory Protection

FRONT OF CARD

| | |
|---|-------------------------|
| BROOKHAVEN NATIONAL LABORATORY RESPIRATOR AUTHORIZATION CARD | |
| NAME <i>John Doe</i> | |
| LIFE# <i>12345</i> | DEPT/DIV: <i>HP</i> |
| MEDICAL APPROVAL | |
| BNL OMC | EXPIRES <i>02/02/05</i> |
| TRAINING | |
| APR/PAPR | EXPIRES |
| SCBA | EXPIRES <i>02/07/05</i> |
| AIR LINE | EXPIRES |

BNL F2287A

Obtain this information from the card being surrendered and replaced or from the BTMS database

BACK OF CARD

| | | |
|---------------------------|------|--|
| FIT TESTING | | |
| MFGR / STYLE | SIZE | EXPIRES |
| NORTH 7700 HALF | | <i>02/02/05</i> |
| NORTH 7600 FULL | | |
| MSA Advantage FULL | | |
| Scott NxG SCBA | | <i>02/07/05</i> |
| RESTRICTIONS | | |
| | | <input checked="" type="checkbox"/> EYE GLASSES |
| OTHER | | |

Write in the appropriate date, i.e. 12 months from the date of fit testing

Check this if the employee needs to wear prescription glasses within the facepiece to conduct work safely.

The only official copy is on-line at the SHSD IH Group website.
Before using a printed copy, verify that it is current by checking the document issue date on the website.

| | |
|---|-------------------------------|
| BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP Standard Operating Procedure | NUMBER IH72300 |
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Attachment 9.4

Sample of OMC Medical Approval form

(See next pages)

Attachment 9.5

TRAINING & QUALIFICATIONS PROGRAM OFFICE FIT TEST COMPLETION RECORD

(See next pages)

**Brookhaven National Laboratory Respiratory Protection Program Record
BNL Employee Respirator Medical Approval Form**

This form should be completed and available to the examining physician at the Occupational Medicine Clinic (OMC) at the time of your medical evaluation for respirator use.

Employee Last Name: _____ First Name: _____

Life No: _____ Dept./Div. _____ Building No: _____ Extension: _____

Types, approximate weights of respirator, and respiratory working conditions for this employee

- | | |
|--|--|
| <input type="checkbox"/> Self-Contained Breathing Apparatus (20 Lbs.) | <input type="checkbox"/> Full-Face Air Purifying Respirator (2 – 3 Lbs.) |
| <input type="checkbox"/> Air-Line Respirator (mask/ hood and hoses) (9 Lbs.) | <input type="checkbox"/> Half-Mask Air Purifying Respirator (0.75 Lb.) |
| <input type="checkbox"/> Powered Air Purifying Respirator (5 Lbs.) | <input type="checkbox"/> Escape Pack (3 Bottle Unit) (16 Lbs.) |

Duration and frequency of respirator use: Hours per Day Days per Week Weeks per Year

Expected physical work effort: Light Moderate Strenuous Very Strenuous

Potential for Heat Stress: Maximum Expected Temp F C Maximum Expected Humidity (%)

Use for rescue or escape: _____

Additional protective clothing /equi _____

Respirator Use Requires:

Spectacle Kit Needed _____

**- Sample only -
Official Copy is located in
SBMS Respiratory Protection**

BNL Supervisor _____ FS Rep. _____
Printed Name Mail Printed Name Mail

ES&H Coordinator _____
Printed Name Signature Date Mail

This portion to be completed by Occupational Medicine Clinic (OMC):

Respirator use ***approved without limitation.***

Respirator users who have been medically qualified remain so until the next scheduled examination or eighteen months, whichever occurs first. No additional evaluation is required for 18 months from this date with the following exceptions:

Respirator use approved with limitations (checks or complete any that apply).

Respirator approval only through (specify date): _____

Employee approved for specific respirator and/or conditions, as follows _____

This is the date of Medical Approval, add 18 months and enter on authorization Card at OMC expiration date

Not approved for respirator use: Until further notice Until (specify date)

Employee should return to OMC on _____ for re-evaluation of respirator approval status.

This page should contain NO personal medical information

OMC Physician _____
Signature Date

- | | |
|---|--|
| <input type="checkbox"/> Original on file in OMC medical record | <input type="checkbox"/> Copy mailed to Facility Support Rep. |
| <input type="checkbox"/> Copy given to employee | <input type="checkbox"/> Copy mailed to ES&H Coordinator |
| <input type="checkbox"/> Copy to Office of Training and Qualifications (Bldg.703) | <input type="checkbox"/> Copy to Fit Test Office (Bldg. 120/490) |



**TRAINING & QUALIFICATIONS PROGRAM OFFICE
FIT TEST COMPLETION RECORD**
Send to: Training, Bldg. 400, or Fax to 8283

| | |
|---|---|
| Course Number: HP-IND-317 (A thru Z) Date: _____ | Course Name: Respirator Fit Testing Operator(s): _____ |
|---|---|

| | First Name (print) | Last Name (print) | Life/Guest Contractor # | Dept/Div | Select Respirator from List Below (enter A thru K) | Size | Medical Date OM-MEDSURV-RESP |
|-----|--------------------|-------------------|-------------------------|----------|--|------|------------------------------|
| 1. | | | | | HP-IND-317__ | | |
| 2. | | | | | HP-IND-317__ | | |
| 3. | | | | | HP-IND-317__ | | |
| 4. | | | | | HP-IND-317__ | | |
| 5. | | | | | HP-IND-317__ | | |
| 6. | | | | | HP-IND-317__ | | |
| 7. | | | | | HP-IND-317__ | | |
| 8. | | | | | HP-IND-317__ | | |
| 9. | | | | | HP-IND-317__ | | |
| 10. | | | | | HP-IND-317__ | | |

| | |
|--|--|
| <u>Respirator Fit Testing Entry Codes</u> HP-IND-317C North 7600 Full Face APR/PAPR [1000] HP-IND-317D North 7700 Half Mask [500] HP-IND-317H Avon F-12 Gas Mask HP-IND-317J MSA Advantage 3000 Full Face APR [1000] | HP-IND-317K Scott AV3000 SCBA Full Face APR [1000] HP-IND-317L North 5500 Half Mask [500] |
|--|--|

Fit Test & Respirator Inspection for Defects Record
Job Performance Measure (JPM) Completion Certificate

| | |
|------------------|--------------|
| Candidate's Name | Life Number: |
|------------------|--------------|

Fitness for Fit Test

| Criteria | Qualifying Standard | Unsatisfactory | Recovered | Satisfactory |
|-------------------------|--|----------------|-----------|--------------|
| Medical Approval | OMC (BNL Employees) or Off-site Licensed health care provider (Non-BNL) medical approval is within the last 16 months. | | | |
| Training | Documented training in BNL course (BNL Employee) or Contractor (Non-BNL Employee) class on the type of equipment to be fit tested. | | | |
| Smoking | Has not smoked within the last 2 hours prior to test. | | | |
| Spectacle Kit | Advised on the need the have ownership of eyewear for mask, as appropriate | | | |

Respirator Inspection for Defects, Donning, and Use

| Criteria | Qualifying Performance Standard | Unsatisfactory | Recovered | Satisfactory |
|-------------------------------------|---|----------------|-----------|--------------|
| Inspection of Defective Mask | Identifies the defects in the sample mask | | | |
| Donning Equipment | Demonstrates the proper placement of the equipment on the face and tightening of straps, etc. | | | |
| Negative Pressure Fit Check | Demonstrates performing the proper test and results indicate no leakage. | | | |
| Positive Pressure Fit Check | Demonstrates performing the proper test and results indicate no leakage. | | | |
| Post Fit Test Comfort | Comfort level of mask worn during familiarization and fit test is acceptable to the employee. | | | |

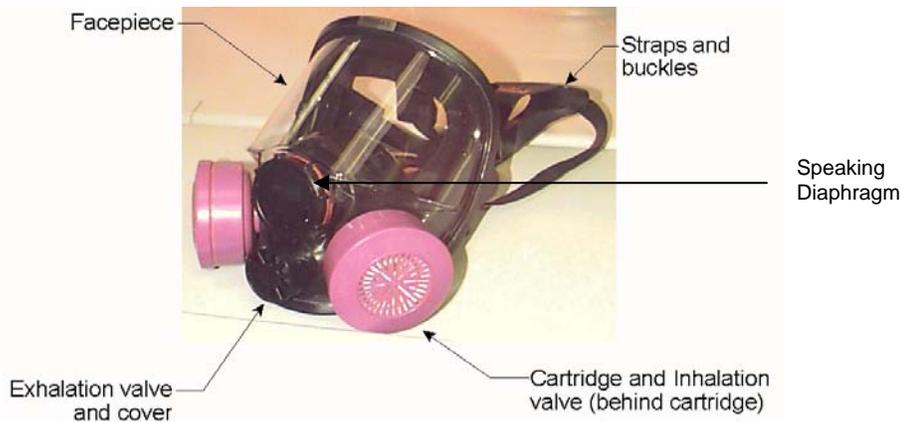
Evaluator: I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

| | |
|----------------------|-------|
| Evaluator Signature: | Date: |
|----------------------|-------|

- Issued **Yellow Approval Card**
- Issued **Voluntary Respirator Use** instruction sheet
- Issued **Inspection Checklist**

VISUAL AND PHYSICAL RESPIRATOR INSPECTION CHECKLIST

User's note: There can be no alteration, modifications or substitution of any components whatsoever to the respirator without the approval of the Manufacturer, otherwise the respirator is not approved by NIOSH.



FACEPIECE LENS

- Check for dirt, scratches or anything that impairs vision.
- Cracks are acceptable if the scratch does not penetrate the lens, i.e., ensure that you cannot feel the crack on the inner side of the lens
- No holes
- No distortion of the lens as if created by heat or temperature variances
- Lens clamp must be secure with bolt and nut

HEADSTRAPS:

- Straps should be complete with no distortions, breaks or tears
- No loss of elasticity
- No broken buckles or attachments
- Check the serrations on the straps to ensure they are not worn
- Note: For MSA equipment, rubber straps cannot be mixed with webbed or cloth straps for radiological decontamination purposes

INHALATION VALVES:

- Lift the valve and check for dust, dirt or any debris
- Look for detergent residue since the respirator's last washing
- Look for cracks or tears in the valve
- Lift the edge of the valve. When you release it, if the valve instantly gains its original shape, it is acceptable
- Check for dust, dirt or soap residue around valve port
 - If it is O.K., reinstall valve
- Check the nasal cup shape. Ensure it is not distorted or misshapen
- Ensure the interior of the nasal cup area is clean
- Look at the back side of the speaking diaphragm and check for cleanliness

• **SPEAKING DIAPHRAM:**

- For NORTH equipment, ensure the red O-ring for the speech diaphragm is in place behind the face lens
- Inspect for any imperfections such as worn threads, obstructions, etc.
- Hand tighten the Speech Diaphragm Housing nut if it is loose.

FILTERS:

- Check that the filter is the correctly prescribed filter for the hazard.
- Unscrew the filter and check the threads on the filter ports that they are not worn or cracked.
- Look inside the filter for any debris or foreign particles.
- Check the threads on the filter.
- Check for cracks or any imperfections in the filter housing.
- If applicable, check the ESLI or end service date.
- Reinstall the filter back on the mask.

EXHALATION PORT:

- Remove the Exhalation Valve Guard and inspect for cracks.
- Note: Check the threads on the inside of the Exhalation Valve Guard to ensure they are intact.
- Check the Exhalation Valve Seat for tears, elasticity and/or any deformity.
- Check the threads on the outer lip of the mask exhalation port.
- Inspect the Exhalation Valve Seat to ensure it is intact and there are no obstructions.
- Screw the Exhalation Valve Seat back onto the Exhalation Valve Guard.
- Screw the Exhalation Valve Guard back on to the mask.



QNFT Fit Tester

Job Performance Measure/ Qualification Documentation

Activities qualified to perform: Fit Tester for conducting the mask to face fit of respiratory protection equipment as per OSHA 29CFR1910.134 and ANSI Z88.2 protocols.
Basis used for certification (education, experience, and training)

| | |
|------------------|--------------|
| Candidate's Name | Life Number: |
|------------------|--------------|

Practical Skill Evaluation: Demonstration of Evaluation Methodology by Oral Exam

| Criteria | Qualifying Performance Standard | Unsat. | Recov. | Satisf. |
|--|---|--------|--------|---------|
| 1. Hazardous Waste | Understands the need to treat un-used Isopropanol as hazardous waste if disposing. | | | |
| 2. Set up of Equipment | Knows where equipment needed for the procedure is located and how to properly set it up. | | | |
| 3. Pre-Testing Inspection | Verifies the system is operational with Daily check and HEPA filter. | | | |
| 4. Pre-Test check of employee knowledge | Demonstrates knowledge of how to verify medical approval and training status. Demonstrates knowledge in testing subject on fit checks, defect identification, and donning mask, | | | |
| 5. Use of Equipment | Fully understands the fit test principles at BNL using SOP IH72300 and the computer program. | | | |
| 6. Measurement of hazard | Knows how to properly measure employee fit test and compare to passing criteria. | | | |
| 7. Documentation | Demonstrates correctly filling out records | | | |

I accept the responsibility for performing this task as demonstrated within this JPM and the corresponding SOP.

| | |
|----------------------|-------|
| Candidate Signature: | Date: |
|----------------------|-------|

I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

| | |
|----------------------|-------|
| Evaluator Signature: | Date: |
|----------------------|-------|