



Standard Guide for Basic Elements of Shipboard Occupational Health and Safety Program¹

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1. Scope

1.1 This guide covers the basic elements of a Shipboard Occupational Health and Safety Program (SOHSP). These elements are applicable to all vessel types including but not limited to tank vessels, dry bulk carriers, passenger vessels, roll-on roll-off vessels, ore bulk oilers, offshore supply vessels, tugboats, towboats, and barges. The elements described are fundamental pieces of a systematic occupational safety and health program and may be used by company line managers, health and safety personnel or consultants who are implementing, improving, or auditing the effectiveness of a shipboard health and safety program.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ANSI Standards:²

[ANSI Z4.1-1986 Minimum Requirements for Sanitation in Places of Employment](#)

[ANSI Z41-1991 Personal Protection – Protective Footwear](#)
[ANSI Z87.1-1989 Practice for Occupational and Educational Eye and Face Protection](#)

[ANSI Z88.2-1992 Respiratory Protection](#)

[ANSI Z89.1-1986 Protective Headwear for Industrial Workers](#)

[ANSI Z244.1-1982 \(R1993\) Safety Requirements for the Lock Out/Tag Out of Energy Sources](#)

[ANSI/ASA S3.18-1979 \(R1993\) Guide for the Evaluation of Human Exposure to Whole Body Vibration](#)

[ANSI/ASA S3.44-1996 Determination of Occupational Noise Exposure and Estimation of Noise-Induced Hearing Impairment](#)

[ANSI/AWS Z49.1-1994 Safety in Welding, Cutting and Allied Processes](#)

2.2 Other Documents:

[NFPA 306-1997 Control of Gas Hazards on Vessels³](#)

[NFPA 1991-2000: Vapor Protective Suits for Hazardous Chemical Emergencies³](#)

[NFPA 1992-2000: Liquid Splash Protective Suits for Hazardous Chemical Emergencies³](#)

[IMO A.468\(XII\) Code on Noise Levels Onboard Ships⁴](#)

[IMO A.849 \(20\) Code for Investigation of Marine Casualties and Incidents⁴](#)

[IMO A.864 \(20\) Recommendations for Entering Enclosed Spaces Aboard Ships⁴](#)

[46 CFR 16.210 Pre-employment Testing Requirements⁵](#)

[U.S. Coast Guard Navigation and Vessel Inspection Circular 2–98 Physical Evaluation Guidelines for Merchant Mariner's Documents and Licenses⁵](#)

3. Significance and Use

3.1 This guide does not set specific performance or technical criteria, but recommends that companies set policies and objectives and develop procedures for managing their health and safety program. Companies should consider their unique organization, culture, and hazards on their vessels and the possible effects of their operations. The elements are intentionally flexible and may be tailored to address any size of operation or any vessel type. Note that although the standard is aimed at the shipboard occupational health and safety program,

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² Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

³ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

⁴ Available from International Maritime Organization (IMO), 4, Albert Embankment, London SE1 7SR, United Kingdom, <http://www.imo.org>.

⁵ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.

some of the elements address activities and commitments that must be completed or made by shore side personnel (for example, executive management commitment and provision of adequate resources). Key to the effectiveness of the program is the implementation of each element within an interconnected system.

4. Basic Elements

4.1 Executive Management Commitment and Leadership—Executive management commitment and leadership is a precondition for an effective SOHSP. Executive management commitment and leadership includes, but is not limited to integrating health and safety into the management structure and fabric of the company, developing a health and safety policy, developing health and safety objectives, providing resources to achieve the objectives, defining stewardship responsibilities and providing authority to carry out those responsibilities, and establishing accountability for safety and health as a part of job performance reviews. Further guidance is provided in **Annex A1**.

4.2 Employee Participation—Employees from all levels including crewmembers, officers, masters, persons in charge, and shoreside personnel should be directly involved with the SOHSP. Shipboard and shoreside employees should be involved in developing, implementing, evaluating, and modifying the SOHSP. Employees should also participate in setting health and safety objectives and performance criteria. This involvement might be through employee membership on safety committees that provide input to management for the development of safety and health policy, debate and set health and safety goals, measure and evaluate performance, and recommend modifications to the program based on their evaluation. Shoreside and shipboard employees should work together to achieve safety and health goals. For example, shoreside personnel should participate on vessel safety committees since their decisions affect vessel operations and ultimately the health and safety of vessel personnel. In large companies, individual vessel safety committees might submit recommendations to an overarching safety committee that evaluates the recommendations and sets policy to apply appropriate recommendations to the entire fleet. Further guidance is provided in **Annex A2**.

4.3 Hazard Anticipation, Identification, Evaluation and Control—The core function of any health and safety program is prevention. Health and safety hazards including fire, reactivity, and chemical and physical hazards, need to be anticipated and prevented from occurring. Hazards and unsafe operating procedures need to be identified and addressed so they will not endanger employees or the public and will not damage the vessel, cargo, or third party property. Potential hazards should be systematically anticipated, identified, evaluated, and controlled. Tools such as job hazard analysis, industrial hygiene exposure assessments, and risk assessment/management methodologies enable the evaluation and control of hazards. Further guidance is provided in **Annex A3**.

4.4 Training—Employees should receive training appropriate for their duties and responsibilities so that they may work

safely and not endanger their shipmates or the public. In addition, employees who have specific health and safety responsibilities (generally supervisors with responsibility for the safety of others, but also nonsupervisors who are assigned to safety committees or as crew member representatives) should receive training to enable them to carry out their health and safety program responsibilities. Further guidance is provided in **Annex A4**.

4.5 Record Keeping—Company records sufficient to demonstrate the effectiveness of the health and safety program should be maintained. Data that enables trend or pattern analysis for root causes is particularly desirable. For example, results of audits that evaluate effectiveness of the safety and health management system should be maintained. Records that indicate industrial hygiene exposure assessments have been conducted and appropriate controls have been implemented should be maintained. Current job safety analyses and corresponding standard operating procedures with safe work practices should be documented. Injury and illness data should be maintained to enable the identification of trends and patterns that associate the injury or illness with a common cause, which can be addressed. Training topics, lesson outlines, and attendees should be documented. Where appropriate, such records should permit evaluation of the program on individual vessels as well as across an entire fleet. Further guidance is provided in **Annex A5**.

4.6 Contract or Third Party Personnel—When contract or third party personnel are on board to perform work, vessel personnel should provide information regarding potential hazards on the vessel that may affect the contract or third party personnel. Potential hazards related to the work conducted by contract or third party personnel should be provided to the vessel owner/operator and/or the master/person in charge. Each employer should provide appropriate information regarding vessel and work hazards to their own employees. For example, exchange of information on chemical hazards might be accomplished by exchanging appropriate material safety data sheets (MSDS), then each employer can inform their own employees of the hazards identified in the MSDS. Further guidance is provided in **Annex A6**.

4.7 Fatality, Injury, Illness, and Incident Investigation—Personnel injuries, occupational illnesses, and “near miss” incidents should be promptly investigated. The current incident and other similar occurrences should be analyzed to identify the primary (root) cause and any contributing factors. The investigation report, setting forth primary cause, contributing factors, and corrective measures should be presented to management. Followup action that specifically addresses the report’s recommendations for corrective action should be undertaken and documented. Further guidance is provided in **Annex A7**.

4.8 Systematic Program Evaluation and Continuous Improvement—Maintaining an effective health and safety program is an ongoing process. The SOHSP should have systems for detecting, reporting, and correcting nonconformities to the program. Some type of “formalized” evaluation should also be conducted on a periodic basis consistent with other aspects of

the vessel's management plan. The evaluation should determine whether the SOHSP is appropriate for the vessel and its operations, that actual practices are consistent with the programs and procedures in the SOHSP, and that the SOHSP is effective. Comparison of data and records (refer to **Annex A5**, Record Keeping) to performance objectives and criteria (refer

to **Annex A1**, Section **A1.3**, health and safety objectives) can provide important indicators of the effectiveness of the SOHSP. Further guidance is provided in **Annex A8**.

5. Keywords

5.1 health; safety

ANNEXES

(Mandatory Information)

A1. MANAGEMENT COMMITMENT AND LEADERSHIP

A1.1 Health and safety programs are most effective when they are integrated into the management structure of a company, rather than treated as an “add on” program. Examples of integrated health and safety efforts include:

A1.1.1 Developing Standard Operating Procedures (SOPs), written to the education level of the person who must follow the SOP, that integrate safe work practices and basic operational functions,

A1.1.2 Making design review by qualified health and safety personnel an element of the acquisition procedures, and

A1.1.3 Making consultation with qualified health and safety personnel a part of the process when making changes to operations.

A1.2 Executive management sets the tone for the entire SOHSP through their policy regarding health and safety. Examples of values that can be stated and commitments that can be made in company policy include:

A1.2.1 A statement that the company will make every effort to provide a safe and healthy workplace and that working safely is a condition of employment,

A1.2.2 Statements that convey how important each crew member is to the vessel as a fellow worker and as a company resource:

A1.2.2.1 “The basic safety policy of this company is that no task is so important that an employee must violate a safety rule or put himself or herself at risk of injury or illness in order to get it done.”,

A1.2.3 A written commitment to provide resources necessary to implement the health and safety program could also be included in the policy statement, and

A1.2.4 Management can demonstrate commitment to the safety and health policies through word and action. For example, managers visiting vessels should follow safety rules and standard operating procedures, including use of hearing protection, safety glasses, safety shoes, protective clothing, and so forth.

A1.3 Setting and attaining health and safety objectives demonstrates a company's commitment to improvement of health and safety performance. Objectives provide a target

against which those who are responsible for health and safety may measure their progress. Quantifiable objectives are desirable since often, “What gets measured gets done.” (Refer to **Annex A8**, Systematic Program Evaluation, for examples of performance measures and an overall program audit.) Health and safety objectives may include:

A1.3.1 Eliminate lost time incidents,

A1.3.2 Report “near miss” incidents or problems, evaluate, and if appropriate, implement changes to prevent a more serious incident or accident in the future,

A1.3.3 Develop and implement a program of evaluations through drills and other means (for example, simulators) to ensure that personnel are competent to carry out their duties,

A1.3.4 Improve the health and safety program by reviewing, considering, and implementing appropriate published industry practices and consensus standards rather than relying on the imposition of new regulatory standards. Examples of consensus standards to consider include, but are not limited to: ANSI Z41-1991, ANSI Z87.1-1989, ANSI Z88.2-1992, ANSI Z89.1-1986, ANSI Z244.1-1982 (R1993), ANSI/ASA S3.18-1979 (R1993), ANSI/ASA S3.44-1996, ANSI/AWS Z49.1-1994, ANSI Z4.1-1986, NFPA 1991-2000, NFPA 1992-2000, NFPA 306-1997, IMO A.864 (20), and IMO A.468(XII).

A1.3.5 Complete periodic comprehensive (or area-specific) hazard review,

A1.3.6 Reduce exposure levels to airborne vapors to acceptable levels through appropriate controls,

A1.3.7 Complete annual respiratory fit testing on schedule,

A1.3.8 Develop and implement acute toxic exposure procedures addressing first aid procedures, obtaining additional emergency medical assistance, and appropriate medical surveillance tests (for example, S-phenylmercapturic acid in urine following a potential benzene overexposure), and

A1.3.9 Develop and implement an occupational health medical surveillance plan.

NOTE A1.1—The intent of this medical surveillance plan is to ensure employees are not overexposed to hazards on the job including chemicals, radiation, noise, and so forth. This section is not intended to address requirements of the Americans with Disabilities Act or issues covered by

physical standards related to watch keeping published elsewhere.

A1.4 Company management holds the authority to dedicate necessary resources to achieve health and safety objectives. Necessary resources may include:

A1.4.1 Access to health and safety information,

A1.4.2 Training, including classroom and on-the-job training, that cover topics identified by the company's risk assessment process as well as those required by international or national standards. These topics would include but not be limited to existing chemical and mechanical hazards,

A1.4.3 Qualified health and safety professionals, either on the company staff or hired as consultants,

A1.4.4 Capital investments in engineering controls, and

A1.4.5 Personal protective equipment.

A1.5 Defining stewardship responsibilities and providing authority to carry out those responsibilities is an essential component of management commitment. For example:

A1.5.1 *Company Management Should:*

A1.5.1.1 Designate a shoreside person who has access to the executive management of the company and is responsible to ensure essential health and safety issues are clearly communicated to executive management of the company and decisions regarding those issues are clearly communicated back to the vessel.

A1.5.1.2 Ensure adequate resources of time, funds for health and safety equipment, training and expertise are available to effectively implement the program throughout the company.

A1.5.1.3 Ensure that a safety committee or other mechanism to involve crewmembers in health and safety issues is created on each vessel adequately.

A1.5.1.4 Ensure that the elements of the shipboard health and safety program are integrated and systematically implemented throughout the company and on each vessel.

A1.5.1.5 Ensure that objectives are developed and performance measures are reported from each vessel.

A1.5.1.6 Ensure that all appropriate programs are developed and implemented including, but not limited to respiratory protection, hearing protection, confined space entry, and lock out-tag out.

A1.5.1.7 Set a good example for employees by following established safety rules on vessels and by staying current on training commensurate with duties.

A1.5.1.8 Report unsafe practices or conditions observed while on a vessel to the supervisor of the area.

A1.5.2 *Master/Person-In-Charge/Operator Should:*

A1.5.2.1 Ensure each crewmember receives an initial vessel orientation, covering company safety policy, emergency procedures, access and egress, fire fighting, job hazards, and information on hazardous materials before beginning work. Document the completion of this orientation.

A1.5.2.2 Ensure each crewmember is competent to perform a task or job by requiring a prejob explanation and/or walk through of all procedures including safe work practices before starting work on that project or equipment. Require prejob refresher training if the employee cannot demonstrate this competence.

A1.5.2.3 Ensure each crewmember has been issued and received training on the use of required personal protective equipment (PPE) before starting work on a project requiring PPE.

A1.5.2.4 Complete periodic walk-around health and safety checks of the vessel (accompanied by appropriate personnel including those who have responsibilities or work in certain areas, for example, chief engineer and an oiler in engine spaces and first mate and able-bodied seaman on deck).

A1.5.2.5 Periodically observe work performance of employees for compliance with safety rules contained or documented in the SOHSP.

A1.5.2.6 Set a good example for subordinates by following established safety rules and attending training as appropriate.

A1.5.2.7 Complete a preliminary investigation of all accidents and report findings to company management.

A1.5.2.8 Provide information to company management suggesting changes to company-wide standard operating procedures or equipment that will improve employee safety.

A1.5.3 *Officers/Other Management Personnel Should:*

A1.5.3.1 Act as the master's or person-in-charge's representative and implement examples listed for the master in areas over which they exercise supervision (for example, first mate responsible for "deck" personnel and Chief Engineer responsible for "engineers").

A1.6 Management should establish accountability for health and safety as part of job performance reviews. Performance reporting regarding health is as important and should be as routine within the company as reports regarding timeliness of delivery, cargo loss or contamination, or citations regarding violations of regulations.

A2. EMPLOYEE PARTICIPATION

A2.1 Full participation in developing, implementing, evaluating, and continually improving the SOHSP helps those on board the vessel see the SOHSP as something that is the result of a value they share with vessel owners/operators. Personnel directly involved with the work are often the best source of information on health or safety hazards and often can suggest effective methods for abating those hazards. Shoreside personnel need to be directly and heavily involved with the SOHSP because they are integral in setting the rules and schedules for vessel operation. Shoreside personnel also represent the vessel to management and are the link to the resources and authority necessary for the success of the SOHSP. Specific ways that crewmembers, officers, and shoreside personnel can contribute to the SOHSP include:

- A2.1.1 Participating in periodic vessel inspections,
- A2.1.2 Evaluating safety and health program materials,
- A2.1.3 Developing standard operating procedures that incorporate safe working practices,
- A2.1.4 Conducting job safety/hazard analyses (JSAs/JHAs),
- A2.1.5 Reviewing and analyzing injury and illness data,
- A2.1.6 Participating in risk assessment and risk management activities,
- A2.1.7 Participating in accident/incident/problem investigations,
- A2.1.8 Developing solutions to health and safety complaints and disputes,
- A2.1.9 Evaluating safety and health training activities, and
- A2.1.10 Evaluating the safety and health management system.
- A2.1.11 Line or operations personnel including crewmembers, officers, and shoreside personnel outside the health and safety staff may need training in health and safety techniques such as job safety/hazard analysis, reviewing injury and illness data for trends, risk assessment, and investigations. This initial training investment enables those who do the work

to meaningfully participate in identifying and solving health and safety problems. Those crewmembers, officers, and shoreside personnel who receive additional training in health and safety and actively participate in the development of the vessel or company SOHSP, or both, also become health and safety “champions” among their peers. Additional information on training is provided in [Annex A4](#).

A2.2 Since health and safety objectives and performance may directly affect crewmembers’ and officers’ current and/or future health and safety, they should be involved in setting those objectives and performance criteria. This participation may be accomplished through health and safety committee involvement, labor negotiations, or other mechanism suitable to the specific company. Refer to [Annex A1](#), Section [A1.3](#) for examples of health and safety objectives and performance criteria.

A2.3 Employees should:

- A2.3.1 Fully understand (including underlying principles) and follow established standard operating procedures and safety rules.
- A2.3.2 Report unsafe conditions or actions to supervisor as soon as they become aware of them.
- A2.3.3 Report all injuries to supervisor promptly.
- A2.3.4 Report all accidents, near misses, or problems to supervisor promptly.
- A2.3.5 Use personal protective equipment (PPE) in good working condition where it is required.
- A2.3.6 Do not remove or defeat any safety device or safeguard.
- A2.3.7 Encourage shipmates by words and behavior to follow standard operating procedures and use safe work practices on the job.
- A2.3.8 Make suggestions to supervisor or safety committee representative about changes to operating procedures, work practices, or equipment that will improve safety.

A3. HAZARD ANTICIPATION, IDENTIFICATION, EVALUATION AND CONTROL

A3.1 Potential hazards on the vessel and created by the vessel should be systematically anticipated, identified, evaluated, and controlled. Hazards that should be discovered, evaluated, and controlled by the SOHSP include hazards addressed by international conventions and national regulations and other hazards that are causing or likely to cause illness, death, or serious physical harm to workers or the public. Types of hazards to consider may include:

- A3.1.1 Hazardous atmospheres caused by oxygen deficiency, flammable or toxic gases or vapors, and biological agents,
- A3.1.2 Chemical hazards and the proper handling of vessel generated hazardous wastes,

A3.1.3 Physical hazards including noise, vibration, radiation, electricity, uncontrolled mechanical energy, and shifting cargoes that may engulf a crewmember,

A3.1.4 Ergonomic factors including fatigue, workstation design, and poor team practices,

A3.1.5 Collisions, groundings, or rammings and their resultant impacts, and

A3.1.6 Drowning.

A3.2 Methods of anticipation include:

A3.2.1 Systematic requirements for vessel and equipment design and modification review by qualified health and safety personnel,

A3.2.2 Periodic management review of the vessel and its operation, its equipment, and its fitness for purpose,

A3.2.3 A procurement system that automatically requires consideration of health and safety aspects of items ordered,

A3.2.4 Consideration of fitness for current conditions, and

A3.2.5 Systematic review of vessel and shoreside team practices.

A3.3 Methods of identifying hazards include:

A3.3.1 Vessel inspections,

A3.3.2 Industrial hygiene exposure assessments of chemical and biological hazards including inhalation and dermal exposure routes and physical hazards such as vibration and ergonomic hazards,

A3.3.3 Job safety analyses including risk assessment, both statistical and expert opinion based,

A3.3.4 Employee hazardous condition notification system including easy-to-understand labeling system for all possible mechanical and chemical hazards,

A3.3.5 Review of available safety and health data to identify trends,

A3.3.6 Readers interested in physical standards may refer to U.S. Coast Guard Navigation and Vessel Inspection Circular 2-98, Physical Evaluation Guidelines for Merchant Mariner's Documents and Licenses, and

A3.3.7 Readers interested in preemployment drug tests may refer to 46 CFR 16.210.

A3.4 Methods of hazard evaluation include:

A3.4.1 Comparison of industrial hygiene exposure levels to standards identified in the SOHSP (for example, standards required by regulation or prudent levels adopted by the company in the absence of regulatory requirements).

A3.4.2 Risk analysis tools, including:

A3.4.2.1 Hazard effects and control analysis,

A3.4.2.2 Hazard control analysis,

A3.4.2.3 Fault tree analysis of possibilities based on expert opinion,

A3.4.2.4 Management oversight and risk analysis, and

A3.4.2.5 Task hazard analysis.

A3.5 Methods of hazard control are hierarchical. In order of preference, they include:

A3.5.1 Inherent safe design and verification of design output to design requirements.

A3.5.2 Material substitution such as:

A3.5.2.1 Nonhazardous insulation for asbestos lagging,

A3.5.2.2 Citrus-based cleaning agents for solvent-based cleaning agents, and

A3.5.2.3 Nontoxic paint for toxic paint.

A3.5.3 Engineering controls such as:

A3.5.3.1 Closed gauging,

A3.5.3.2 Vapor recovery systems, and

A3.5.3.3 Climate-controlled spaces such as control booths in engine rooms.

A3.5.4 Administrative controls such as:

A3.5.4.1 Systematic review for fitness of vessel for operations,

A3.5.4.2 Standard operating procedures that incorporate safe work practices. Some activities that might require standard operating procedures with integrated safe work practices include:

A3.5.4.3 Machinery startup and shutdown operations,

A3.5.4.4 Emergency response to machinery failures,

A3.5.4.5 Getting underway and entering port operations,

A3.5.4.6 Cargo loading and unloading operations,

A3.5.4.7 Response to unplanned or emergency situations during cargo operations,

A3.5.4.8 Man overboard procedures,

A3.5.4.9 Lifeboat-launching procedures,

A3.5.4.10 Watchkeeping procedures,

A3.5.4.11 Teamworking procedures such as bridge resource management taught in simulators with practice by actual team members,

A3.5.4.12 Prejob planning and briefings,

A3.5.4.13 Job hazard/safety analyses (JHAs/JSAs),

A3.5.4.14 Emergency procedures,

A3.5.4.15 Systematic inspection of incoming equipment and equipment in use to ensure conformation to specifications identified in the SOHSP (for example, personal protective equipment),

A3.5.4.16 An easy-to-understand labeling system for all possible mechanical and chemical hazards, and

A3.5.4.17 Occupational medical surveillance programs tailored to vessel and cargo hazards.

A3.5.5 Specific programs that need special attention within the overall SOHSP:

A3.5.5.1 Respiratory protection program,

A3.5.5.2 Hearing loss prevention program,

A3.5.5.3 Safe lifting procedures,

A3.5.5.4 Permit-to-work programs for operations such as lock out and tag out, tank or hold cleaning operations, confined space entry, hot work operations, including a gas-freeing program, working aloft, and

A3.5.5.5 Health and safety equipment control, calibration, and maintenance procedures.