UNITED STATES GOVERNMENT

Memorandum

IN REPLY REFER TO
6153F:ALM:llb
Ser 1683
22 September 1969

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From: SEC 6153

To: SEC 6101

Subj: Asbestos; Hazards of

Ref : (a) NAVSEC PHILADIV 6764:MA:jed 9390 (FA-287) Ser 1383 of 20 Aug 1969
(b) MIL-I-15091
(c) MIL-STD-769
(d) MIL-I-16411
(e) MIL-I-23128
(f) MIL-C-20079
(g) MIL-I-15349
(h) MIL-I-2781
(i) MIL-I-24244

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1. We concur in the recommendation of reference (a) with regard to reference (b) material and will take action to delete reference (b) from reference (c) and substitute references (d) and (e).

2. Before implementation of the recommendations of reference (a) with regard to piping and machinery insulation by revision of reference (c), resolution of the following comments is requested:

a. In the matter of removable and reusable covers, if we substitute glass felt for asbestos felt, why should we not also substitute glass cloth for asbestos cloth? This will require evaluation of reference (f) with the current state of the art of glass weaving and revisions to insure acceptable materials which will not cause skin irritation. At present reference (f) has no definitive requirements for control of fiber quality. According to Johns-Manville and EUHED there is no known difference between the hazards of chrysotile (weaving fibers) and amosite (felting fibers). However, The American Academy of Occupational medicine: reported in September 1967 that chrysotile disappears more readily from the lungs than other forms. Lint or dust from cloth may be as hazardous as from felt. This also applies to thermal insulation tape per reference (g). Could not the jacket be glass in lieu of asbestos?

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b. The above comments also apply to lagging cloth. Glass cloth cannot be ripped as can asbestos but this should cause only minor problems since it is understood that most lagging cloth is pre-cut.

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c. All manufacturers use asbestos in the production of reference (h) material and therefore present possible asbestos hazards. Johns-Manville has been unsuccessful in attempts to substitute glass in this application due to the deleterious effects of calcium silicate upon glass fibers. Grades C and F of reference (h) (unibestos) contain about 90 percent asbestos fibers while Grades B, D and E contain 10 to 15 percent asbestos. The amount of dust to be expected from fabrication or rip-out of these various classes has not, to the knowledge of the writer, been documented. If Grade D material produces 8 or 9 times as much dust as Grade C material, which is the more hazardous? The recommendation to arbitrarily stop use of Unibestos based solely upon asbestos content while calcium silicate usage is continued does not appear to be justified. Furthermore, Unibestos and several asbestos cloths and felts were found to be acceptable under the special corrosion and chloride requirements of reference (i) for prevention of stress corrosion cracking of Austenitic stainless steel. This statement has been documented by E.I. duPont deNemours at their own expense and by Knowles Atomic Power Laboratory for SHIPS 08. To eliminate use of asbestos will require extensive revision of reference (i).

2. Upon resolution of the above a firm position may be rationally established and maintained independent of bad publicity generated by Dr. Selikoff's statements in the Washington Post and Daily News which apparently did not reflect his true position on the subject. The good doctor has also been quoted as saying "The problem is a serious one for insulation workers at present. However, since we have discovered and defined this risk, it has also become evident that it can be removed. That is the purpose of this new program. Analysis of the problem made it evident that today's solution is the proper one. Environmental health difficulties are too widespread and too diffuse to be encompassed by any one group. Their cause — and cure — require the broad cooperation of industry, labor, science and government." This statement, made upon receipt of $362.5K for the first year of a 5 year project on industrial health research is not nearly as sensational as the one in the Washington newspapers.

3. Removal of asbestos from the system will in no way lessen the need for protection of respiratory organs from dust resulting from handling insulation. The U.S. Public Health Service and the U.S. Coast Guard are not greatly concerned and apparently plan no action on the subject. Perhaps the Navy should lead the way. We may get as far with elimination of asbestos as the Surgeon General got with elimination of cigarette smoking. Congress may pass a law against import of asbestos.

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Copy to:
SEC 6101C, SEC 6124, SEC 6764

NAVAL SHIP ENGINEERING CENTER, PHILADELPHIA DIVISION
PHILADELPHIA, PA. 19112

IN REPLY REFER TO
6764:MA:lal
9390(FA-287)
Ser 1584

24 SEP 1969

From: Officer in Charge, Naval Ship Engineering Center, Philadelphia Division
To: Commander, Naval Ship Engineering Center

Subj: Survey of Hazards of Asbestos; final report of NAVSECPHILADIV Project FA-287

Ref: (a) NAVSEC ltr 6101C:EC:an, 9390, Ser 278 of 7 Apr 1969
(b) NAVSECPHILADIV ltr 6764:MA:lal, 9390(FA-287), Ser 656 of 24 Apr 1969
(c) NAVSECPHILADIV ltr 6764:MA:lal, 9390(FA-287), Ser 1189 of 30 Jul 1969
(d) NAVSECPHILADIV ltr 6764:MA:lal, 9390(FA-287), Ser 1273 of 6 Aug 1969
(e) NAVSECPHILADIV ltr 6764:MA:lal, 9390(FA-287), Ser 1300 of 13 Aug 1969
(f) NAVSECPHILADIV ltr 6764:MA:jy, 9390(FA-287), Ser 1417 of 26 Aug 1969
(g) NAVSHIPS Tech Manual Chapter 9390, Thermal Insulation of Sep 1967
(h) MIL-STD-769C (SHIPS) of 15 Nov 1967, Thermal Insulating Requirements for Machinery and Piping

1. Background

a. The enormous rise in the production and industrial uses of asbestos during the past 60 years has resulted in a markedly widened exposure to asbestos dust for a greatly increased number and variety of workers. Some of them, moreover, sustain accidental contacts either when being employed in various capacities in operations where asbestos products are processed, used, or handled, or when working in plant areas in which an environmental pollution of the air with asbestos exists. The harmful effects of such growing exposures to asbestos during the past two decades are reflected in an increased number of reports on the occurrence of asbestosis and asbestos cancer (mesothelioma) in a variety of asbestos workers from a rising number of countries. The principal worker groups exposed to respiratory contact with asbestos are employed in the asbestos mining and milling industries, in the production and commercial use of asbestos cement and plaster, in the production and application of asbestos for insulating purposes and in

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the processing of asbestos and its manufacture into textiles. Ensuring adequate protection of asbestos workers against occupational health hazards related to respiratory and cutaneous contact is of paramount importance to Government, industry, and the workers themselves.

b. Since individual habits of workmen play a large part in their exposure patterns, observations of their practices have been included in the survey. Most insulation workers are aware that exposure to asbestos dust, even at low concentrations, is hazardous but they also feel that the hazards are unavoidable and must be accepted as part of the occupation. Moreover, a recently published survey conducted by a naval shipyard aboard selected ships has revealed that, although dust respirators have been required during installation or ripout of asbestos, 76% of the workers did not use them. In fact 50% did not possess respirators even though they were readily available at central tool rooms. This lack of worker discipline and the seriousness of the lung effects of asbestos could be the main deciding factors for considering the elimination of asbestos as a lagging material and as a cement on piping, ducts and boilers and thus reduce and eventually eradicate the reported incidence of asbestosis ranging up to 21% among shipyard insulation workers.

c. One recent shop and ship time study has revealed that laggers currently occupy 45% of their working time with asbestos-containing materials. This survey also reported that the individual duties of insulation workers required the following time allotment:

(1) 10% of the laggers' time involved prefabrication procedures such as the hand or power cutting of molded pipe covering or blocks and their shaping to fit the intended area of application.

(2) 40% of the time is spent in the application operation including fitting, hammering into place, carving and/or attaching insulation materials by wire or adhesive.

(3) 30% of time is spent on the finishing operation in which insulating materials are coated with cement, resin, cloth, or petroleum-based sealers.

(4) 10% of the time is spent in tearing out old insulation prior to re-application.

(5) 5% of the time is spent in blending varying combinations of cements in buckets, troughs or in automatic mixing machines.

(6) General work, occupying 5% of the time, comprises cleaning up of old insulation, transporting material and moving equipment.

d. In an attempt to improve the insulation program of the Navy, NAVSECPHILADIV, by reference (a), was directed to participate in a survey of the shipyards and the insulation manufacturers so that action can be taken to minimize the health hazards to which insulation workers are exposed. Fulfilling the schedule proposed by reference (b), this activity has completed the suggested study of the practices of shipyards and shipyard insulation workers. Findings of this study are presented herein.

2. Shipyard Survey

a. Letter inquiries addressed to the Naval Shipyards resulted in 100% response, whereas those addressed to private shipyards failed to elicit replies from Newport News Shipbuilding and Drydock Co., and Ingalls Shipbuilding Corp. However, General Dynamics, Lockheed Shipbuilding and Bath Iron Works responded to our inquiry. Follow-up personal visits were made to representative Naval and private shipyards on the East and West Coasts and reports of visits to their installations have been submitted to NAVSEC by references (c) through (f). Discussion meetings were held with medical directors, industrial hygienists, safety managers, value analysis engineers and pipe-coverer shop foremen. In every instance, it was noted that shipyard personnel management is aware of the hazards attending the use of asbestos insulating materials but does not exercise an equal degree of care in their elimination. Worker organizations have been instrumental in securing some improvements but their chief interest is in securing "dirty" or "hazard" money for handling these materials. Shipyard safety bulletins to guide the practices of shop workers have been issued at every Navy installation, although not all of the workers abide by them. However, the workers do submit to semi-annual chest x-rays. The interpretation of the x-ray plates should not be considered lightly since variations in the technique of taking the film may result in disclosing a greater incidence of asbestosis than heretofore realized. BUMED should be consulted in this regard.

b. Conversations with industrial hygienists revealed that although the methods of conducting particulate determinations are important, there is no uniformity in the shipyards. It was also noted that the method recommended by the American Hygiene Association has not been updated since 1942. This procedure is generally used by the shipyards. The areas of sampling, the method of sampling and the operation and material involved affect the total dust count reported. It was also expressed that the techniques of sampling, as well as the method of counting the particles should be standardized for all shipyards. Total dust counts should be reported in addition to the fiber count and fiber size and, if possible identifying these fibers as asbestos. The wider use of a contrast phase microscope would enhance the identification of fibers and make the counting procedure more meaningful.

c. The fabricating shops were surveyed and their facilities were evaluated. Generally, exhaust equipment ranged from excellent to fair due mainly to varying ceiling heights. High ceilings favored the accumulation of overhead dust on rafters and beams. Those shops which had wooden floors required repeated vacuum cleaning and wet sweeping. Cutting and sewing tables equipped with a water supply and local exhaust hoods were ideal but, unfortunately, not all shops were so equipped. The sawing operation was not always conducted under adequate ventilation.

d. A study of insulating materials used by the shipyards revealed a wide range of materials including asbestos, rock wool, cork, elastomeric foam, fibrous glass, cellular glass, calcium silicate, magnesia, diatomaceous earth, cotton and cementous agents. The handling practices of these materials by the pipe coverer-insulator varied considerably and in many cases, the worker was his own chief enemy. He failed to wear coveralls, respirators, goggles, gloves and use protective skin creams and curtail smoking habits (a practice which is known to increase the incidence of asbestosis). Work practices were observed. One innovation initiated at one of the shipyards was the mixing of asbestos cement with water under cover of a closed polyethylene bag to eliminate dusting. All of the shipyards which use amosite asbestos blankets wet them down and enclose them in polyethylene bags prior to transportation to the application site and then rewet them with a fine water spray as they are being reopened for use.

e. Shipboard practices on the handling of asbestos-containing materials occasionally showed failure to isolate working areas, improper ventilation, dusting due to emptying cement bags, failure to wet down insulation preliminary to ripout and disposal in polyethylene bags, and failure to wear coveralls and properly equipped and approved respirators. Dust counting on board ship during dry ripout operation of amosite revealed a total dust count as high as 24 million parts per cubic foot (mppcf). The present accepted maximum limit for asbestos dust is 2 mppcf for an 8-hour working day.

f. In the observations made of the visited shipyards, reported on by references (c) through (f), it was indicated that in the fabrication shops, portable covers for flange joints and irregular surfaces are prepared from grade AA asbestos cloth (SS-C-446) and contain a fiber glass fill conforming to MIL-I-16411, type II. As a replacement for the asbestos cloth, one shipyard is satisfactorily using 100% fiber glass lagging, manufactured by J. P. Stevens, Co. (MIL-C-20079, type I). Aboard the visited ships at these installations, the following practices were observed, as previously reported:

(1) Ventilation ducts were insulated with unfaced fibrous glass board (MIL-I-742) and covered with rewettable asbestos cloth. Fibrous glass cloth (MIL-C-20079, type I) adhered with MIL-A-3316, class 1, has been used as a suitable replacement for the asbestos lagging cloth.

(2) Boiler steam drums, main steam flanges, deaerating feed tanks, water heaters and main propulsion turbines are insulated with asbestos felt (amosite) MIL-I-15091, type A, plain. To eliminate this material for this use, calcium silicate insulating blocks (MIL-I-2519, class 2) have been satisfactorily used for applications up to 1000 F. They are applied as two, 2-inch thicknesses covered by 1-inch open mesh wire and coated with magnesia cement (SS-C-160, type I) or mineral wool cement (SS-C-160, type III, grade f) and finally lagged with fiber glass cloth (MIL-C-20079, type I).

(3) For insulating hot piping up to 1200 F molded or preformed fibrous asbestos sections (MIL-I-2781, grade III, class f) have been replaced in some instances by calcium silicate (molded) sections (MIL-I-2781, grade III, class e).

(4) For stress relieving procedures on welded pipe joints and shafts, Johns-Manville, Cerafelt, refractory fiber felt (MIL-I-23123, grade B), is being used to replace amosite asbestos felt (MIL-I-15091, type A, plain). The temperature of the encased heating element in these applications ranges up to 2300 F.

(5) Where elastomeric foam is used as antisweat insulation on fire mains, and cold piping, a covering of 3 inch wide fibrous glass tape or cloth (MIL-C-20079, type I and III) may be used for sailor-proofing in place of asbestos cloth or painting, where abuse is a problem.

(6) Wherever asbestos cement (MIL-C-2908A, type I) has previously been utilized, replacement may be effected by the use of mineral wool cement (SS-C-160, type III, grade f).

(7) Asbestos millboard (HH-M-351), a highly dust producing material during sawing operations, may be eliminated in the manufacture of removable covers by replacing with fiber glass felt (MIL-I-16411, type II).

3. Industry Survey

a. Letters of inquiry addressed to some 20 manufacturers and vendors of thermal insulation were followed by personal visits from company technical representatives, including directors of research and development and company officials. The response included submission of letters, catalogs, samples, field demonstrations, and, in one instance, a letter from one manufacturer's representative cautioning the Navy against legislating the asbestos business out of existence. In the main, however, helpful letters describing new materials and new uses for old materials were received. Information reported by these letters indicated that some consideration is given to the workers' safety by conducting particulate counting, by furnishing exhaust ventilation, by wetting down the ingredients and by automating the production line from processing the raw material to packaging the finished product. Moreover, one large insulation manufacturer has contributed a substantial grant to the Insulation Industry Hygiene Research Program which is concerned with the hazards of asbestos and how to overcome them. However, no industrial plants were visited to observe their manufacturing procedures, safety precautions exercised, worker habits or packaging and other pertinent sequences of producing thermal insulating materials.

b. The National Insulation Manufacturing Association through its executive secretary has issued pamphlets describing recommended health safety practices for handling and applying thermal insulation products containing asbestos and mineral fibers. Additionally, application practices for spraying asbestos fibers have been issued by the executive secretary of the Sprayed Mineral Fiber Manufacturers' Association. Adequate ventilation, wetting, vacuum cleaning of dust and the wearing of Bureau of Mines-approved respirators are emphasized during ripout and application procedures. The associations advocate both isolating the working area in order to prevent excessive dust contamination in adjacent areas and permitting only workmen engaged in ripout operations to be allowed in the work location. In every case, unnecessary handling of scrap or permitting scrap to lie around unprotected should be prohibited. The recommendations advocated by industry generally have been adopted by the Naval and private shipyards.

c. Several responses from insulation manufacturers have indicated that new materials are being developed for the replacement of asbestos for thermal insulation. When these products become available, they should be subjected to Industrial Hygiene studies prior to adoption, especially if the new materials contain volatile solvents. In addition, these materials should be critically evaluated with respect to the following:

(1) Shipping, movement and storage properties (weight allowance).

(2) Ease of removal and reapplication whenever necessary.

(3) Dusting tendencies (especially if used in radioactive applications).

(4) Combustibility (flash point, fire point, smoke density, smoke toxicity, fuel contributed).

(5) Safety requirements (dead load wear, impact or mechanical damage, forces of expansion and contraction, vibration).

(6) Compatibility with metal to which it is applied (resistance to atmosphere, spillage).

(7) Thermal conductivity at use temperature.

d. As a result of our inquiries, industry has offered information on the following materials and their current prices for evaluation as alternates for minimizing the hazard attending the use of asbestos:

(1) Fiber glass felt, MIL-I-16411, type II with a service temperature up to 1200 F is supplied by Pittsburgh Corning, (Temp-Mat), Eastern Refractory Inc. (Erco-Mat 1300) and Owens-Corning (W-1200-6). The approximate cost is sixty-five cents a square foot for a one inch thickness.

(2) Calcium silicate pipe insulation, MIL-I-2781, grade I, class b; grade II, class d and grade III, class e, with a service temperature up to 1200 F is supplied by Pabco Industrial Products Division (Caltemp), Owens-Corning (Kaylo), Johns-Manville (Thermobestos), GAF Corp. (Calsilite) and Keene Industrial Insulation (Thermasil). The cost of 1½" NPS x 1" thick, grade I, class b is seventy-five cents a foot; grade II, class d is $1.20 a foot and grade III, class e is $1.10 a foot.

(3) Fiber glass cloth with a service temperature of 1000 F is supplied by J. P. Stevens Co. as style #1925 at $2.50 per square yard and style #84205 at $1.32 per square yard. These materials can be incorporated in MIL-C-20079, type I by raising the maximum weight requirements per square yard.

(4) Calcium silicate block insulation, MIL-I-2819, classes 1 and 2 with a service temperature up to 1000 F is supplied by Pabco Industrial Products Division (Caltemp), Johns-Manville (Thermobestos), Owens-Corning (Kaylo) and Keene Industrial Insulation (Thermasil). The cost of a 1" thickness is fifteen cents a square foot and of a 2" thickness is twenty-eight cents a square foot.

(5) Asbestos cloth, lint free, is supplied by Nicolet Industries Inc., manufactured with Nicolon and Nicofil yarns. Cost is not known.

(6) Asbestos felt, lint free, with a service temperature of 850 F is supplied by H. K. Porter Co., Inc. (Knitted Amosite).

(7) Foam plastic, elastomeric, pipe insulation, MIL-P-15280, forms T and S with a service temperature of 180 F is supplied by Johns-Manville (Aerotube), Keene Industrial Insulation (Mono-flex), Armstrong Cork (Arma-flex) and Owens-Corning (O-C Flexible Tubing and Sheeting). A 1 1/2" NPS x 3/4" thickness is thirty-seven cents a foot and eighty-seven cents a square foot for sheeting 3/4" thick.

(8) Refractory fiber, MIL-I-23128, grade B with a service temperature up to 2000 F is supplied by Johns-Manville (Cerafelt). Cost is not known.

(9) Fiber glass tape, MIL-C-20079, type II, class 3 is supplied by Reef Industries Inc., and Carolina Narrow Fabric Co. (Sea-Lag Form-I-Glass #100 Tape) at $1.35 a square yard.

(10) Asbestos cloth, a rewettable lagging cloth, is supplied by H. K. Porter Co., Inc. (RWL-100 Lagging Cloth) and Raybestos-Manhattan Inc. (R/M Speedlag Cloth) at $2.50 a square yard.

(11) Cement, finishing, mineral wool, SS-C-160, type III, class f with a service temperature of 1200 F is supplied by Eagle Picher Industries Inc. (One-Cote and Rylo Cement), Keene Industrial Insulation (Super Powerhouse), Forty-Eight Insulation Inc. (48 Quick Set Cement) and Pabco Industrial Products Division (Finishing Insulating One-Coat Cement). Approximate cost is $4.50/50 lb bag.

(12) Fibrous glass, pipe insulation, MIL-I-22344, with a service temperature of 370 F is supplied by Johns-Manville (Micro-Lok), Keene Industrial Insulation (Mono-Kover), Owens-Corning (Fiberglas Pipe Insulation) and Certain-Teed Products Corp. (Snap-On). A 1½" NPS x 1" thickness costs $1.17 a foot.

4. Conclusions

a. Naval and private shipyards as well as insulation suppliers are well aware of the serious hazards attending the use of asbestos. Nevertheless, considerable asbestos-containing insulation material currently is being used in Naval applications and stringent handling precautions are not being enforced in all instances.

b. In the course of performing surveys of shipyards and insulation suppliers, NAVSECPHILADIV uncovered ample information to lead this activity to believe that the use of high-asbestos-containing thermal insulating materials should be curtailed due to hazards to the health of insulation workers. However, inasmuch as the Medical phase for the overall asbestos study was assigned to BUMED by reference (a), BUMED should be consulted for more definitive solutions to the medical aspects of this problem.

c. The results of the NAVSECPHILADIV survey indicates that suitable alternate insulation materials presently are available with decreased health hazards attending their use.

5. Recommendations

Based on the finding of this survey and in order to minimize health hazards attending the use of Naval insulation, the following action is recommended:

a. NAVSEC/NAVSHIPS issue an interim instruction to all concerned activities to replace all current utilization of high-asbestos-containing materials with alternate materials in the following applications:

(1) Discontinue the use of amosite asbestos insulation felt (MIL-I-15091, type A, plain) for stress relieving and as a filler in the manufacture of removable covers. Substitute calcium silicate block insulation (MIL-I-2819, classes 1 and 2) or Cerafelt, a refractory insulation felt, conforming to MIL-I-23128, grade B for stress relieving applications. Substitute fiber glass felt (MIL-I-16411, type II) for amosite felt in the manufacture of removable covers.

(2) Discontinue the use of water repellant asbestos felt (MIL-I-15091, type B) as an antisweat insulation for cold and chilled water service, and substitute foam plastic (MIL-P-15280, forms T and S) in its place.

(3) Discontinue the use of preformed fibrous piping insulation (MIL-I-2781, grade II, class c and grade III, class f) and substitute calcium silicate (MIL-I-2781, grade I, class b, grade II, class d, or grade III, class e) depending upon temperature requirements.

(4) Discontinue the use of asbestos cloth (SS-C-466, form I, grades U. G., AA and AAA) for lagging purposes. A satisfactory substitute is fiber glass fabric such as #84205, presently available from the J. P. Stevens Co., Inc., and which can be incorporated into MIL-C-20079 by raising the weight requirements.

(5) Discontinue the use of asbestos cloth (SS-C-466, form I, grades U. G., AA and AAA) for the manufacturing removal covers. Fiber glass fabric such as #1925, manufactured by J. P. Stevens Co., Inc., is satisfactory for this use and can be incorporated in MIL-C-20079, with an appropriate weight adjustment. A limited use of grade AAA-M asbestos cloth as an inner surface of removable covers for rigidity of interference

cutouts may be permitted until glass cloth can be adapted for this purpose.

(6) Discontinue the use of thermal tape (MIL-I-15349) for hot piping up to 3/4 inch NPS and replace with fiber glass cloth, such as #1925 of J. P. Stevens Co., Inc., cover and a filler of fiber glass rovings (MIL-I-16411, type I).

(7) Discontinue the use of asbestos finishing cement (MIL-C-2908, types I and II) and replace with mineral wool finishing cement (SS-C-160, type III, grade f).

(8) Discontinue the use of asbestos millboard (HH-M-351) in the manufacture of removable covers by replacing with fiber glass felt (MIL-I-16411, type II).

b. Revise NAVSHIPS Technical Manual Chapter 9390, Thermal insulation and MIL-STD-769C, references (g) and (h) to reflect the following:

(1) Delete prohibited materials.

(2) Incorporate additional functions of presently available specification materials.

(3) Detail methods of handling and disposing of used insulating materials.

(4) Describe the stress relieving procedure for welded pipe joints and shafting depending upon the use of a resistance or induction coil and the insulating materials required in each instance.

(5) List a realistic tabulation encompassing the quantity of insulation and the degree of protection afforded by different thicknesses of the various insulating materials.

c. Promulgate and strictly enforce comprehensive safety regulations and required housekeeping practices in shops and ships with respect to all phases of handling insulation materials. In this regard, the wide

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adoption of a self contained battery operated respirator should be considered during ripout operations of asbestos insulation. A Stryker Cast Cutter will minimize dusting during this shipboard ripout procedure.

d. Critically evaluate new materials as they become available for the replacement of asbestos for thermal insulation.

J. W. Murdock
J. W. MURDOCK
By direction

Copy to:
NAVSEC 6101C(20)

NAVSECPHILADIV 6700, 6700BCH,
6712, 6720,
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