U.S. Department of Transportation

United States Coast Guard

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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 3-92
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Subj: Recommended Program for Protection of Merchant Mariners from Occupational Health Problems

1. PURPOSE. The purpose of this Circular is to provide the marine industry with guidance for a comprehensive health and safety program. The Coast Guard believes that companies which implement this voluntary program will significantly improve worker health and safety.

2. BACKGROUND.

   a. The Coast Guard contracted Southwest Research Institute, San Antonio, Texas (SWRI) to conduct a comprehensive study of the potential hazards to merchant mariners serving on board chemical vessels. After a thorough evaluation of these hazards, SWRI designed and implemented, on a trial basis, a Marine Occupational Safety and Health program. The program was successful and the results formed the basis for SWRI's recommendations to the Coast Guard.

   b. In August 1987 the Coast Guard tasked the Chemical Transportation Advisory Committee (CTAC) with developing a recommended course of action for Coast Guard implementation of occupational health standards for merchant mariners.

   c. The Chemical Transportation Advisory Committee formed the Marine Occupational Safety and Health Subcommittee (MOSH) to address this issue. In January 1991, after two years of development, MOSH submitted a recommended voluntary standard to CTAC which incorporated the major elements of SWRI's program. CTAC approved the recommendations and presented them to the Coast Guard.

3. DISCUSSION.

   a. This Circular provides technical information to establishing a complete and comprehensive health and safety program or merchant mariners. This voluntary program is intended to be applied to crewmembers on board all Coast Guard inspected vessels, as defined in 46 U.S.C. 3301 et seq., exposed to occupational health hazards. It could also be applied to mariners on uninspected vessels as long as these guidelines enhance and do not conflict with mandatory requirements related to the maritime industry issued by the Occupational Safety and Health Administration (OSHA).

   b. This program addresses hazards found on vessels, both cargo and non-cargo, such as confined space entry, engineroom asbestos, carbon monoxide, and noise.

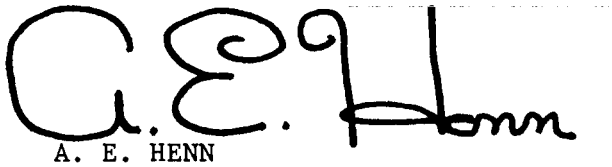
c. Several aspects of this program will require the services of a professional industrial hygienist to develop control strategies for specific hazards that the company's employees are exposed to. An industrial hygienist should be included in any company's occupational health and safety program as either an employee or consultant.

4. IMPLEMENTATION

a. The Coast Guard recommends that maritime companies which employ merchant mariners on board inspected vessels adopt the applicable sections of the enclosed Marine Industrial Hygiene Program for their occupational health and safety program.

b. The Coast Guard wholly endorses the use of a medical monitoring program for exposures to occupational health hazards when it is possible for an effective program to be established. Effectiveness will depend upon the types of chemicals workers are exposed to and other factors. The guidelines for a medical monitoring program should be established with input from an industrial hygienist and health professionals.

c. The enclosed program has several new concepts such as priority ranking of jobs and hazards. Although these concepts have not been adopted by federal or state agencies in. mandatory standards, this approach allows companies with limited resources to identify the jobs and exposures for which the greatest improvement of worker health can be achieved. Feedback from industry is encouraged during and after the implementation of this program.



A. E. HENN
Rear Admiral, U.S. Coast Guard
Chief, Office of Marine Safety,
Security and Environmental Protection

End: (1) Comprehensive Health and Safety Program for Merchant Mariners
(2) USCG Industrial Hygiene Workplace Monitoring Report CG-5386 (Rev. 4-85)

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DEFINITIONS

BIOLOGICAL HAZARDS: Biological agents or substances present in or arising from the work environment which present or may present a hazard to the health or well being of the worker or community. Biological agents or substances which could be biological hazards should include, but not be limited to, infectious or parasitic agents; non-infectious microorganisms such as some fungi, yeasts and algae; plants and plant products, and animals and animal products that cause occupational disease. (Example: spores in grain dust)

ERGONOMIC HAZARD: Any potential health hazard which arises from the interface between personnel and equipment/tools.

EXPOSURE AND HAZARD ASSESSMENT: A comprehensive review of workplace operations and the hazards associated with those operations to determine the relative importance, or significance, of those hazards including exposure potential where appropriate (hazardous chemical agents in particular).

This assessment may include actual exposure monitoring data. During initial assessment, exposure data is expected to be limited.

Exposure and hazard assessment also differs from exposure monitoring in that assessment should take into consideration the likelihood that agents will harm personnel in the actual circumstances of work. It is a function of such factors as frequency and quantity encountered, chemical properties, toxicity, weather conditions and others.

This comprehensive review should be conducted using a team approach which should include affected support and operational personnel (operations managers, safety staff, and health care staff are examples) in addition to personnel such as staff or consulting industrial hygienists.

EXPOSURE LIMITS: Any appropriate, recognized exposure limit intended for protection of personnel from occupational disease or injury. The two most common types of exposure limits are 8 hour Time Weighted Average (TWA) limits intended for prolonged exposures, and Short Term Exposure Limits (STELs) usually intended for periods of 15 minutes or less. The most common sources of exposure limits are:

OSHA's Permissible Exposure Limits (PELs/TWAs) 29 CFR 1910.1000,

American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs).

(Note: where OSHA or ACGIH values do not exist, NIOSH or other exposure standards may be used).

EXPOSURE MONITORING: A data collection and analysis effort, typically using standardized methods, designed to characterize personnel exposures during certain combinations of job tasks and associated hazards. It is important that trained personnel (such as industrial hygienists) be employed to develop methods and interpret results.

HAZARD: The potential of a substance or agent for causing harm to people's health.

INCIDENTAL EXPOSURE REPORT: A report intended to capture information about an accident involving chemicals which might not otherwise be reported as a lost time injury, Coast Guard casualty report, product loss report, etc.

RANKING: A method to prioritize job tasks and associated hazards developed through health risk assessment. The assessment uses the best available exposure monitoring information. Risk ranking may result in a unique ranking for each individual combination of job task and hazard. For operations which involve many potential combinations of hazards and job tasks it may be necessary to group or classify the hazards to determine priorities.

I. HEALTH RISK ASSESSMENT

I.A. Initial assessment of hazards and exposure potential. Each vessel owner/operator should conduct initial workplace hazard and exposure assessment of all existing vessels or any newly acquired vessels using the information listed below, but not necessarily in the order given.

I.A.l. Identify health hazards

a. Hazardous chemical agents. Inventory or develop a list of hazardous chemicals used or handled. This list should prioritize chemicals by relative hazard and frequency of encounter. Examples are as follows:

(1) hazardous chemical cargoes

(2) hazardous chemicals not carried as cargo such as:

- asbestos
- paints and solvents
- hydrogen sulfide (i.e., H_2S in sewage tanks)
- boiler water treatment chemicals
- battery acids

b. Other commonly recognized hazardous agents or conditions. Inventory or develop a list of other hazardous agents (other than chemicals) such as:

- confined spaces (including all cargo tanks)
- noise
- temperature stresses (heat and cold stress)
- ergonomic stresses
- biological hazards
- radioactive hazards

c. Other hazards. Review existing records. Consider existing or historical indications of health hazards or hazardous work practices from sources such as:

- previous exposure monitoring data
- personnel records and job descriptions and locator data which could be used to determine association with hazardous job tasks
- cargo handling records ships stores and equipment records
- training records
- equipment records for personal protective equipment and environmental monitoring equipment
- incident reports

I.A.2. Identify job tasks associated with hazards. Identify hazardous workplace locations and job tasks with exposure potential based on ranking of health hazards, through interviews with vessel management and crew members, and direct observation of work practices.

I.A.3. Identify routes of potential exposure. Determine exposure routes of concern for hazardous chemical agents identified and listed above.

- inhalation hazards
- dermal hazards
- ingestion hazards
- others

I.A.4. Review work practices

a. Review existing work practices associated with job tasks, such as those listed below, and evaluate their adequacy.

- confined space and pumproom entry procedures
- internal cargo tank cleaning operations (as a special subcategory of confined space operations)
- cargo hose connect/disconnections
- tank inerting
- cargo transfer and tank gauging
- inspection and maintenance of personal protective equipment
- emergency procedures, e.g., confined space rescue and environmental spills or releases others

b. Are there written guidelines for these operations? Are all important hazards addressed? Do practices in the field follow the written guidelines, and provide intended/needed protection?

I.A.5. Review protective equipment in use. Note protective equipment used (including materials of construction).

a. head, face, and eye protection

b. hearing protection *

c. foot protection

d. aprons, pants, jackets, encapsulating suits

e. gloves

f. respiratory protection *

g. splash protective equipment, i.e., disposable versions of the above used for accidental, sporadic protection.

*(NOTE: The use of this equipment does not mean that exposures should not be further evaluated. Exposure monitoring should determine exposure potential without anticipating protection from personal protective equipment, and should also be used to determine the adequacy of the equipment in use.)

I.A.6. Rank hazards. Rank potential hazards in accordance with the exposure and hazard assessment results to determine those requiring control, monitoring, and/or further assessment.

a. Significant health hazards.

(1) hazardous chemical agents

(2) hazardous physical agents

b. Job tasks which pose potential health hazards.

(1) confined space and pumproom entry procedures

(2) internal cargo tank cleaning operations (as a special subcategory of confined space operations)

(3) inerting tanks

(4) cargo hose connect/disconnections

(5) cargo transfer and tank gauging/sampling

(6) emergency operations such as:

- confined space rescue,
- equipment failure,
- accidental releases (spills/venting), and
- first aid for overexposures.

(7) other job tasks which pose a significant health risk.

I.B. New Hazards. Update list/inventories when new health hazards are introduced or identified, e.g., new cargoes or new chemicals.

II. EXPOSURE MONITORING. Each vessel owner/operator needs to develop a monitoring program and conduct preliminary exposure monitoring of workers whose exposures may approach exposure limits based on the hazard ranking developed in Section I. It is not the intent to monitor all job tasks and hazards. Exposure monitoring should focus on job tasks and hazards with potential to approach exposure limits.

II.A. General.

I.A.l. Purpose.

a. Exposure monitoring is a data collection and analysis effort designed to quantitatively characterize personnel exposures during certain combinations of job tasks and associated hazards. Typically, but not always, established sampling and analytical methods are used. Because of the technical nature of this step, it is important that trained personnel (such as industrial hygienists) be employed to develop methods and interpret results.

b. Exposure monitoring results should be used to determine the adequacy of existing control measures (engineering control measures, safe work practices, and personal protective equipment). Exposure monitoring results should also be used to assess exposure potential.

II.A.2. Personal protective equipment considerations. Exposure monitoring should not adjust measured values in order to account for anticipated protection from personal protective equipment. Exposures samples are therefore collected in a manner which determines personnel exposures as if they were not wearing personal protective equipment. (For example vapor exposure samples should be collected outside of respirator masks rather than inside them.)

II.B. Preliminary exposure monitoring.

II.B.l. Determine job tasks and hazards to be evaluated. Preliminary exposure monitoring should be conducted for job tasks and hazards with a potential of exposure which may approach exposure limits based on hazard ranking from Section I.

II.B.2. Considerations. Preliminary exposure monitoring should be done with the best industry accepted method available. This is not limited to OSHA and NIOSH sampling methods. Preliminary exposure monitoring should consider a variety of factors to estimate worst case conditions and exposure potential for hazard prioritization. For example, TWA sampling priorities might give highest priority to frequently encountered cargoes (i.e., benzene) and vessel locations where area concentrations were found to be above exposure limits. A lower priority might be assigned where a product's vapor pressure is low relative to exposure limits (i.e., kerosene), and where spot checks of area concentrations using direct reading devices confirm levels that do not approach exposure limits.

II.C. Periodic exposure monitoring

II.C.l. Determine job tasks and hazards to be monitored. If hazard ranking and preliminary exposure monitoring indicate that exposures approach exposure limits then it will be necessary to establish a periodic exposure monitoring program.

II.C.2. Considerations. Periodic exposure monitoring should be performed in accordance with sampling and analytical methods established by NIOSH, OSHA, and others to ensure highest validity of results. The frequency of periodic monitoring should be determined based on health hazard ranking and preliminary monitoring results and existing legislation.

III. EXPOSURE CONTROL

III.A. Written programs. Each vessel owner/operator should develop a written occupational health program which documents an exposure control strategy, based on the initial exposure and hazard assessment and exposure monitoring results. It should include provisions for the communications of hazards, as discussed below. In addition, it should include appropriate elements from Section B below.

(NOTE: Coast Guard Navigation and Vessel Inspection Circular (NVIC) 12-82 contains recommended controls for excessive noise on board vessels. NVIC 6-87 contains recommended controls for asbestos on board vessels.)

III.A.1. Communication of hazards

a. Access to hazard information. Each vessel owner/operator needs to establish administrative control procedures to ensure that accurate information about the hazards and locations of cargo and non-cargo hazards is readily available. Safe work practices should include a review of this information before conducting potentially hazardous activities.

(1) Cargo information. For cargoes this information includes, but is not limited to, a 24 hour emergency contact such as CHEMTREC (if appropriate), and the following:

- the proper shipping name
- the cargo's appearance and color
- hazards in handling the cargo
- special handling procedures (such as routine monitoring, atmospheric controls, and regulatory/operational requirements)
- procedures in the event of spills or leaks
- first aid procedures for exposed personnel
- fire fighting procedures and extinguishing agents (for flammable or combustible cargoes)
- the shipper's name
- loading point
- approximate quantity of cargo
- the cargo location (specific tank or hold)

(2) Receipt of cargo information. The master or vessel operator needs to ensure that a cargo is not received for shipment until the shipper has provided a 24 hour emergency point of contact, and the information below. This information should be provided no later than the pre-transfer conference. The information to be provided by the shipper includes, at a minimum, the following:

- the proper shipping name
- the cargo's appearance and color
- hazards in handling the cargo
- special handling procedures (such as recommended personal protective equipment)
- procedures in the event of spills or leaks
- first aid procedures for exposed personnel

- fire fighting procedures and extinguishing agents (for flammable or combustible cargoes)
- the shipper's name

(3) Sources of cargo information. With the exception of the proper shipping name, the source(s) of hazard information is not specified and may be obtained from cargo information cards, manufacturers' Material Safety Data Sheets (MSDS), NFPA-49 Hazardous Chemical Data, or any other reliable source. Where conflicting information exists among these sources, the manufacturer's MSDS information should be given the greater weight.

b. Workplace labeling. Where appropriate, locations with cargo and non-cargo hazards should be labeled to support effective implementation of safe work practices, e.g., noise hazard locations should be labeled to advise crewmembers to use hearing protection.

III.B. Exposure control strategy. The exposure control strategy should document how the appropriate control(s) listed below will be used to control priority hazards. The strategy should be regularly reviewed and, as necessary, updated to reflect changes in operating conditions.

III.B.l. Engineering controls. Appropriate engineering controls are the preferred methods for controlling exposure hazards. Engineering controls may include, but are not limited to:

- vapor control or recovery systems
- closed loading and gauging systems
- controlled venting systems
- noise controls

III.B.2. Safe work practices. Safe work practices are a vital part of a successful exposure control program, and should be included in all control strategies.

a. Development of safe work practices. Safe work practices should be documented as part of the vessel's written operating procedures or as a separate manual. Safe work practices should be developed, and as necessary, be updated, based on the exposure and hazard assessment, and exposure monitoring findings. Each safe work practice should specify the following:

(1) the job task for which it applies,

(2) the hazards for which it applies, and

(3) the standard procedures which are to be followed

b. Specific safe work practices. Each vessel owner/operator needs to establish a written set of safe work practices, when applicable, for specific activities listed below.

(1) Confined space entry. Safe work practices need to be established for a work authorization permit procedure for confined space entry, including internal cargo tank cleaning operations (as a special subcategory of

confined space operations). The written procedure may simply state that crew members are not to enter confined spaces. If confined space entry is conducted by any personnel, permits should follow the guidelines below:

(a) Permits should be issued by specified individuals for a specific period of time. A Marine Chemist Certificate issued by a NFPA Certified Marine Chemist or personnel with similar credentials would be acceptable.

(b) Personnel issuing permits should ensure that they are canceled when work is completed or the authorized period of time has lapsed.

(c) Permits should be issued only after spaces have been tested for applicable hazardous atmospheres (oxygen deficiency/enrichment, combustible vapors or gases, and toxic atmospheres).

(d) Permits should specify the personnel and work which is authorized, as well as the space(s) for which the permit applies (applicable personnel may be specified in general, and need not be specified individually or by name).

(e) Permits should specify protective equipment and procedures to be used (such as forced ventilation, tank hatch standby, fire watch, chemical protective clothing, retrieval harnesses, or explosion proof flashlights).

(f) Permits should specify follow-up testing which is needed to maintain the permit in force (such as oxygen, combustible gas, or toxic testing), and the limits which would invalidate the permit.

(2) Welding and other hot work. Safe work practices need to be established for a work authorization permit procedure for welding and hot work. These procedures should follow the same guidelines as those for confined space entry above. It should be noted that a Marine Chemist Certificate is required by 46 Code of Federal Regulations prior to hot work on board CG certificated vessels. (This may be a written procedure that does not allow vessel crew members to conduct welding or hot work.)

(3) Pumproom entry. Safe work practices need to be established for pumproom entry.

(4) Cargo hose connect/disconnections. Safe work practices need to be established for cargo hose connect/disconnection operations for all vessels carrying cargo regulated under 46 CFR Subchapters O & D.

(5) Tank inerting. Safe work practices need to be established for inerting cargo tanks.

(6) Use of protective equipment. If personal protective equipment is used, safe work practices need to be established for all procedures involving the use of the equipment.

(7) Maintenance of protective equipment. If personal protective equipment is used, safe work practices need to be established for inspection and maintenance of the equipment.

(8) Uncontrolled hazards. Safe work practices need to be established for all procedures involving identified hazardous operation where engineering controls are not able to effectively reduce the hazard.

(9) Emergency procedures. Safe work practices need to be established for emergency situations such as fires, product spill, etc.

c. Product substitution. Product substitution is one of the best control strategies but often most difficult to adopt. For example replace hydrazine with safer boiler chemicals.

III.B.3. Personal protective equipment.

a. Administration of personal protective equipment programs. Each vessel owner/operator that prescribes personal protective equipment as a control option needs to develop appropriate procedures for administration of this control option. These procedures need to be part of the written occupational health program, and should include the elements listed below.

(1) Personnel charged with selection of equipment should be specified in the written program by name or specific job title or position.

(2) Personnel charged with selection of equipment should receive special training in the selection of appropriate equipment.

(3) Personal protective equipment should be selected based on the specific hazards to which personnel are exposed.

(4) Personnel required to use personal protective equipment should be trained in the proper use and limitations of the equipment.

(5) Procedures should be prescribed for decontamination, cleaning, and disinfecting of personal protective equipment.

(6) Procedures should be prescribed for periodic inspection and maintenance of personal protective equipment. Personnel responsible for inspection and maintenance should be specifically identified.

(7) Facilities should be provided, and used, for proper storage of personal protective equipment.

b. Respiratory protection programs

(1) 29 CFR 1910.134 respiratory protection

(a) If respiratory protection' equipment is prescribed as a control option the vessel owner/operator needs to ensure compliance with 29 CFR 1910.134.

(b) Personnel required to use negative pressure devices should be fit tested using applicable qualitative or quantitative fit testing techniques prescribed under 29 CFR 1910.134 or 29 CFR Subpart Z.

(c) Personnel required to use respirators with a facepiece sealing surface should be clean shaven to ensure adequate face/mask seal.

(2) ANSI Z88 guidelines. In addition to the provisions of 29 CFR 1910, the below ANSI standards provide additional guidelines which may be useful.

- ANSI Z88.2 (selection and use of respiratory protection)

- ANSI Z88.6 (physical requirements for use of respirators)

c. Dermal protection guidelines. The following guidelines serve as a basis for prescribing personal protective equipment for dermal exposures.

(1) Dermal exposure protection should be prescribed based on:

(a) the potential for exposure to cause skin injury or disease,

(b) the potential for the skin to absorb toxic materials which may, or may not, have direct effects on the skin itself, and

(c) the potential for skin exposure such as;

(i) Routine skin exposure to chemicals possessing dermal hazards requires the highest degree of protection.

(ii) For infrequent and/or accidental skin exposures, disposable, splash-type protection may be appropriate.

(2) Protective garments should be appropriate in design, construction, and materials for the particular chemicals being handled. Sources of information include manufacturer's recommendations (including Material Safety Data Sheets), and consensus standards such as the ACGIH TLV dermal exposure notations and the ACGIH "Guidelines for the Selection of Chemical Protective Clothing" (current version, 1985).

b. Face and eye protection. If appropriate, face and eye protection must meet the requirements of ANSI Z87.1 (Eye and Face Protection).

c. Emergency equipment. Equipment should be on hand for important, anticipated emergencies such as: confined space rescue, accidental releases (spills and venting), treatment of chemical splash (emergency eye wash stations, showers, and thermal/chemical burns for example), and first aid for acute overexposures to chemical vapors. Emergency equipment should be dedicated to emergency use to help ensure that it will be found in prescribed locations and quantities.

III.B.4. Workplace monitoring equipment. Each vessel owner/operator should, if appropriate, provide workplace hazard monitoring devices and personal monitoring devices to support confined space entry procedures, other safe work practices, and emergency procedures. These instruments include items such as:

Oxygen level meters (for vessels where confined space entry may be conducted).

Combustible gas meters (for vessels carrying cargoes regulated under 46 CFR Subchapters 0 & D).

Toxic gas meters, or detection tubes. Examples include: detector tubes for toxic evaluation prior to tank entry, hydrogen sulfide meters to monitor locations on sour crude carriers carbon monoxide meters to monitor for inerting gas leakage, and carbon monoxide meters for monitoring below deck operations involving internal combustion engines.

IV. TRAINING

IV.A. General requirements

IV.A.l. Written training program. Each vessel owner/operator needs to establish training procedures as part of the written occupational health program. Training packages should be general, and should be developed to allow the program director to educate field personnel during training sessions which may be brief, but periodic, and which may cover one or more topics as time permits. Requirements for periodic refresher training (such as confined space entry) should be identified.

IV.A.2. Program design. The degree of training should be appropriate for an individual's job tasks. At the lowest level, hazard information training and the hazards overview (described in IV.B.1 & IV.B.2) should be provided widely. Training in safe work practices and proper use of protective equipment (IV.B.3, IV.B.4, & IV.B.5) should be provided as needed for individuals who use such equipment or perform job tasks with prescribed safe work practices. Finally, a very specific set of individuals with critical responsibilities, e.g., tank testing to authorize entry, selection of monitors/alarms, selection of protective clothing, maintenance of equipment, or emergency response, should receive much more extensive training (IV.B.6). This training should go beyond basic procedures and equipment use and thoroughly address applicable corporate policies and procedures.

IV.B. Program elements. A training program should include, but is not limited to, the following elements:

IV.B.1. Hazard information resources. Each vessel owner/operator needs to ensure that all vessel personnel receive adequate training in hazard information resources.

a. Objectives. The objectives of this training include:

(1) increased personnel awareness of occupational health hazards,

(2) familiarizing personnel with available information resources and where to find them,

(3) familiarizing personnel with types of information provided in the various resources,

(4) training personnel in the proper use of the information resources available to them, and

(5) familiarizing personnel with exposure monitoring methods.

b. Resources to be addressed. This training should address hazard information resources, including, but not limited to, the items listed below.

(1) Material safety data sheets (MSDS). MSDSs should be explained even if these sheets will not be the primary hazard information resource (defined under 29 CFR 1910.1200). The explanation of these sheets should be made in a simple and understandable manner.

(2) "Emergency Response Guidebook" (DOT P 5800.4). The Department of Transportation's "Emergency Response Guidebook" (DOT P 5800.4) should be explained.

(3) Work authorization permits. Work authorization permits for confined space entry, hot work, and other particularly hazardous operations should be explained.

(4) Other resources. Other information resources which may be provided (such as cargo information cards, Coast Guard CHRIS sheets or Chemical Data Guide pages) should be explained.

IV.B.2. Hazards overview. Each vessel owner/operator needs to ensure that all vessel personnel receive hazard overview training. The hazards addressed should include both chemical and physical agents, as well as cargo and non-cargo hazards. This overview training whenever applicable, should include, but is not limited to, the following sessions:

a. Corporate safety and occupational health policy

b. Noise hazard overview. This training should address possible sources of noise in the work place (engine noise for example); applicable noise exposure standards which are being used; and prescribed hearing protection measures and equipment.

c. Routes of exposure. This training should address inhalation exposure hazards, absorption by skin and mucus membranes, and absorption by ingestion.

d. Toxic effects overview. This training should address acute toxic effects, chronic toxic effects, such as genetic & carcinogenic effects.

e. Hazardous operations overview.

(1) Description of training. This overview training should:

(a) describe hazardous locations and job tasks performed on vessels to which personnel may be assigned,

(b) describe how to avoid accidental or casual exposure to hazards such as paint sprays or cargo handling operations, and

(c) give specific examples and exposure potentials.

(2) Specific locations and operations. The following hazardous locations and operations should be included whenever applicable:

(a) hose connect and disconnections,

(b) tank cleaning and gas freeing,

(c) cargo sampling,

(d) venting and leakage,

(e) pump seals,

(f) valve packing,

(g) equipment failure,

(h) equipment repairs, and

(i) spills

f. Radiation hazards overview.

(1) Ionizing radiation hazards (i.e., radiography of welds)

(2) Non-ionizing radiation hazards (e.g., UV light from welding or the sun)

g. Heat and cold stress overview. This training should include recognition of warning signs, and procedures to be taken when warning signs are observed.

h. Confined space hazards overview. This training should include oxygen deficiency and enrichment hazards, fire and explosion hazards, and toxic vapor and gas hazards.

i. Emergency procedures overview.

IV.B.3. Safe work practices

a. Personnel to be trained. Each vessel owner/operator needs to provide training in safe work practices to all personnel conducting hazardous job tasks or working in hazardous locations.

b. Specific training items. This training needs to address all of the safe work practices developed in III.B, including the following where appropriate:

(1) safe work practices for confined spaces including work authorization permit procedures,

(2) safe work practices for internal tank cleaning operations (as a special subcategory of confined space operations),

(3) safe work practices for welding and hot work including work authorization permit procedures,

(4) safe work practices for pumproom entry,

(5) safe work practices for cargo hose connections/disconnections,

(6) safe work practices for tank inerting,

(7) safe work practices for use of personal protective equipment,

(8) safe work practices for maintenance of personal protective equipment,

(9) safe work practices for job tasks involving hazardous operations where engineering controls are not able to effectively reduce the hazard,

(10) safe work practices for emergencies. (i.e., cargo spill, marine fires, etc.), and

(11) safe work practices for cargo transfers and tank gauging/sampling

IV.B.4. Personal protective clothing/equipment

a. Content of training. Each vessel owner/operator needs to provide adequate training for personnel required to use personal protective clothing/ equipment. Training should be consistent with existing programs and policies, and should include the following:

b. Specified equipment

(1) their role in clothing/equipment selection,

(2) how to properly use the clothing/equipment, and
(3) their role in maintenance/decontamination.

b. Specified equipment. Each vessel owner/operator prescribing personal protective equipment listed below needs to provide appropriate training.

(1) hearing protection

(2) dermal protection

- gloves
- head protection
- protective footwear
- chemical protective clothing

(3) eye protection

- face shields
- goggles

(4) respiratory protection

- types of respirators required for different exposure levels and contaminants

(5) other protective equipment related to occupational health protection

(6) emergency equipment

IV.B.5. Workplace hazard monitoring devices

a. Content of training. Where safe work practices prescribe their use, each vessel owner/operator needs to provide adequate training for personnel required to use workplace hazard monitoring devices. Training should be consistent with existing programs and policies, and needs to be consistent with existing instruments and the applicable manufacturer's recommendation.

b. Specified equipment. Where appropriate each vessel owner/operator prescribing the workplace hazard monitoring devices or personal monitoring devices listed below needs to provide training in their proper use.

(1) oxygen meters

(2) combustible gas meters

(3) toxic gas/vapor meters

(4) toxic gas/vapor tubes (colorimetric tubes)

(5) fugitive emission detectors (organic vapor detectors)

(6) any other prescribed monitoring devices

IV.B.6. Specialized training for selected individuals. Certain individuals will need detailed training beyond safe work practices and procedures. Where appropriate this training should include the following minimum training.

a. Special confined space training. Personnel charged with authorizing confined space entry, or personnel charged with pre-entry testing of confined spaces should be specially trained in confined space entry procedures, including detailed training in testing equipment such as:

- proper selection
- proper use
- proper maintenance
- proper calibration

of all instruments needed for confined space entry testing including:

- combustible gas meters
- oxygen meters
- toxic testing devices

b. Special chemical protective clothing (CPC) training. Personnel charged with selecting CPC should receive special training in the proper selection of ensembles, materials, use, and maintenance of chemical protective clothing.

c. Special emergency training. Personnel charged with rescue responsibilities should receive special training in rescue policy and procedures, emergency first aid, CPR, confined space rescue and other emergency response procedures as appropriate.

V. RECORDKEEPING.

V.A. Record retention. Each vessel owner/operator needs to establish a record retention policy as mandated and in accordance with company policy.

V.B. Survey reports. Initial exposure and hazard assessment, follow-up surveys, exposure monitoring, and audit reports should follow the guidelines below.

V.B.l. Recommended content. Each vessel owner/operator needs to ensure that these reports include adequate information for documentation and later evaluation. The following information is recommended as a minimum:

a. Descriptive narrative:

(1) observation of job tasks,

(2) effect of work practices on exposure measurements, and

(3) sampling activities conducted.

b. Sampling results:

(1) Coast Guard Form 5386 may be used (optional).

c. Data to be entered into individual medical records:

(1) identification of personnel for which the data applies,

(2) identification of chemical substance (or hazard), and

(3) exposure measurement.

d. Results and recommendations:

(1) deficiencies and recommended remedial action,

(2) recommended program modifications, and

(3) recommended follow-up.

V.C. Incident reports

V.C.l. Reporting procedures. Each vessel owner/operator needs to establish procedures for internal reporting and investigation of incidents involving exposure hazards.

V.C.2. Specified incidents. Incidents of interest include, but is not necessarily limited to the following events if they result in a presumed overexposure:

a. non-routine job tasks,

b. unanticipated events, and

c. unscheduled events.

V.C.3. Content. Incident reports should include the following information:

a. a narrative description of the incident,

b. identification of the exposure hazard of interest,

c. personnel potentially overexposed,

d. witnesses, and

e. measured or estimated concentrations.

V.D. Employees potentially exposed to hazards. This record should contain:

- an accurate listing of all employees considered potentially exposed to hazards
- their job description
- any unique exposure hazards which require special attention

V.E. Training records. These records should include:

- dates
- topics
- attendees

V.F. Cargo information.

V.F.l. Accessible location. Each vessel owner/operator needs to ensure that the cargo information specified in III.A.l above is maintained in such a way that it is readily available to vessel crew members and any other personnel potentially exposed. In particular the information needs to be available for use by:

a. vessel personnel,

b. marine chemists,

c. shipyard personnel,

d. cargo surveyors,

e. facility personnel,

f. emergency response personnel, and

g. government personnel.

V.F.2. Last three cargoes available. Each vessel owner/operator should maintain the prescribed cargo information for the last three cargoes for use in toxicity determination prior to entry into cargo spaces.

V.G. Personal protective equipment and hazard monitoring device records. Each vessel owner/operator needs to establish adequate equipment records. These records should at least contain the following information where appropriate:

V.G.l. dates of issue,

V.G.2. maintenance records,

V.G.3. medical evaluation of fitness to wear respirators, and

V.G.4. instrument calibration records.

VI. PROGRAM AUDITS

VI.A. Written procedures and criteria. Each vessel owner/operator needs to establish procedures for program audits as part of their written occupational health program. The purpose of program audits is to monitor program effectiveness. Program audit procedures should meet the following criteria:

VI.A.1. Written policy. There should be a clearly stated written occupational health policy endorsed by management.

VI.A.2. Policy communication. The policy should be communicated to management and employees, and it should be understood and supported by management and employees.

VI .A. 3. Policy enforcement. The policy should be enforced and performance assessed periodically.

VI.B. Personnel to conduct audits. Each vessel owner/operator needs to specify personnel responsible for the management and administration of program audits as part of the written occupational health program. Management and administration of these audits should meet the following criteria:

VI.B.l. scheduling of periodic program audits,

VI.B.2. reviewing of programs and records, and

VI.B.3. providing written reports and recommendations.

VI.C. Audit criteria. Each vessel owner/operator needs to establish the following audit criteria in evaluation of its program, and confirm by field observations:

VI.C.l. Is there an established occupational health program?

VI.C.2. Are workplace hazard assessments conducted and up to date? How and when?

- exposure assessments?
- exposure monitoring?
- do they reflect operational changes?

VI.C.3. Are specific hazards identified?

- chemical hazards
- physical hazards
- other occupational health hazards

VI.C.4. How is hazard information communicated to employees?

VI.C.5. What type of training programs are conducted?

VI.C.6. What type of hazard controls are implemented? Are they effective?

VI.C.7. Are required records maintained?

- exposure assessment records
- exposure monitoring data training records
- medical surveillance records
- cargo information records
- personal protective equipment and workplace hazard monitoring device records

VI.C.8. Are employees familiar with safe work practices? Are the safe work practices followed?

VII. PERSONNEL AND LABORATORY SUPPORT

VII.A. Management and Administration. Each vessel owner/operator needs to specify in the written occupational health program, those personnel responsible for the management and administration of the program.

VII.A.l. Program Director. A program director in particular should be appointed, and should be a single responsible individual within the company.

VII.A.2. Program Assistant. Supporting staff should be included as necessary to assist the program director. In particular all:

- masters
- vessel operators

should be included as an integral part of the program management and administration staff.

VII.B. Support personnel. Each vessel owner/operator needs to specify in the written occupational health program, the support personnel that will be responsible for technical aspects of the program (such as exposure monitoring evaluation). It is not necessary that these personnel be members of the company, but consulting support is needed in at least the following specialties:

VII.B.l. safety,

VII.B.2. industrial hygiene, and

VII.B.3. occupational medicine.

VII.C. Audit and survey personnel. Each vessel owner/operator needs to specify in the written occupational health program, those personnel that will be part of the audit and follow-up survey teams.

VII.D. Lab support. Vessel owner/operators should designate qualified laboratories to provide laboratory support for workplace exposure monitoring.

APPENDIX A:PROGRAM DIRECTOR'S DUTIES

A. Each vessel owner/operator needs to describe the duties of the program director (see VI.A.l above) as part of the written occupational health program. These duties include responsibility for the items described below.

A. 1. Program management and administration

A.2. Data management and record keeping, including:

a. written safe work practices,

b. training packages,

c. potentially exposed employees,

d. equipment maintenance records

e. workplace hazard monitoring device maintenance records

f. workplace hazard monitoring device calibration records, and

g. records and reports.

A.3 Training

A.4. Program auditing

A.5. Information resources

APPENDIX B:INDUSTRIAL HYGIENIST'S DUTIES AND AUDIT SCHEDULE

B. Each vessel owner/operator needs to describe the duties of supporting staff (see VI.B above) as part of the written occupational health program. The duties of the industrial hygiene and safety staff should include responsibility for the items described below.

B.l. Exposure and hazard assessments and exposure monitoring

B.2. Development of safe work practices

B.3. Development of training packages

B.4. Investigation of incidents

B.5. Consultation as needed

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INDUSTRIAL HYGIENE WORKPLACE MONITORING REPORT

File(s) (check one or more):
☐ IHSD (Fill out blocks 1, 2, 3, 4) ☐ HMIN (Fill out block 5) ☐ HMIS (Fill out block 6)

FAC 1. Worksite Description | Facility Sampled:
WLOC Worksite (Bldg., Shop, etc.) _____
OPS Description of Work Operation _____
WOC Workplace Conditions _____
PRO Protective Equipment: _____
ENG Eng. Controls: _____

2. Hazardous Materials In Use
PNO Product # _____ Product Class _____
NM Product Name _____
CL

3. Sampling and Analysis Data
a. Sampling Data

		Atmospheric Conditions		
		DB Temp (° F)	R. H. (%)	Wind
SNO	Sample #			
ST	Sample Type (P, A or B)			
SLOC	Sample Location			
MED	Collection Medium (T;F;I)			
	Sample Data (mo-da-yr)			
	Sample Instrument			
	Calibration Date			
	Sample Rate (ℓ/min)			
TIME	Sample Time (min)			
	Sample Volume (ℓ)			

Analysis Requested	CAS #	NAME	CAS #	NAME
CAS, A	1	1	5	5
CAS, A	2	2	6	6
CAS, A	3	3	7	7
CAS, A	4	4	8	8

Sampled by _____ Title _____

b. Analysis Data:

Analytical Method (CAM) SCP # if NIOSH Method):		
R1, R5 R2, R6 R3, R7 R4, R8 Analytical Results (mg/M3) (f/cc) (%)	1. 2. 3. 4.	5. 6. 7. 8.

Date Sample Received	Date Results Reported	Lab Report #

Analyzed By _____ Laboratory _____

COM Comments: _____

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Reverse of CG-5386 (Rev. 4-85)

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4. Employee Exposure Sampling Data

_MP SSN RATE ESNO FREQ Name: Last, First, MI	SSN*		Job Title, Rate	Sample #	Est. Exp. Time (hr/wk)
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			

*Note: Insert an "x" after the SSN to indicate a personal sample.

5. Hazardous Materials Inventory

PNO NM CL FSN MFG MATLO Product No.	Product Name	Product Class	Fed. Stock No.	Manufacturer	Material Location

6. Hazardous Materials Information

Data Source (check one)
- ☐ CG-HMIS
- ☐ DOD-HMIS
- ☐ MFG.-MSDS (OSHA FORM 20)
- ☐ OTHER (Explain) _____

PNO SORCE NM — Product No.

Product Name

CL — Product Class

FSN — Fed. Stock No.

FED — FED Spec

ING AMT — Major Chem. Ingredients (%)

HAZ — Hazard

PRO — Protective Measures