Appendix B1-A

ASBESTOS INSULATION BULK SAMPLE COLLECTION AND SUBMISSION PROCEDURE

To determine if the thermal insulation to be handled for repair or rip-out is indeed asbestos, a sample of the material must be submitted to the Industrial Hygiene Department of any NAVENPVNTMEDU, Naval Hospital or Naval Medical Clinic, or to the IHO/safety officer aboard a tender or repair ship for immediate analysis. Following are procedures for collecting a sample suspect asbestos material:

a. Restrict access within 10 feet of the area in which sampling is to be done to only personnel wearing a National Institute for Occupational Safety and Health (NIOSH) approved half-mask air purifying respirator equipped with high efficiency filtering cartridges/filters. Respiratory protection shall be worn by personnel collecting bulk samples of insulation.

b. Secure supply and exhaust ventilation systems in the area.

c. Lightly moisten the cut area with water using a plastic water spray bottle to control asbestos dust while cutting out bulk insulation samples. Adjust the spray to produce a mist, not a straight stream.

d. While cutting into the lagging, hold a disposable plastic bag under the area for collection of any debris.

e. Only a small sample is required for analysis. Carefully cut an approximate 1/2-inch (or quarter size) diameter core through the outer lagging cloth/paste and through the underlying insulation down to the covered metal surface. For soft insulation material, a knife may be appropriate. For hard preformed insulation, a chisel or sharpened screwdriver may be used. A knife is not safe for use with hard preformed insulation since the increased force necessary to penetrate the insulation makes accidental hand contact with the exposed blade a real probability. The ideal coring device is a sharpened steel punch that can be driven into the preformed insulation. Some Navy shipyards have locally fabricated stainless steel borers, modeled after cork borers but substantially strengthened, for this purpose. Whatever device is used for sampling, it must be cleaned after each sample to prevent cross-contamination of samples. For boring tools, cleaning with a wire bore-brush followed by a water wash is recommended. A sample should be submitted for every 10 feet of lagging provided that the material appears to be the same. If there are breaks, seams, or changes in the direction of the lagging, a sample for each section is required. A sample for each type of tile and type of gasket or packing should also be submitted.

f. Using forceps, a spatula, some other instrument or a gloved hand, place the insulation in a 4 by 4-inch polyethylene interlocking seal bag. Label the exterior of the bag as required in paragraph B0104b(3)(b). The bag shall be marked as to location of the sample, command, sampler's name, date of sample and any sample number, if applicable. Fold and place the labeled bag inside another 4 by 4-inch polyethylene interlocking seal bag.

g. After collecting the sample, cover the exposed insulation with duct tape, place respirator in a plastic bag. Respirators should be cleaned per Chapter B6. Cartridges and all rags or material used to wipe down the respirator and/or tools should be immediately disposed of as asbestos waste per B0104d(2). Wash hands, tools and sprayer.

h. The collected sample(s) should be submitted by mail or hand-delivered using the Navy Environmental Health Center Industrial Hygiene sample submission form. This form is found in reference B1-5.

i. Upon receipt, the sample will be analyzed using polarizing light and dispersion staining microscopy, results recorded on the DD 1222 and returned to the requesting command. A return phone call of results may also be arranged.

Appendix B1-B

STANDARD OPERATING PROCEDURES FOR SHIP'S FORCE PROTOCOL

Replacement of Asbestos-Containing Gasket/Packing Material

1. **Scope.** This standard operating procedure covers the repair and/or replacement of asbestos-containing gaskets or packing in pumps or valves and the replacement of asbestos-containing gaskets in pipes.

2. **Stowage.** Store all quantities of asbestos-containing materials (ACM) in sealed impermeable containers and label as asbestos-containing material until needed for repair/replacement per B0104d(1). Similarly stow waste asbestos-containing materials for shore offload. Post storage areas with asbestos warning signs to advise personnel of asbestos presence per B0104b(3)(b).

3. **Personal Protective Equipment**. No personal protective equipment is required for this standard operating procedure.

4. **Procedures**

NOTE:

Do not consume food or beverages, chew gum or tobacco, smoke, or apply cosmetics during asbestos-containing gasket/packing maintenance operations.

a. Use an impermeable drop cloth below the work area.

b. Thoroughly wet the gasket or packing material with water prior to removing. For gaskets, wetting should be accomplished after the joint is loosened.

c. Avoid cutting, abrading, or breaking the gasket or packing material. Remove the gasket or packing material intact, if possible.

d. Place wet gasket or packing material into a disposal container and keep it wet until transferred to a closed receptacle.

NOTE:

A sealable, suitably sized plastic bag may be used for temporary stowage until transferred to an appropriately labeled container.

e. Remove any residue by scraping using wet methods.

NOTE:

Do not use power tools to remove gasket or packing residue.

f. Dispose of gasket or packing material and drop cloth as ACM.

g. Replace all asbestos-containing materials with approved asbestos-free material, if available. If replacement material contains asbestos, prior to cutting new gasket or packing, thoroughly wet gasket or packing material; then cut. Once cut gasket or packing is in place, dispose of residual debris, continuing to use wet methods. Wipe up debris with damp rags. Gasket or packing material that is still useable shall be placed in asbestos-labeled container/bag and properly secured.

NOTE:

Wire-wound (flexitallic) gaskets with asbestos between rings need not be wetted prior to installation.

h. At the conclusion of work, either use a cleaner with a high efficiency, particulate air (HEPA) filter to vacuum all dusty surfaces or wet and wipe them down with a damp rag. Dispose of damp rag(s) as ACM.

i. Clean and decontaminate all tools with damp rags. Dispose of rags as ACM.

j. Personnel shall wash their hands upon completion of gasket or packing repairs/replacements and before eating and drinking, chewing gum or tobacco, or applying cosmetics.

5. **Offload**. Offload the replaced gasket or packing material and any scrap materials as ACM. Handle all rags as asbestos waste. Handle drop cloths as ACM. Once asbestos waste is collected, place in red asbestos labeled bag and thoroughly wet all wastes. Tape off the bag and place in second approved and appropriately-labeled bag (double bag). Seal up the second bag with tape and place in ACM-marked barrel/container for offload. Seal all bags with a “J” or goose-neck seal. Properly label the waste bag per all local requirements.

6. **Medical Surveillance**. Medical surveillance is not required for this operation.

7. **Training**. All personnel performing replacement of asbestos-containing gasket/packing material shall be trained on this standard operating procedure prior to performing any asbestos work. Accomplish training per paragraph B0109 and Appendix B1-E. Training shall be accomplished as follows:

For ships with no Emergency Asbestos Response Team (EART) or Intermediate Maintenance Activity (IMA), this training shall be accomplished by the safety officer or engineering officer as on-the-job training using the Standard Operating Procedures in this appendix.

For ships with an EART, this training shall be accomplished by the safety officer or engineer officer, or a member of the EART that has successfully completed "Shipboard Asbestos Response" (A-760-2166), or Asbestos Supervisor/ Worker (A-493-0069) as on-the-job training using the SOPs in this appendix.

For ships with an IMA, this training shall be accomplished by the safety officer or engineering officer, or a member of the IMA that has successfully

completed "Asbestos Supervisor/Worker", A-493-0069. This will be on-the-job training using the SOPs in this appendix.

This training shall be documented in the member’s service record upon completion.

Appendix B1-B

STANDARD OPERATING PROCEDURES FOR SHIP'S FORCE PROTOCOL

Limited Asbestos Floor Tile Removal

1. **Scope.** This standard operating procedure (SOP) covers removal of a limited amount of asbestos-containing floor tile. Limited amount is defined as nine square feet of tile (approximately nine tiles). The intent of this SOP is operational; not to improve the aesthetics of a space.

2 **Stowage.** Store all quantities of asbestos-containing materials (ACM) in sealed impermeable containers and label as asbestos-containing material until needed for repair/replacement (see B0104d(1)). Post storage areas with asbestos warning signs to advise personnel of the presence of asbestos per B0104b(3)(b).

3. **Personal Protective Equipment**

a. **Respiratory Protection**. No respiratory protective equipment is required for this standard operating procedure.

b. **Gloves**. Wear disposable gloves for this action. Surgical gloves are prohibited.

4. **Procedures**

a. Cordon off an area around the floor tile to be removed using rope or tape and appropriate signs.

NOTE:

Do not consume food or beverages, chew gum or tobacco, smoke, or apply cosmetics in the work area during maintenance operations.

b. Remove the floor tiles from the deck using a putty knife, spatula, or other manual, hand-operated tool. Do not use power tools to remove floor tiles or mastic. Heat guns may be used to remove tiles. Avoid breaking the tiles, if possible.

c. Place removed floor tiles into a suitably colored and marked container.

d. If mastic will be removed from the deck, remove by scraping using wet methods. Mastic remover may be required to remove all mastic. Ensure mastic remover is authorized by checking the Ships Hazardous Material List (SHML) or through written commanding officer authorization.

e. Offload tile and mastic as ACM.

f. Use non-asbestos-containing replacement tiles. If replacement tiles contain asbestos, dispose of tile residue and debris as ACM. Wipe up debris

with damp rags. Tile material that is still useable shall be replaced in asbestos-labeled container/bag and properly secured (see B0104d(1)).

g. At the conclusion of work, either HEPA vacuum all dusty surfaces or wet and wipe them down with a damp rag. Dispose of damp rag(s) as ACM.

h. Remove gloves and dispose of as ACM.

i. Clean all tools and decontaminate with damp rags. Dispose of rags as ACM.

j. Personnel shall wash their hands upon completion of tile/mastic removal action and before eating and drinking, chewing gum or tobacco, or applying cosmetics.

5. **Offload.** Dispose of removed tile and mastic material and any scrap materials as ACM. Handle all rags, disposable clothing, and respirator cartridges as ACM. Once all asbestos waste is collected, place in an impermeable ACM-labeled bag and thoroughly wet waste. Tape off the bag and place in second approved and appropriately-labeled bag (double bag). Seal up the second bag with tape and place in ACM-marked barrel/container for offload. Seal all bags with a “J” or goose-neck seal. Properly label the waste bag per B0104b(3)(b).

6. **Medical Surveillance.** Medical surveillance is not required for this type of operation.

7. **Training.** All personnel performing replacement of limited amounts of asbestos-containing floor tile shall be trained on this standard operating procedure prior to performing the operation. Accomplish training as follows:

For ships with no EART or IMA, this training shall be accomplished by the safety officer or engineer officer as on-the-job training using the Standard Operating Procedures in this appendix.

For ships with an EART, this training shall be accomplished by the safety officer or engineer officer, or a member of the EART that has successfully completed "Shipboard Asbestos Response" (A-760-2166) or Asbestos Supervisor/ Worker (A-493-0069), as on-the-job training using the SOPs in this appendix.

For ships with an IMA, this training shall be accomplished by the safety officer or engineering officer, or a member of the IMA that has successfully completed "Asbestos Supervisor/Worker", A-493-0069. This will be on-the-job training using the SOPs in this appendix.

This training shall be documented in the member’s service record upon completion.

Appendix B1-B

STANDARD OPERATING PROCEDURES FOR SHIP'S FORCE PROTOCOL

Preventive Maintenance on Brake Assemblies

1. **Scope.** This standard operating procedure covers brake planned maintenance system (PMS) on anchor windlass, capstan, and weight handling equipment (hoist, cranes, conveyors, elevators, winches, chainfalls, and come-a-longs) in which brakes are made of asbestos-containing materials.

2. **Stowage.** Store all quantities of ACM in impermeable, sealed containers and label as ACM until needed for repair/replacement. Post storage areas with asbestos warning signs to advise personnel of the presence of asbestos.

3. **Personal Protective Equipment**

a. **Respiratory Protection.** Wear a half-mask air purifying respirator equipped with high efficiency filtering cartridges for this operation. Do not wear single-use disposable respirators. Ensure that the Respiratory Protection Manager (RPM) is fully involved in the selection and fit testing of all respirators.

NOTE:

The command shall train, fit test and ensure that all personnel have been medically cleared to wear a respirator before allowing any personnel to don a respirator.

b. Wear disposable impermeable coveralls (Tyvek® Type II or equivalent) for this action. Seal the coveralls at the wrists, ankles, and neck. Wear disposable gloves to handle asbestos brake assemblies and tape gloves at the wrists.

4. **Procedures**

a. Cordon off the area and hang appropriate signs identifying the asbestos hazard.

NOTE:

Do not consume food or beverages, chew gum or tobacco, smoke, or apply cosmetics in the work area during maintenance operations.

b. During brake maintenance activities, control access to the space in which maintenance is being performed. This may require posting a Sailor at each entrance/exit to the space.

c. Use an impermeable drop cloth in the work area to assist in clean-up.

d. Do not use any equipment or perform any operation that liberates fibers or creates dust, (e.g., dry sweeping or using an air hose in the work area).

e. Before commencing work, either wet the area in which the brake assembly is located or vacuum the area or both, whichever will be required to eliminate asbestos fibers or dust in the area. Use a high efficiency particulate air (HEPA) filter vacuum to ensure the area is thoroughly clean and good housekeeping is maintained.

CAUTION:

Do not use low pressure air to blow dust out of the brake assembly area.

f. Commence preventive maintenance in brake assembly area including repair/replacement of asbestos-containing components. During maintenance, take care not to use power tools that may generate dust. If a power tool must be used, consult either the shipboard assistant safety officer (if aboard)/industrial hygiene officer for further guidance.

g. At the conclusion of work, either HEPA vacuum all dusty surfaces or wet and wipe them down with a damp rag. Dispose of damp rag(s) as ACM.

h. Place all clothing removed in the reverse order it was applied. Dispose of coveralls as ACM.

i. Remove respirator last. Treat cartridges as ACM. The respirator facepiece shall be decontaminated and returned to proper storage.

j. Ensure all tools are cleaned and decontaminated with damp rags. Dispose of rags as ACM.

k. Personnel shall wash their hands upon completion of maintenance action and before eating and drinking, chewing gum or tobacco, or applying cosmetics.

l. Upon completion of all work, the safety officer shall inspect the area using Appendix B3-H prior to allowing general access to the space.

5. **Offload**. Offload the old brake pads and any scrap materials as ACM. Handle all rags, disposable clothing, respirator cartridges, and drop cloths as asbestos waste. Once all asbestos waste is collected, place in impermeable, appropriately-labeled bag and wet thoroughly. Tape off the bag and place in second approved and appropriately-labeled bag (double bag). Seal up the second bag with tape and place in ACM-marked barrel/container for offload. Seal all bags with a “J” or goose-neck seal. Properly label the waste bag.

6. **Medical Surveillance**. Medical surveillance may be required for this asbestos operation. Placement of personnel into the asbestos medical surveillance program (AMSP) is based on past history and/or current exposure or potential exposure to asbestos. Placement into the AMSP is dependent upon industrial hygiene sampling data, and the determination of the Medical Department Representative (MDR).

7. **Training.** All personnel performing brake assembly preventive maintenance shall be trained on this standard operating procedure prior to performing the operation. Accomplish training as follows:

For ships with no EART or IMA, this training shall be accomplished by the safety officer or engineering officer as on-the-job training using the Standard Operating Procedures in this appendix.

For ships with an EART, this training shall be accomplished by the safety officer or engineer officer, or a member of the EART that has successfully completed "Shipboard Asbestos Response" (A-760-2166), or Asbestos Supervisor/ Worker (A-493-0069), as on-the-job training using the SOPs in this appendix.

For ships with an IMA, this training shall be accomplished by the safety officer or engineering officer, or a member of the IMA that has successfully completed "Asbestos Supervisor/Worker", A-493-0069. This will be on-the-job training using the SOPs in this appendix.

This training shall be documented in the member’s service record upon completion.

Appendix B1-C

STANDARD OPERATING PROCEDURES FOR EMERGENCY ASBESTOS RESPONSE TEAM (EART) PROTOCOL

1. **General**

This SOP covers the emergency repair of asbestos-containing lagging. The intent of this SOP is for emergency asbestos lagging repair work, and is not for general maintenance or normal repair of asbestos lagging which must be conducted by an Intermediate Maintenance Activity (IMA) or contractor personnel.

2. **Personal Protective Equipment**

a. **Respiratory Protection**. A half face piece, continuous flow supplied air respirator shall be used.

NOTE

All personnel wearing respiratory protective equipment shall be trained, fit tested, and medically cleared before donning a respirator.

b. **Gloves**. Wear disposable gloves for this action. Surgical gloves are prohibited as an outer glove. Surgical or patient exam latex gloves may be worn as an inner glove during removal operations.

c. **Disposable Sacksuits**. Wear impermeable coveralls (e.g., Tyvek® or equivalent disposable sacksuits) with integral booties and hood.

d. **Boots**. Wear rubber slip-resistant booties over the Tyvek® booties.

e. **Tape**. Duct tape shall be applied to wrists, ankles, and around the respirator and hood opening. While other tapes may work, duct tape is recommended due to its superior adhesive properties.

3. **Procedures**

a. Obtain the commanding officer’s permission to remove asbestos for emergency repair.

b. Brief the EART.

c. Secure or redirect ventilation as necessary.

d. Cordon off the area around the asbestos lagging to be removed using rope or tape and appropriate signs.

e. Suit up team in required PPE ensuring that all openings are taped shut.

NOTE:

Do not consume food or beverages, chew gum or tobacco, smoke, or apply cosmetics during asbestos emergency repairs.

f. Use an impermeable drop cloth (polyethylene) below the work area.

g. Glove bag procedure

(1) Place any tools, encapsulant, etc. into glove bag before beginning securing operations.

(2) Attach glove bag to area being worked. Be sure to securely close all seams on and around the glove bag with duct tape.

(3) The glove bag should be tested for leaks using smoke tubes. Smoke tubes used in respiratory fit test procedures are ideal for this function. If leaks are found, secure with additional duct tape.

(4) Ensure HEPA vacuum and amended water sprayer are attached to appropriate points on the glove bag and taped to prevent leaks. When using HEPA vacuum to obtain negative pressure in a glove bag, it will be extremely difficult to maintain a negative pressure and accomplish work simultaneously. It is recommended that negative pressure be used only upon the completion of the job, and when the glove bag is being removed from the repair site.

h. Thoroughly wet lagging with the amended water prior to and during the removal operation.

i. Remove the lagging as intact as possible.

j. Clean bare pipe and seal off exposed insulation using approved encapsulation methods.

k. Wash and wipe down inside of glove bag from top to bottom to remove potential fiber contamination.

l. Remove any recoverable tools by holding onto them and pulling them out. The glove should now be inside out. Twist the glove and seal with duct tape. Cut glove from glove bag with scissors or sharp knife, and hold for later decontamination.

m. Turn on HEPA vacuum and twist glove bag in the middle below the vacuum hose. Seal with duct tape and cut in two, cutting in the middle of the tape. Place this into an approved and appropriately labeled disposal bag.

n. Disconnect rest of glove bag and place into asbestos disposal bag.

o. Replace all asbestos-containing lagging with non-asbestos containing lagging.

p. Either HEPA vacuum and/or wet and wipe any dusty or potentially contaminated surfaces with a damp rag. Dispose of rags as ACM.

q. Clean and decontaminate all tools with damp rags. Dispose of rags as ACM.

r. Pick up drop cloth and dispose of as ACM.

s. Remove rubber booties and decontaminate with wet rags. Dispose of rags as ACM.

t. Remove the coveralls and dispose of as ACM. It is recommended that the arms be turned inside out, then roll the suit down the body, and pull the legs inside out. This keeps contamination on the suit and away from the body.

u. Remove gloves by turning them inside out, and dispose of as ACM.

v. Remove respirator and decontaminate using warm soapy water.

w. Personnel shall shower upon completion of asbestos removal action and before eating and drinking, chewing gum or applying cosmetics.

4. **Disposal.** Dispose of glove bag, PPE, any scrap materials, all rags, and drop cloths as ACM. Once ACM is collected, place in an impermeable bag and thoroughly wet all wastes. Tape off the bag and place in a second approved and appropriately labeled bag (double bag). Seal up the second bag with tape and place in asbestos waste barrel/container for offload. Seal all bags with a "J" or goose neck seal.

5. **Medical Surveillance.** Medical surveillance is required for the EART.

6. **Training.** Personnel designated to be on the EART shall be trained through the 2-day Shipboard Asbestos Response (A-760-2166) or Asbestos Supervisor/ Worker (A-493-0069) offered through the Naval Occupational Safety and Health, and Environmental Training Center (NAVOSHENVTRACEN).

7. **Conflicts.** Application of asbestos-control requirements shall not be allowed to compromise the requirements for control of radioactive contamination in naval nuclear-powered ships as contained in NAVSEA 0389-LP-028-8000, Radiological Controls for Shipyards. Should conflicts be discovered, submit a proposed resolution to COMNAVSEASYSCOM (SEA 08).

Appendix B1-D

STANDARD OPERATING PROCEDURES FOR THE IMTERMEDIATE MAINTENANCE ACTIVITY ASBESTOS WORK PROTOCOL

This standard operating procedure (SOP) for the IMA is generated from the Asbestos Supervisor/Worker Course (CIN: A-493-0069).

1. **General**

This SOP covers large-scale repair and removal of Thermal System Insulation (TSI), surfacing Asbestos Containing Materials (ACM), or Presumed Asbestos Containing Materials (PACM) inside a negative pressure enclosure (NPE).

2. **Tools, Equipment and Materials**

a. **Personal Protective Equipment (PPE)**:

(1) Disposable impermeable coveralls (Tyvek® 1422A or equivalent), with integral head and foot coverings

(2) Rubber outer gloves and inner cotton gloves

(3) Cloth work coveralls may be worn under disposable coveralls during operations conducted in low temperatures

(4) Non-slip rubber overshoes.

(5) Respirator requirements shall be determined by the Respiratory Protection Manager (RPM). Minimum required respiratory protection shall consist of a half mask, negative pressure respirator equipped with HEPA (P100) cartridges.

NOTE:

The new OSHA Respiratory Protection Standard designates HEPA-equivalent cartridges as P100.

Detailed information regarding PPE required for this work is found in Appendix B1-J.

b. **Ventilation**. HEPA filtered exhaust (local or general area) sufficient to place the NPE under at least - 0.02 inches of water (as measured on a magnehelic gauge) and at least four air changes per hour. The number of negative air machines required to meet this requirement is dependent upon the volume of the NPE.

c. **Tools and Equipment**:

(1) Spray bottle and/or other dispensing devices with amended water

(2) Smoke generator or smoke tubes for small enclosures, to test the integrity of the NPE

(3) Asbestos warning signs

(4) Asbestos labels

(5) Approved, HEPA filtered vacuum cleaners labeled "Asbestos Use Only"

(5) Impermeable asbestos waste bags at least 6 mil thick

(6) Duct tape or equivalent

(7) Varying amounts of 6-mil sheet poly material.

d. **Forms**:

(1) Asbestos Regulated Area Sign -In/Out Log

(2) Qualified persons training certificate

(3) Supervisors Certification of Cleanup Following Work

(4) Bridging encapsulant, if necessary.

3. Prerequisite Tasks. Prior to beginning the work covered by this SOP, consideration must be given to lockout/tagout requirements, confined space entry requirements and the provision of a safe work area.

a. Critical Watchstanders, personnel who must remain in the immediate area, due to watchstanding requirements, where asbestos repair or removal is being conducted, are required to wear the same PPE as those personnel performing the asbestos work. Prior to donning the PPE, personnel must be trained per B0121 and Appendix B-G.

NOTE

All personnel wearing respiratory protective equipment shall be trained, fit tested, and medically cleared before donning a respirator.

b. Secure all ventilation in the space. If ventilation cannot be secured, redirect it away from the NPE.

c. A minimum of Grade D breathing air is required when supplied air respirators are used.

4. Employee Briefing. Prior to beginning the work covered by this SOP, all personnel must be briefed on the following safety consideration:

a. Heat stress

b. Buddy System

5. IMA Asbestos Removal Work Procedures

a. **Obtain Background Samples**. An industrial hygienist, or other person qualified to perform asbestos sampling, shall take background air samples prior to starting set-up operations. If sample analysis is greater than 0.01 f/cc (fibers per cubic centimeter), then the space shall be isolated and placed under asbestos controls.

b. **Establish a Regulated Area**. (The regulated area does not need to be established until just prior to commencement of asbestos removal operations.).

(1) Isolate the work area by erecting a Negative Pressure Enclosure (NPE):

(a) Configure NPE in a manner to accommodate the material, equipment, and personnel needed for the removal project.

(b) Construct enclosure of 6-mil poly material.

(c) Lock out/tagout HVAC systems within the regulated area. Isolate HVAC systems and openings (duct, diffusers, etc.) within the regulated area by sealing with two layers of 6 mil poly or equivalent material. Cover other critical barriers with at least one (1) layer of 6 mil poly material.

(d) Lock out/tagout electrical systems within the NPE.

(e) Install all necessary services such as water, vacuum hose, negative air machine, staging, ventilation, breathing air, and exterior/ interior lights. All electrical equipment used in the NPE shall be connected to a ground fault circuit interrupter (GFCI).

(f) Post the regulated area, the entrance to the vestibule and the entrances to the decon area/buffer zone with asbestos warning signs, as well as other areas of potential access.

(2) Post a copy of the qualified persons training certificate at the regulated area.

(3) The qualified person shall supervise the construction of the NPE. Additionally, the qualified person shall be present for the entire time the boundary is established, associated services are established, during operation of the NPE, and during cleanup and disestablishment of the regulated area.

(4) Wrap all equipment and any object that cannot be readily removed from the NPE (e.g., all HVAC systems) in 2 layers of 6-mil poly material. Pre-clean with wet methods.

(5) Establish the asbestos decontamination area:

(a) Construct decontamination area of poly material adjacent to and connected to the NPE.

(b) The decontamination area shall consist of an equipment room, shower area, and clean room.

NOTE:

Showers may be omitted if demonstrated not to be feasible. However, every effort should be taken to establish an alternate location for showers.

(c) Provide impermeable, labeled bags and containers in the equipment room for the containment and disposal of contaminated clothing and other equipment.

c. Asbestos work operations cannot begin until demonstrated negative pressure has been established.

(1) HEPA filtered exhaust ventilation (local or general area) sufficient to place the area under negative pressure of at least - 0.02 inches of water (as measured on a magnehelic gauge) shall be maintained.

(2) The NPE shall be kept under negative pressure throughout the period of its use.

(3) The NPE will be smoke tested prior to operations and at the beginning of each work shift to ensure negative pressure is sustained during work.

(4) Air movement shall be directed away from employees performing asbestos work within the enclosure, and toward a HEPA filtration or a collection device.

(5) Maintain air movement at a minimum of four air changes per hour.

d. Initiate the Hazardous Area Sign-In/Out Log and ensure that personnel sign in and out.

e. The IHO shall monitor the work operation upon completion of setting up the regulated area. General area air sampling shall be collected at the boundary of the regulated area. Personal air sampling is also required.

5. <u>Work Practices Within the Regulated Area</u>

a. Install a drop cloth on the floor of the enclosure under the material to be removed. Secure with duct tape or equivalent.

b. Wet all asbestos material with amended water during all phases of the removal process. Ensure that power tools are not used during the removal process.

c. Personnel should start removal operations close to the decontamination area, and work toward the source of exhaust ventilation.

d. The qualified person shall inspect the job site at least once per work shift.

e. Encapsulate any exposed asbestos material prior to removal of NPE.

6. Regulated Area Disestablishment

a. Remove gross contamination from wall coverings or remove the inner contaminated layer of poly material.

b. Remove gross contamination from equipment in the work area. This includes the negative air machine, scaffolding, ladders, extension cords, hoses, and other equipment inside the work area. This can be accomplished using a combination of HEPA vacuuming and wet methods.

c. Remove the top layer of 6-mil poly material used to cover the floor area after appropriate cleaning. Carefully fold it inward into compact bundles for bagging and disposal.

d. Conduct a visual inspection of all surfaces and reclean if necessary. Flashlights and inspection mirrors are good for this process.

e. Perform a final wipe-down of equipment and remove from the work area.

f. HEPA vacuum any remaining hard-to-reach places such as crevices around doors and shelves.

g. Detach the poly material floor covering from the wall and carefully fold inward into a compact bundle for bagging and disposal.

h. After the floor is uncovered, clean corners and crevices with a HEPA vacuum.

i. Wet-wipe and/or vacuum the walls. Begin cleaning the areas farthest from the negative air machine, and work toward it using amended water to wet wipe all exposed surfaces.

j. Wet mop floors using amended water. Be sure to change water frequently.

k. The asbestos removal supervisor shall re-inspect the NPE to verify there is no visible asbestos debris present. If the area is clean, obtain supervisor’s signature per Appendix B1-H, Workplace Release Checklist.

l. Conduct final clearance monitoring prior to disestablishment of the NPE. Ensure the HEPA-filtered exhaust ventilation is operational during this process.

m. If samples pass final clearance, remove outer layer of poly material and all critical barriers, disconnect negative air machine(s), and allow for reoccupancy.

n. Clean up, decontaminate, and disassemble the decontamination unit.

o. Place all ACM, containment materials, scrap, debris, bags, containers, equipment which cannot be decontaminated, rags, and asbestos contaminated clothing into approved and appropriately labeled impermeable bags and “J” seal. Prior to placing in bag, wet the asbestos waste to reduce airborne concentrations. Prior to sealing the bags, evacuate all air from the disposal bag using a HEPA vacuum.

p. Upon receiving the sample results, complete Appendix B1-H, Workplace Release Checklist. Forward this form along with the Hazardous Area Sign-In/Out Log to the Industrial Hygiene Officer.

Appendix B1-E

TRAINING REQUIREMENTS FOR SHIP'S FORCE PROTOCOL

Navy Personnel Training Requirement	Citation	Course Title/Training Required	Requirement	Formality	Resource for Training	Length of Training	Periodicity
All personnel performing non-friable asbestos work: • Limited asbestos-containing floor tile removal • Asbestos-containing gasket replacement • Asbestos-containing brake assembly maintenance	B0104g	Asbestos removal procedures detailed in Appendix B1-B	Mandatory	Informal	For ships with no EART or IMA (**See NOTE [1]**) For ships with an EART (**See NOTE[2]**) For ships with an IMA (**See NOTE [3]**)	TBD	On-the-job training
All personnel performing preventive maintenance on brake assemblies	Appendix B1-B, Chapter B6	Respirator fit-testing, selection, and maintenance	Mandatory	Informal	RPM	TBD	Prior to donning a respirator, and annually thereafter

Detailed information regarding class schedules, quotas, etc. can be found on the NAVOSH ETC website at http://www.norva.navy.mil/navosh

NOTE [1] **For ships with no Emergency Asbestos Response Team (EART) or Intermediate Maintenance Activity (IMA)**, this training shall be accomplished by the safety officer or engineering officer as on-the-job training using the Standard Operating Procedures in Appendix B1-B.

NOTE [2] **For ships with an EART**, this training shall be accomplished by the safety officer or engineering officer, or a member of the EART that has successfully completed “Shipboard Asbestos Response” A-760-2166, or Asbestos Supervisor/Worker (A-493-0069) as on-the-job training using the Standard Operating Procedures in Appendix B1-B.

NOTE [3] **For ships with an Intermediate Maintenance Activity (IMA)**, this training shall be accomplished by the safety officer or engineer officer, or a member of the IMA that has successfully “Asbestos Supervisor/Worker”, A-493-0069, as on-the-job training using the Standard Operating Procedures in Appendix B1-B.

Appendix B1-F

TRAINING REQUIREMENT FOR ASBESTOS-RELATED WORK

Emergency Asbestos Response Team

Navy Personnel Training Requirement	Citation	Course Title/Training Required	Requirement	Formality	Resource for Training	Length of Training	Periodicity
EART Personnel performing glove bag asbestos removal	B0114	"Shipboard Asbestos Response" A-760-2166	Mandatory	Formal Classroom	NAVOSHENVTRACEN	2 days	Initially. No refresher required.
EART Personnel performing glove bag asbestos removal	Appendix B1-C Chapter B6	Respirator fit-testing, selection, and maintenance	Mandatory	Informal	RPM	TBD	Prior to donning a respirator, and annually thereafter

Detailed information regarding class schedules, quotas, etc. can be found on the NAVOSH ETC website at http://www.norva.navy.mil/navosh

Appendix B1-G

TRAINING REQUIREMENT FOR ASBESTOS-RELATED WORK

Intermediate Maintenance Activity Personnel

Navy Personnel Training Requirement	Citation	Course Title/Training Required	Requirement	Formality	Resource for Training	Length of Training	Periodicity
Engineering/Repair IMA Personnel performing unlimited asbestos repair/removal	B0121a	Asbestos Supervisor/Worker, A-493-0069	Mandatory	Classroom	NAVOSHENVTRACEN	5 days	Prior to performing any asbestos repair/removal operations.
Engineering/Repair IMA Personnel performing unlimited asbestos repair/removal	B0121a	Asbestos Supervisor/Worker Refresher, A-493-0070	Mandatory	Classroom	NAVOSHENVTRACEN	1 day	Annually (1 year from the successful completion of A-493-0069) for as long as personnel perform work under this protocol.
Engineering/Repair IMA Personnel performing unlimited asbestos repair/removal	Appendix B1-D, Chapter B6	Respirator fit-testing, selection, and maintenance	Mandatory	Informal	RPM	TBD	Prior to donning a respirator, and annually thereafter
Other Related Training							
IHO	B0119a(4)	Analysis of Bulk ID Samples B-322-2334 or Equivalent	Mandatory	Classroom or Equivalent	EPMU or Equivalent	5 days	No refresher required. However, required to successfully participate in Proficiency Analytical Testing Program/RTI Program
IHO	B0119a(4)	Analysis of Airborne Asbestos Samples (B-322-2333) or 582 equivalent	Mandatory	Classroom or 582 equivalent	EPMU or Equivalent	5 days	No refresher required, However, required to successfully participate in Proficiency Analytical Testing Program

This training shall be documented in the service member's service record upon completion

Detailed information regarding class schedules, quotas, etc. can be found on the NAVOSH ETC website at http://www.norva.navy.mil/navosh

Appendix B1-H

WORKPLACE RELEASE CHECKLIST

Upon completion of an asbestos repair or removal, use this checklist to inspect the asbestos work area. This inspection is a critical part of the asbestos removal operation. Failure to satisfactorily complete the inspection, which includes correction of all deficiencies observed, may result in asbestos exposure long after the project is completed. Complete this inspection prior to disestablishment of the asbestos work area. The department performing the asbestos work must retain a copy of the checklist with other records of the removal.

Provide the inspector with a standard flashlight equipped with fresh batteries, a complete set of personal protective equipment, including respirator (where applicable), required for entry into the asbestos work area. Do not begin the inspection until all surfaces within the regulated area are dry and visibly cleared of dust and debris to ensure that any contamination can be observed.

Inspector: _____ Last 4: (SSN) _____
Asbestos Removal Team Supervisor: _____
Date: _____ Time: _____
Area Inspected: _____
Ship's Name: _____ Hull No.: _____

		SAT	UNSAT
1	**All** surfaces within the regulated area are free of visible dust and debris. Use mirrors, flashlights, and other tools to accomplish this inspection. Inspect cable ways to the extent possible without disturbing the wires.		
2	Asbestos work area is still secured and properly posted.		
3	All asbestos waste is properly sealed in leak tight containers that are labeled with proper warning label (paragraph B0104b(3)(b).		
4	All asbestos containing material that was to have been removed has been removed.		
5	Surfaces exposed by the asbestos removal operation are free of **all** visible contaminants, rust, and scale. If rust and scale are present and can not be removed they must be encapsulated. This inspection requires that the exposed surface be disturbed to see if there is any residue. This may be accomplished with a screw driver, scratch awl,		

		SAT	UNSAT
	or other pointed device.		
6	IMA protocol only – The project is considered complete if samples collected are no greater than 0.01 f/cc or background, whichever is greater, as measured prior to starting the non-emergency asbestos abatement, but never greater than 0.1 f/cc.		

I certify that the inspection is satisfactory and the regulated area may be released from asbestos controls for unrestricted access.

Signature: _____ Date/Time: _____

Signature Authority:

IMA Protocol: Safety Officer or IHO signature required
EART Protocol: Safety Officer signature required
Ship's Force Protocol: Department Head or Division Officer

Appendix B1-I

PERSONAL PROTECTIVE AND SPECIAL EQUIPMENT

Ship's Force Performing Non-Friable Asbestos Repair and Removal

Operation	Required Personal Protective Equipment				Special Equipment
	Hood	Respirator	Gloves	Tyvekâ (or equivalent) Coveralls	HEPA Vacuum
Limited Floor Tile/Mastic Removal			√		√
Brakes/Clutch Assemblies	√	√*	√	√	√
Replacement of Gaskets/Packing materials					√

* For work covered by this protocol, the worker will wear a half face, air-purifying respirator with high efficiency filtering cartridge. The RPM will determine the type of respirator required for each work process.

Type, quantity, specific ordering information for this PPE is found in Appendix B1-J

Gloves: Use medium weight rubber gloves with a thin cotton "under glove" to absorb perspiration.

See Appendix B1-J for Navy Stock Numbers (NSNs) for this and all associated PPE and equipment.

NOTE:

Critical watchstanders, personnel who must remain in the immediate area, due to watchstanding requirements, where asbestos repair or removal is being conducted, are required to wear the same PPE as those persons performing the asbestos work.

Appendix B1-J

AUTHORIZED EQUIPPAGE LIST FOR ASBESTOS WORK PROTOCOLS

AEL 2-330024045

NOMENCLATURE	NSN	U/I	SHIP'S FORCE	EART	IMA
Bag, Disposal Red Plastic 55 GAL Cap	8105-01-086-5053	BX	1	1	5
Cooling Assembly	4240-01-083-3399	KT	0	3	6
Ambient Air Breathing Apparatus, Electric	4320-01-106-4121	EA	0	0	2
Warning Signs	9905-01-345-4519	EA	OAR*	OAR*	OAR*
Coveralls, Disposable, sacksuit w/shoes and hood, Large	8415-01-092-7531	BX	0	1	2
Coveralls, Disposable, sacksuit w/shoes and hood, X-Large	8415-01-092-7532	BX	0	1	2
Glove Inserts, Surgeons	6515-01-354-3157	PG	10	20	100
Gloves, Clean Room, Medium	8415-01-399-0704	PG	10	20	100
Gloves, Clean Room, Large	8415-01-399-0702	PG	10	20	100
Overshoes, Rubber Medium	8430-00-421-7487	PR	0	6	18
Overshoes, Rubber Large	8430-00-421-7488	PR	0	6	18
Overshoes, Rubber X-Large	8430-00-421-7489	PR	0	6	18
Sprayer, Insecticide	3740-00-191-3677	EA	0	1	3
Spray Bottle, Plastic	8125-00-488-7952	EA	4	4	24
Duct Tape	5640-00-103-2254	RO	0	20	100
Plastic Sheeting, 6 mil	8135-00-579-6486	RO	0	2	10

NOMENCLATURE	NSN	U/I	SHIP'S FORCE	EART	IMA
Paper Towels, Absorbent	7920-00-823-9772	BX	1	2	5
Finger Grip Saw	5110-00-570-6896	EA	0	2	4
Keyhole Saw	5110-00-142-5010	EA	0	2	4
Nylon Brush	7920-00-324-2746	EA	0	2	4
Scouring Pad	7920-00-753-5242	EA	0	3	10
EAB Modification Kit for Submarines	4240-01-077-5994	EA	0	6	0
Ventilation Smoke Tube Kit (for glovebags)	MSA 458481	EA	0	1	2
Glass Smoke Tubes (10/PKG)	MSA 5645	PG	0	2	6
Negative Air Unit, Abatement Technologies, HEPA-Aire 1000, Part Number H1000V Replacement Parts: H1001 Primary Filter Pads, 30/cs. H1002-12 Pleated Secondary Filters, 12/cs. H1010E Wood Frame 99.97% HEPA, 1/cs.	Open Purchase: Abatement Technologies 3305 Breckenridge Blvd. #118 Duluth, GA 30136 1-800-634-9091	EA	0	0	2
Magnehelic Gauge	6685-00-910-6964	EA	0	0	1
HEPA Vacuum: Hako Minuteman Wet/Dry, 15-gallon capacity; C83985-05/-16. Replacement parts: *800317 Crush-proof Hose *800015 Wand (Operator's Handle) *800070 Gulper Tool *800024 Round Dust Brush *800116 Swivel Connector *110121PKG Impact Filters (12/Pkg.) *805037PKG Plastic Bags (12/Pkg.) *805038PKG Filter Protectors (12/Pkg.)	GSA Contract Number: GS-07F-8158B	EA	0	0	1

NOMENCLATURE	NSN	U/I	SHIP'S FORCE	EART	IMA
110010 HEPA Filter Replacement (85" Water Lift) Lid Assembly 110001 HEPA Filter Replacement (105"/130" Water Lift) Filter Replacement *Note: Items with an asterisk (*) are included as part of No. 800109, Wet/Dry Tool Kit 30B. **OR**					
HEPA Vacuum: Nilfisk VT60 Wet/Dry, 5 to 15-gallon capacity; *01799350/375101 Replacement Parts: *01722601 Impact Filter (washable) *017383 Main Filter Finger Tubes (washable) *616821 Microfilter *017840 Trolley Assembly *01727631 HEPA Cartridge *017196 10-foot Plastic Hose (1.5") *017193 Double-Curved Aluminum Wand *017192 14-inch Wheeled Floor Nozzle *0171941 3-inch Aluminum Dust Brush *017195 11-inch Plastic Crevice Nozzle *017191 Container Polyliners (25/Pkg.) *Note: Items with an asterisk (*) are included as part of item number 01799350/375101.	GSA Contract Number: GS-07F-8356C	EA	0	0	1
HEPA Vacuum: Nilfisk GM80 HEPA-Filtered Vacuum System, 3-gallon capacity; *01790133/375102 Replacement Parts: *118274 Power Cord for Grounded Motor *115470 Detachable Trolley for GM80 Canister *01709600 Positive-Twist Safety Latches *120975 78-inch Tapered Plastic Hose with Curved Tube *111124 Straight Steel Wands	GSA Contract Number: GS-07F-8356C	EA	1	1	1

NOMENCLATURE	NSN	U/I	SHIP'S FORCE	EART	IMA
*120410 Combination Floor Nozzle *11276901 3-inch Round Dust Brush *811409 6-inch Crevice Nozzle *320437 5-inch Upholstery Nozzle *816200 2-Ply Disposable Paper Bags (5/Pkg.) *616821 Microfilter *01710440 HEPA Filter Assembly *017190 Container Poly Liners (25/Pkg.) **01702425 Variable Speed Control *Note: Items with an asterisk (*) are included as part of item number 01790133/375102. **Note: This item is optional, and is not included as part of item number 01790133/375102. However, it is recommended when performing glove bag operations.					

NOTE: See Appendices B1-I for PPE requirements for Ship's Force Protocol, B1-K for requirements for PPE requirements for Emergency Asbestos Response Team Protocol, and B1-M for PPE requirements for Intermediate Maintenance Activity Protocol.

***OAR – Order As Required**

Appendix B1-K

PERSONAL PROTECTIVE AND SPECIAL EQUIPMENT

Emergency Asbestos Response Team Performing Glove Bag ACM Removal

	Required Personal Protective Equipment						Special Equipment			
	Tyvekâ or Equivalent									
Operation	**Coveralls**	**Hood**	**Booties**	**Z-87 Safety Goggles**	**Respirator**	**Gloves**	**HEPA Vacuum**	**Cooling Assembly**	**Finger Grip Saw**	**Keyhole Saw**
Glove Bag Procedures ONLY										
<3 linear feet of pipe insulation or 1 square foot of insulation on surfaces other than pipes	√	√**	√**	√	√*	√	√	√	√	√

* The RPM will determine the type of respirator required for each work process. If the concentration of airborne asbestos is unknown, use a full-face, continuous flow supplied air respirator. The Self Contained Breathing Apparatus (SCBA) respirator meets this requirement.

** Type II Tyvek® (or equivalent) coveralls have hood and booties attached, therefore, separate hoods and shoe coverings are not required with this PPE.

Type, quantity, specific ordering information (NSN information) is found in Appendix B1-J. Information contained in Appendix B1-J is taken from AEL 2-330024045.

Gloves: Use medium weight rubber gloves with a thin cotton "under glove" to absorb perspiration.

See Appendix B1-J for the National Stock Numbers (NSNs) for this and all associated PPE and equipment.

Appendix B1-L

ASBESTOS REPAIR OR REMOVAL PREWORK BRIEF

To be conducted jointly between the IMA and the vessel receiving asbestos repair or removal support.

Prior to conducting asbestos repair or removal operations on a ship, the IMA will conduct a pre-work briefing with the engineer officer, safety officer, division officer and/or workcenter supervisor of the department of the ship receiving the asbestos work.

The briefing will include at least the following:

1. A listing of all spaces that will be affected by the asbestos work. These will include the spaces used for shower facilities if they are required.

2. A discussion of the asbestos controls that will be used to accomplish the work. This will include:

    a. The exact location of the asbestos regulated area boundaries

    b. The requirement to secure ship’s ventilation in the area of the removal operation and its effect on the ship and personnel

    c. Disposal of any waste generated and who will be responsible for its disposal. Normally this will be the receiving ship

    d. Air monitoring that will be accomplished and how the results of the general area monitoring will be conveyed to the receiving ship.

3. A discussion of any vital watchstanders the receiving ship may require to remain in the asbestos regulated area. The IMA and the receiving ship will mutually agree to the need for these watchstanders.

4. The planned times that the asbestos area will be isolated and entry restricted.

5. Any additional aspects of the planned work that either party feels should be discussed.

Appendix B1-M

PERSONAL PROTECTIVE AND SPECIAL EQUIPMENT

Intermediate Maintenance Activity Performing Extensive Removal and Repair of ACM

Operation	Required Personal Protective Equipment						Special Equipment					
	Tyvekâ or Equivalent											
	Coveralls	Hood	Booties	Z-87 Safety Goggles	Respirator	Gloves	HEPA Vacuum	Cooling Assembly	Finger Grip Saw	Keyhole Saw	Negative Air Unit	Magnehelic Gauge
Removal or repair of unlimited quantities of ACM	√	√**	√**	√	√*	√	√	√	√	√	√	√

* The RPM will determine the type of respirator required for each work process. If the concentration of airborne asbestos is unknown, use a full-face, continuous flow supplied air respirator. The Self Contained Breathing Apparatus (SCBA) respirator meets this requirement.

** Type II Tyvek® (or equivalent) coveralls have hood and booties attached, therefore, separate hoods and shoe coverings are not required with this PPE.

Type, quantity, specific ordering information is found in Appendix B1-J. Information contained in Appendix B1-J is taken from AEL 2-330024045.

See Appendix B1-J for the National Stock Numbers (NSNs) for this and all associated PPE and equipment.

Gloves: Use medium weight rubber gloves with a thin cotton "under glove" to absorb perspiration.

NOTE:

The proper use of protective clothing requires that all openings be closed and that garments fit snugly about the neck, wrists, and ankles. Accordingly, tape the wrist and ankle junctions, as well as the collar opening on the outer disposable coveralls to prevent contamination of skin and underclothing without restricting physical movement.

NOTE:

Critical watchstanders, personnel who must remain in the immediate area, due to watchstanding requirements, where asbestos repair or removal is being conducted, are required to wear the same PPE as those personnel performing the asbestos work, and at least a half-mask, air purifying respirator with a high efficiency filtering cartridge.

FOR SUBMARINES

Personnel performing asbestos work shall wear an emergency air breathing (system) (EAB) modified to replace the demand regulator (see AELs 2-330023-47, 2-33034070, and 2-330024045 for EAB kit information). Watchstanders in the same compartment as the work being performed may wear an unmodified EAB mask.