

GLNPO
HEALTH, SAFETY & ENVIRONMENTAL
COMPLIANCE

MANUAL

Chapters

FINAL VERSION

AUGUST 1993

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HEALTH, SAFETY
& ENVIRONMENTAL
COMPLIANCE MANUAL

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AUGUST 1993

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
APR	Air Purifying Respirator
ARA	Area Regional Manager
CAA	Clean Air Act: Prevent or control the emission of any substances into the air that may harm public health or natural resources; set standards to define acceptable tolerance levels for air pollutants. (40 CFR 50-80)
CBC	Complete blood count
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act: Original regulatory goal (1980) was focused on the cleanup of abandoned hazardous waste sites nationwide. A government trust fund (the "Superfund") pays for cleanups; EPA identifies potentially responsible parties (PRPs) and orders them to clean up the site or bills for cost of cleanup performed by the government. (40 CFR 300s)
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
Class I	Materials with flash points below 100°F (see 29 CFR 1910.106)
Class II	Materials with flash points at or above 100°F, but below 140°F (see 29 CFR 1910.106)
CNS	Central nervous system
CPR	Cardiopulmonary Resuscitation
CRC	Contamination Reduction Corridor

CRZ	Contamination Reduction Zone
CWA	Clean Water Act: Federal Water Pollution Control Act-FWPCA. Restore and maintain the integrity of surfaced waters in the United States by preventing or controlling pollution, with the ultimate goal of making all surface waters usable for fishing and swimming. (40 CFR 110-140, 40 CFR 400-470)
dBa	Decibels (decibel scale)
DOT	Department of Transportation
U. S. EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act of 1986 (SARA Title III). Establish regulations for industry to report information regarding chemicals stored at facilities; establish a framework for emergency planning; establish reporting procedures for toxic chemical releases. (40 CFR 350, 355, 370, and 372)
EPIRB	Emergency Position Indicating Radio Beacon
FEF	Forced expiratory flow
FID	Flame ionization detector
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act. Establish safety standards for pesticides; restrict the use of, remove from the market, or refuse registration for products that do not need the safety standards. Note that FIFRA broadly defines "pesticides" to cover anything intended to kill, repel, or control any nonhuman form of life, from bacteria-killing disinfectants to herbicides for weed control. (40 CFR 150-186)
FRC	Functional residual capacity
GC	Gas chromatography
GLNPO	Great Lakes National Program Office

GLWQA	Great Lakes Water Quality Agreement
HMTA	Hazardous Materials Transportation Act. Centralize federal regulations for domestic packaging, labeling, and shipping of materials that pose a risk to health, safety, or property. (49 CFR 170s)
IAG	Inter Agency Agreements
IDLH	Immediately dangerous to life or health
kg	kilogram
IR	Infrared
LEL	Lower explosive limit
LFL	Lower flammable limit
ME	Medical Emergency
MEFR	Maximal expiratory flow rate
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
MVV	Maximal voluntary ventilation
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
OSC	On Scene Coordinator
OSH Act	Occupational Safety and Health Act. Assure the safety and health of workers; set standards to reduce or prevent illnesses and injuries among workers. (29 CFR 1910)
OSHA	Occupational Safety and Health Administration

OVA	Organic vapor analyzer
PAPR	Powered air-purifying respirator
PCB	Polychlorinated biphenyl
PDS	Personnel decontamination station
PEL	Permissible exposure limit
PID	Photoionization detector
PMS	Program Management Staff
PPE	Personal protective clothing and equipment
ppm	Parts per million
PSA	Pipeline Safety Acts. Under DOT, set minimum safety standards for the design, construction, and operation of pipelines carrying natural gas, liquefied gas, or hazardous liquids. Standards also cover repair requirements and accident and leak reporting requirements. (49 CFR 190-195)
psi	Pounds per square inch
PVC	Polyvinyl chloride
RBC	Red blood count
RCRA	Resource Conservation and Recovery Act. Regulate the generation, transport, and ultimate disposal of all forms of hazardous waste and industrial by-products, ranging from open garbage dumps to buried chemicals. Drafted as a solid waste disposal/recycling law, actual implementation focuses heavily on identification and tracking of hazardous wastes.

Note that disposal under RCRA may trigger compliance duties under additional laws if land, air or water quality may be affected by the disposal method. (40 CFR 260-263 and 264-270)

REL	Recommended exposure limit
RPM	Remedial Programs Staff
RPS	Remedial Programs Staff
RV	Residual volume
SAR	Supplied-air respirator
SCBA	Self-contained breathing apparatus
SDWA	Safe Drinking Water Act. Establish uniform federal standards for drinking water quality, and set up a system to control underground injection (or burial) of wastes and other substances that could contaminate such underground water sources as municipal water systems, public wells, and sole-source aquifers. (40 CFR 140-149)
SHEMD	Safety, Health, and Environmental Management Divisions
SOLAS	Safety Of Life At Sea
SOP	Standard Operating Procedure
SRS	Surveillance and Research Staff
SSI	Seaward Services, Inc.
TLC	Total lung capacity
TLV	Threshold limit value
TLV-C	Threshold limit value - ceiling
TLV-STEL	Threshold limit value - short-term exposure limit
TSCA	Toxic Substances Control Act of 1976. Evaluate the health and environmental risks of all chemicals before manufacture or use in the United States. EPA gathers data by screening new

and existing chemicals through industry reporting and recordkeeping, including testing for possible risks. (40 CFR 700-750, 40 CFR 760s and 40 CFR 790-799)

TSD	Treatment, Storage, and Disposal Facility
TWA	Time-weighted average
UEL	Upper explosive limit
UFL	Upper flammable limit
USCG	U.S. Coast Guard
UV	Ultraviolet

Chapter 1 - POLICY AND RESPONSIBILITIES

1.1 POLICY

The Great Lakes National Program Office (GLNPO) is responsible for overall coordination of the U.S. EPA's efforts to protect and enhance Great Lakes Water Quality and restore and maintain the beneficial uses of the Great Lakes. GLNPO's role was established through the Great Lakes Water Quality Agreement with Canada and through the Clean Water Act which charges the US EPA through GLNPO for overseeing the implementation of the agreement. The direct authority and responsibility, however, for implementing the CWA and other federal laws necessary to carry out the GLWQA, is the primary responsibility of various headquarters program offices as well as Regions II, III, and V, and the Great Lakes States.

GLNPO is formally located within the Region V management structure, therefore, the safety policies defined here are provided to augment the Region V Safety Plan. This plan is necessary in light of the unique multi-regional and multi-national programs of GLNPO which involve operation of various surveillance and research vessels as well as field demonstration programs. Any safety or compliance issue not covered here is subject to the Region V Safety Manual.

GLNPO HEALTH AND SAFETY POLICY STATEMENT

It is the policy of the US EPA, Great Lakes National Program Office, that all EPA employees working in offices, laboratories, field activities, and special programs are entitled to a comprehensive health and safety program. The goals of the program are to ensure that each employee is able to work in an environment free of recognized hazards and to reduce and mitigate occupational accidents as much as possible. These goals shall be accomplished through:

1. Training employees in the proper techniques for field investigations, proper use of and access to safety equipment, and proper protocol for inspections;
2. Development of standard operating procedures for routine and non-routine work environments;

3. Enabling employees to identify those work situations where they believe a hazard exists without any adverse action taken against the employee;
4. Medical monitoring of employees in risk situations.

By implementing these procedures it is the desire of the U.S. EPA to see that it can mutually share the responsibility to reduce work place hazards and that the Agency can provide the environment for that to occur.

This policy shall be coordinated by the chair of the GLNPO Safety Committee in conjunction with the Regional Safety Manager. In addition to the outlined procedures, this policy shall meet the applicable requirements of the Occupational Safety and Health Administration, the provisions of Executive Order 12196 and other relevant statutes, laws, policies and guidance of the Federal Government regarding occupational health and safety.

1.1.1 Overview

The Great Lakes National Program Office maintains a fleet of four surveillance vessels devoted to limnological research. The fleet consists of the *Lake Guardian*, *Hydra*, and *Mud Puppy* located in Bay City, Michigan, and the *Roger R. Simons* which is in lay-up status in Milwaukee, Wisconsin. The *Lake Guardian* is the primary research platform for GLNPO and back-up support is provided by the *Roger Simons*. Formerly an offshore oil-field supply vessel, the R/V *Lake Guardian* is the newest, largest, and most sophisticated vessel among the fleet. Historically, water used aboard research vessels for engine cooling, in showers, and in sinks was discharged overboard. The *Lake Guardian*, however, is a non-polluting vessel with no overboard discharges.

The *Hydra* is currently in lay-up status and was the principle vessel used during the 1970s and 1980s for sampling Lake Erie when the lake was in its most devastated condition. The *Mud Puppy*, a significantly smaller vessel, is capable of fresh-water sampling excursions in and around rivers, creeks, and streams which flow into the Great Lakes. At both locations, warehouse facilities are conveniently located for vessel maintenance and equipment storage.

In conjunction with the Central Regional Laboratory in Chicago, Illinois, the *Lake Guardian* provides analytical support to GLNPO. Additional GLNPO support facilities are currently under construction in Bay City, Michigan, to house a new main-frame computer and future plans include new laboratories

and research facilities in Bay City.

1.1.2 Research Vessel Physical Characteristics

a. The R/V *Lake Guardian*

Length - 180'	Cruising Speed - 13 mph
Beam - 40'	Fuel Consumption - 75 GPH
Draft - 11'	Range - 9000 miles
Berthing Capacity - 42	Endurance - 15-30 days

b. The R/V *Hydra*

Length - 65.6'	Cruising Speed - 9 mph
Beam - 17.8'	Displacement (loaded) 95 tons
Draft - 6.6'	Range - 500 miles
Berthing Capacity - 8	Endurance - 2 days

c. The R/V *Roger R. Simons*

Length - 122'	Cruising Speed - 10 mph
Beam - 27.5	Displacement (loaded) - 342 tons
Draft - 7'	Range - 1400 miles
Berthing Capacity - 25	Endurance - 7 days

d. The *Mud Puppy*

Length - 33'
Beam - 8'
Berthing Capacity - 0

1.2 PURPOSE

This manual establishes policies, responsibilities, procedures, rules, and guidelines for all GLNPO Occupational Safety & Health and Environmental Compliance Programs. A copy of this manual and the appropriate appendices must be readily available aboard our over-night research vessels. The manual and appendices must also be available in GLNPO offices.

1.3 POLICY AND PROGRAM GOALS

It is the goal of GLNPO to administer its programs in a manner that will assure that its employees are free from recognized hazards.

1.4 RESPONSIBILITIES

The responsibilities of relevant EPA personnel are detailed in the following paragraphs, separated by title.

1.4.1 Assistant Regional Administrator

The Assistant Regional Administrator (ARA) for Planning and Management is the Designated Regional Occupational Safety and Health Official. This ARA is responsible for establishing Regional Health and Safety and Environmental Compliance policies, programs, standards, goals, objectives, and priorities. The ARA is also responsible for establishing an organization including the designation of a Regional Health and Safety Manager with an adequate budget and staff to implement occupational health and safety and environmental compliance programs at all levels throughout Region V and GLNPO.

1.4.2 Regional Occupational Health and Safety Manager

The Occupational Health and Safety Manager, under the direction of the ARA for Planning and Management, is responsible for developing Regional occupational health and safety and environmental compliance policies, programs, standards, goals, and objectives for evaluating the effectiveness of the Region's occupational health and safety and environmental compliance programs at all levels. He/she must also provide technical and management support, direction, and services to all Regional occupational health and safety and environmental compliance programs. Consideration for regulatory applicability will be ultimately determined by the Regional Occupational Health and Safety Manager.

1.4.3 Office Director

The Director of GLNPO is responsible for implementing the Great Lakes National Program Offices Occupational Health and Safety and Environmental Compliance Program and is accountable to the Regional Administrator.

1.4.4. GLNPO Occupational Health and Safety Manager

One Occupational Health and Safety Manager is to be appointed by the GLNPO Office Director. Additionally, each staff will appoint a Health and Safety representative and an alternate who will be responsible for assisting the GLNPO management in directing health and safety activities within the Office and for coordinating such activities with the Regional Safety Manager. The Office Safety Manager will also serve on the Regional Health and Safety Committee. (Safety Representatives may also be appointed at the Branch or staff level.)

1.4.5 Supervisors and Managers

Supervisors and managers are responsible, to the extent of their authority, for providing employees with working conditions free from recognized hazards that are likely to cause death or serious harm (i.e., equipment, place of employment, etc.). Supervisors and managers shall comply with the Region's Occupational Health and Safety and Environmental Compliance Standards, along with all safety rules, regulations, and orders issued by the Region. Furthermore, they are responsible for enforcing these correct work practices.

1.4.6 Project Officers/Work Assignment Managers and Contract Officers

Project officers who manage support contracts and grants for sampling, analyses and boat operations are responsible for assuring that all GLNPO-funded activities adhere to the safety and compliance requirements defined in this manual. This includes medical monitoring and all required certification. It is recommended that this requirement is defined in the scope of work for any GLNPO-funded grants and contracts. Unresolved conflicts should be reported to the GLNPO Safety Manager for resolution.

1.4.7 Contractors and Grantees

All contractors and grantees that are involved in field activities on EPA vessels or equipment are required to have read the contents of this manual as well as adhere to the specific requirements. A system should be implemented that

assures these policies are met as a prerequisite for boarding EPA vessels.

All contracts for contractors performing work for Region V, or for any EPA

activity or organization serviced by Regional Safety personnel, shall contain provisions, in writing, which require contractors and contract personnel to follow, at minimum, the same rules and requirements that U.S. EPA personnel follow while performing similar work. Wherever possible, contractual provisions should require that all safety equipment and services (e.g. personal protective equipment, medical monitoring, training, etc.) be equivalent to that required for EPA personnel in the Region.

1.4.8 Chief Scientist

All GLNPO vessels will have a designated "Chief Scientist" while undergoing EPA surveillance and research operations. The "Chief Scientist" role is defined in **Attachment 1.2**. The "Chief Scientist" should ensure that all survey activities are conducted safely and in compliance with the health and safety protocols of GLNPO.

1.4.9 Employee Rights and Duties

EPA employees are expected to follow all health and safety rules and to perform duties in a manner which will protect their own well being and that of their fellow employees.

1.4.9.1 Employee Compliance

Employees are obliged to follow GLNPO's and the Region's Occupational Health and Safety and Environmental Compliance Standards, rules, regulations, and orders which are applicable to their own job duties, actions, and conduct. Employees are also required to use safety equipment, personal protective clothing and equipment (PPE), and other safety devices and, moreover, to follow safety procedures that the Region deems necessary for their protection.

1.4.9.2 Employee Rights and Responsibilities

The rights and responsibilities of EPA personnel with regard to occupational health and safety are detailed in the "Occupational Health and Safety for Environmental Protection Agency Employees" poster. (**Attachment 1.1**)

1.5 SAFETY COMMITTEE POLICY

The GLNPO Occupational Health and Safety Committee is the medium for achieving the participation of employees in the GLNPO's Occupational Health and Safety Programs. A well-organized, balanced health and safety committee

will have the diversified knowledge of all job operations and activities in GLNPO. The committee is an advisory body, not a policy making group. Committee members review data and render recommendations to aid management in making appropriate policy decisions in the area of health and safety matters affecting employees. The GLNPO Occupational Health and Safety Committee shall:

1. Be effectively supported by management.
2. Be given specific tasks to accomplish, not general topics of consideration.
3. Include personnel from the program areas which committee decisions will affect.
4. Provide effective representation of all GLNPO employees.
5. Include a cross section of experts who have first-hand knowledge of pertinent work conditions and practices.

1.6 SAFETY COMMITTEE ORGANIZATION

Pursuant to the Safety Committee Bylaws and as specified in EPA Order 1440¹, the GLNPO Occupational Health and Safety Committee is similar to the Regional Health and Safety Committee. It is operational in nature, consists of representatives from branches and staffs whose recommendations it will affect.

The committee currently consists of the committee chairperson, who also serves as the Deputy Director of GLNPO, and safety representatives who are appointed by their GLNPO staff or unit chiefs. The number of representatives is not strictly set, nor is the term for each member who serves on the committee. GLNPO consists of the following staffs and units:

¹ See appendix A. Note: This document applies to all federal employees and must be available at all federal facilities for review (e.g. *The R/V Lake Guardian*).

Office of the Director
Data Integration Unit
Program Management Staff (PMS)
Environmental Planning Staff (EPS)
Remedial Programs Staff (RPS)
Surveillance and Research Staff (SRS)

The GLNPO Safety Manager will provide organizational and technical guidelines for the committee including providing an agenda for each meeting and recording and distributing the meeting's minutes.

These Safety Representatives make up the overall operational GLNPO Safety Organization. The GLNPO Safety Organization is an operational group and is managed by the GLNPO Safety Manager. Specific duties of Safety Representatives include coordinating safety inspections and surveys, and scheduling required training, respirator fit testing, medical monitoring exams, and related matters for personnel in their organization. Safety Representatives may serve at the Office, Staff or Unit level and assist the Safety Manager in the overall management of the Health and Safety Program.

All Safety Representatives must report medical monitoring, required training, field certification, respirator fit testing, medical monitoring exams, and related matters to the GLNPO Safety Manager. These reports should be prepared using the designated forms and are to be reported to the GLNPO Safety Manager during the quarterly safety committee meeting. Additionally, Safety Representatives are expected to assist their Division Management in reporting abatement status of health and safety hazards or deficiencies found and cited during Annual and Semi-Annual Occupational Health and Safety and Environmental Compliance Surveys and Inspections.

1.7 COMMITTEE OPERATIONS

The GLNPO Occupational Health and Safety Committee meets every three months, usually on the first Wednesday of the second month of each quarter of the federal fiscal year (November, February, May, August). Issues and subjects discussed at committee meetings include: Vessel Operations, Annual Safety Inspection and Industrial Hygiene Survey results, the Medical Monitoring Program, the Annual Safety Budget, the Radiation Protection Program, the Lab Safety Program, Personal Protective Equipment (PPE), Safety Training Program,

and other organizational and technical issues affecting GLNPO personnel.

The Regional Safety Committee Bylaws, adopted in June 1988, are currently in effect and govern all activities of the GLNPO Safety Committee.

1.8 GLNPO SAFETY PROGRAM GOALS

The GLNPO Safety Manager is responsible for preparing an annual work plan for submittal to the GLNPO Office Director and the Regional Safety Manager. The work plan should outline Regional Safety, Health, and Environmental Compliance Program goals for the coming fiscal year and their proposed method of implementation. Time frames for implementation should also be included. The goals and their implementation should be proactive and designed to build and improve the Regions' proactive Safety, Health, and Environmental Compliance Programs.

1.9 PROGRAM BUDGET AND RESOURCES

The GLNPO Safety Manager shall ensure that all Safety, Health, and Environmental Compliance submissions include proposed funding and resources for implementation. He/she, in conjunction with the Regional Safety Manager, will effectively administer the GLNPO Occupational Safety, Health, and Environmental Compliance Programs for all Offices, Staffs and Units in GLNPO.

Appropriate funds and other resources for administering the programs shall provide for, but not be limited to:

1. Sufficient personnel resources (including contract resources) to implement and administer the overall program at all levels;
2. Necessary administrative costs for such services as training, personal protective equipment, etc.;
3. Contracts and IAGs for medical monitoring, complete hygiene, and environmental compliance services including laboratory analysis and hazardous waste disposal services;
4. Safety and health sampling, testing, and diagnostic and analytical supplies and equipment;

5. Program training and promotion materials such as posters, slides, films, and video tapes, and;
6. Technical information, documents, books, standards, codes, and publications.

Most of these services will be provided through the Regional Health and Safety Manager to avoid duplication of effort. Appropriate contracts and grant funds will be provided to the Regional Health and Safety Manager for provision of these services.

1.10 DISSEMINATION OF OCCUPATIONAL HEALTH AND SAFETY PROGRAM INFORMATION

The GLNPO Safety Manager shall promote employee awareness of Occupational Safety, Health, and Environmental Compliance Programs by:

1. Providing, upon request, copies of Executive Order 12196, 29 CFR 1910, and the Region's Occupational Health and Safety Program to all employees. Also, copies of Agency and Regional standards and other applicable occupational health and safety standards shall be available to all employees for review upon request.
2. Posting a copy of the Agency's Policy poster in a conspicuous location in each Agency facility.
3. Bringing Occupational Health and Safety issues to the attention of employees through in-house publications, forums, and promotional materials.

1.11 WORKER'S COMPLAINTS

If an employee considers a situation or a work condition to be a safety hazard, it is his/her responsibility to report it directly to the Safety Manager or his/her staff/unit or office Safety Designee. It is an employee's responsibility to report potential safety hazards. (No one can take action against an individual who reports a safety problem.)

1.11.1 Reporting

Potential safety hazards should be reported in writing to the GLNPO Health and Safety Manager as soon as they are recognized. The GLNPO Health and Safety Manager, in conjunction with the Regional Health and Safety Manager, and his/her staff will investigate the situation and recommend corrective actions, if necessary. The Regional Health and Safety Office will either make these corrections or pass along their recommendations to a more appropriate party, i.e. the General Services Administration, building management, etc.

1.11.2 Recordkeeping

Copies of all employee complaints, as well as documentation of corrective actions, are kept on file in the Regional Health and Safety Office.

1.12 INJURY & ILLNESS

When an EPA employee suffers an injury, whether traumatic or nontraumatic, or is stricken ill while on the job, there are necessary procedures to be followed in order to protect the employee's interests and well being. These procedures are defined in the following Sections 1.12.1 and 1.12.2.

1.12.1 Injury and Illness Definitions

Injuries are considered either "traumatic" or "nontraumatic." A "traumatic injury" is defined as a wound or other condition of the body caused by an external force, including stress or strain. A "nontraumatic injury," also referred to as an "occupational disease or illness," is a condition caused or aggravated by working in a job environment over an extended period. This includes injuries and illnesses caused by repeated stress or strain, systemic infection, and those caused by continuous or repeated exposure to toxins, poisons, fumes, etc.

1.12.2 Reporting Procedures

Employees must report all accidents or incidents, which may result in an injury, to their immediate supervisor and may do so without fear of reprisal. Moreover, it is in the employee's best interest to report all injuries sustained on the job, regardless of how minor they may appear, because a slight injury could develop into something more serious.

Specific forms are used for reporting an injury. When reporting a traumatic injury, complete Form CA-1, "Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation." When reporting a nontraumatic injury, complete Form CA-2, "Federal Employee's Notice of Occupational Disease and Claim for Compensation." (These forms are available through the Human Resources Department.) If an employee is incapacitated and unable to complete these forms, another person (coworker, supervisor, etc.) may complete them. All forms should be signed by this other person and forwarded to the employee's supervisor.

The following steps should be taken consecutively by an employee in the event of a traumatic injury:

1. Report the injury or incident to your supervisor as soon as possible.
2. Obtain medical attention. Emergency treatment does not require prior authorization. In case of non-emergency treatment, your supervisor must first complete a CA-16 form (within four hours of an employee's request) in order to authorize medical treatment. (This form is valid for 60 days from date of issue unless canceled by the OWCP.) Choose a local federal medical officer/hospital, if available, or a local private physician/hospital, and schedule a consultation. Bring the CA-16 form and form HCFA 1500 (standard billing form) with you to your appointment.
3. File an official written notice of a traumatic injury within two working days, using form CA-1. (Continuation of Pay cannot be authorized if this form is filed more than 30 days after the date of injury. Compensation may be paid if this form is filed within 3 years of the date of injury.) Form CA-2 is filed instead of form CA-1 if disability results from an occupational disease or illness.
4. Retain a "receipt" of Notice of Injury from your supervisor for your personal records. It is attached to Forms CA-1 and CA-2.
5. If disabled as a result of a traumatic injury, the employee may choose to take leave or request Continuation of Pay (maximum of 45 calendar days.) If disability is a result of an occupational disease, an employee may use leave or request compensation using Form CA-7.

Six claim forms must be completed in order to document your injury/incident

and initiate a worker's compensation claim with the Department of Labor. These forms are to be completed in the following order by the corresponding party:

Employee: CA-1 (front) complete your portion and forward to your supervisor, or

CA-2 (front) complete your portion and forward to your supervisor

Supervisor: CA-1 (back) or

CA-2 (back) and

CA-16 (front) complete section before employee goes to doctor, return to employee; or a

CA-17 (front) complete section before employee goes to doctor, return to employee; and an EPA-1440-9, distribute copies as follows: original to EPA, Occupational Health and Safety Staff ,(PM-273), Washington, D.C. 20460; goldenrod copy to employee; pink copy for supervisor's files; and green copy (along with original CA-1 or CA-2) to Personnel Office or Employee Compensation Coordinator; and a

Supervisor: CA-3 complete when employee returns to work if they have lost time from work

Physician: CA-16 (back) or a
CA-17 (back) and an
HCFA 1500 (standard billing form)

NOTE: For the employee's own protection, copies of all forms and documents should be made for his/her personal files.

1. 12.3 Investigation

Investigation of an accident or illness is necessary to prevent similar occurrences. It is not designed to establish guilt or innocence, but is an attempt to identify and abate potential hazards. Investigations should be conducted promptly by both

the employee's supervisor and the Occupational Health and Safety Designee. Both parties should gather and document all facts and statements concerning an incident, make recommendations for resolution, and provide each other with copies of findings, as well as to the employee involved. Further details of investigative procedures are available in the Occupational Health and Safety Manual.

1.12.4 Recordkeeping

Under OSHA regulations, it is the responsibility of the Safety Office to maintain and keep current two OSHA Forms. "The Log of Federal Occupational Injuries and Illnesses" is used for compiling data and statistics on injuries and illnesses. "The Annual Summary of Federal Occupational Injuries and Illnesses" is a questionnaire completed by each Region for Headquarters in order to assist them in preparing the annual health and safety summary of the Agency for submission to the Department of Labor. This log and information will be kept at the Regional Safety Office.

Occupational Health and Safety for Environmental Protection Agency Employees

Occupational Health and Safety Policy

The Environmental Protection Agency shall administer its programs in a manner that will assure its employees places and conditions of employment free from recognized hazards which are likely to cause death or serious harm.

Agency Responsibilities

Designate an Occupational Health and Safety Official to administer EPA's health and safety programs. This Official is

Name _____

Title _____

- Furnish employment and a place of employment free from recognized hazards.
- Comply with OSHA standards or develop more stringent alternate standards.
- Ensure that the performance evaluation of all managers and supervisors measures his/her performance in meeting requirements of EPA's Occupational Health and Safety Programs.
- Acquire, maintain, and require the use of approved personal protective equipment and approved safety equipment.
- Authorize Agency health and safety personnel to utilize expertise from other agencies, professional groups, consultants, universities, labor organizations, health and safety committees, and other appropriate sources.
- Ensure appropriate resources to effectively implement and administer the Agency's Occupational Health and Safety Programs.

Occupational Health and Safety Responsibilities

- Develop an Agency Occupational Health and Safety Program that includes policies, programs, standards, goals, and objectives.
- Evaluate the effectiveness of the Agency's Occupational Health and Safety programs at all operating levels.
- Provide technical support.

Supervisor Responsibilities

To the extent of their authority, Supervisors shall:

- Provide his/her employees with employment and places of employment free from recognized hazards.
- Comply with all health and safety standards and with all rules, regulations and orders issued by the Agency.
- Enforce safe work practices.

Employee Responsibilities

- Comply with the Agency's Occupational Health and Safety standards, rules, regulations, and orders applicable to their own actions and conduct.
- Use the safety equipment, personal protective equipment and other health and safety devices provided by the Agency.
- Follow the procedures, provided or as directed, that the Agency deems necessary for their protection.
- Report all work-related property and personal accidents, and illnesses to their supervisor.

Employee and Employee Representative Rights

- Access to copies of the Agency's standards, injury and illness statistics, and procedures.
- Comment on standards proposed by the Agency.
- Participate or assist in inspections and tell inspectors about unsafe or unhealthful working conditions.
- Authorized official time to participate in the Agency's Occupational Health and Safety Program activities.
- May decline to perform assigned tasks because of a reasonable belief that under the circumstances the task poses an imminent risk of death or serious

bodily harm and that there is not time to go through established reporting and abatement procedures.

- Report unsafe or unhealthful working conditions to appropriate officials. (See Chapter 4 of the Agency's Occupational Health and Safety Manual for detailed procedures.)

- Appeal if you disagree with the Agency's disposition of an unsafe or unhealthful working condition. Write appeal to:
Office of Federal Agency Safety and Health Programs, OSHA
U.S. Department of Labor
Washington, D.C. 20310

Discrimination

If you exercise your rights under the Agency's Occupational Health and Safety Programs, you are protected from any discrimination, restraint, interference, coercion or reprisal.

Occupational Health and Safety Committee

EPA requires that an Occupational Health and Safety Committee be established at each Agency Reporting Unit and Establishment. Membership of these committees must be determined to provide for effective representation of all employees. Your Occupational Health and Safety Committee Chairperson is:

Name and Title _____


Location and Telephone Number _____

Further Information

Further information regarding EPA's Occupational Health and Safety Programs, its standards and procedures, the Federal law, or any other information on health and safety is on file and can be reviewed in the Office of the Occupational Health and Safety Designee.

Name and Title _____

Location and Telephone Number _____

 *William K. Felt*
United States
Environmental Protection
Agency

11/11 8 1993

Attachment 2 – THE GLNPO CHIEF SCIENTIST

The duties and responsibilities statement establishes standards for performance as a CS (Chief Scientist) against which both certified and candidate Chief Scientists can be evaluated. These are classified into two categories; scientific/technical and managerial.

Duties and Responsibilities

Chief Scientists will be expected to perform a variety of duties and fulfill specific obligations as technical leaders of the survey party.

Scientific/Technical Responsibilities: Scientific/technical responsibilities include oversight of sampling activities, QA/QC, and survey and data collection methods. In particular, Chief Scientists will be expected to:

- Assure survey plans and reports are complete, accurate, and technically sound;
- Coordinate activities with the vessel's captain regarding sampling procedures and schedules, and special needs or precautions for specific types of samples;
- Assure that the methods used are scientifically sound, in compliance with a QA/QC plan, and well-documented in the survey summary;
- Monitor sampling activities to assure that all samples are collected, tracked, and handled properly, and that techniques are consistently applied throughout each work shift of the survey;
- Resolve conflicts regarding survey methods, data collection and analysis as they arise; and
- Make final decisions regarding sampling priorities and methods when time and adverse weather conditions become limiting.

Managerial Responsibilities: Managerial responsibilities include providing leadership, oversight of project activities, communication with crew, and compliance with safety requirements. In particular, Chief Scientists will be expected to:

- Assure that survey plans and reports are completed properly and on time;
- Assure all necessary equipment is acquired and is in good condition prior to survey departure;
- Maintain morale and encourage teamwork during surveys;
- Assign duties and monitor progress and quality of work as it is completed;
- Assure that a log of survey activities is maintained (as appropriate);
- Ensure that all survey activities are conducted safely and in compliance with health and safety protocols; and
- Support public outreach activities.

Record of Satisfactory Completion of Training

A checklist of requirements and performance evaluation forms will be provided to each candidate upon selection to the program. The candidate will be responsible for documenting satisfactory completion of each module throughout the program. This will include obtaining signatures and any relevant comments from each training instructor throughout the certification and training programs.

Core Training Curriculum

Topic

Trainer

Monitoring design, data quality objectives
and power analysis

Chief Scientist

Survey planning and reporting

Chief Scientist

Equipment use (sampling/deck gear)

Chief Scientist

Ship operations and communications

Chief Scientist

Topic

Trainer

Navigation and positioning theory,
applications, equipment

Captain or Chief Scientist

Health and safety (including protocols)

EPA Health and Safety Office

Public outreach and press relations	Regional Public Affairs Personnel or Outside Expert
Interpersonal communications/conflict resolution	Regional Public Affairs Personnel or Outside Expert
Emergency response (assessment only)	Risk Reduction Engineering Laboratory/ORD in Cincinnati, OH
	Oil and Hazardous Materials Spills Branch/ORD in Edison, NJ
Enforcement	EPA Enforcement Office

The Practicum

The practicum portion of the training program is intended to provide hands-on experience to allow the candidates to apply and demonstrate what was learned during classroom training. Candidates will begin as survey party members on EPA vessels and assume other responsibilities as their capabilities dictate. Each candidate's mentor (discussed below) will recommend a pace for advancement and will review progress during practicum work.

Prerequisites

Prior to beginning the practicum, certain prerequisites must be met. Candidates must complete CPR and first aid certification. It is also recommended that the candidate complete the EPA Field Safety Class and diver certification program to the level of working diver. Training of Chief Scientists in these areas will help further the EPA's safety record.

Mentoring

OCPD believes that the most effective method for developing Chief Scientists is through a mentor-candidate relationship. Candidates will be required to have a mentor to guide their progress throughout the certification program. In many cases, it may be necessary for OCPD to assist in securing mentors for prospective candidates. The mentor will be expected to give advice, review survey plans and reports prepared by the candidates, evaluate candidate's performance, provide feedback to candidates on areas for improvement, and make recommendations to the Chief Scientist Certification Board.

The role of the mentor will be to provide guidance to the candidate during the practicum. He or she will review survey plans and reports which the candidate

drafts, and may provide training to cover classroom training modules that may have been missed.

Another role of the mentor will be to allow the candidate to “act” as the Chief Scientist on at least one trial survey. The mentor may also recommend experiences in other geographic areas and survey types and arrange for participation in surveys with other Chief Scientists. The candidate does not need to complete all practicum requirements under the mentor’s direct supervision. Other certified chief scientists can supervise candidates during practicum surveys.

The mentor will follow the candidate’s progress and evaluations during each practicum stage (as listed below) and will discuss with each survey chief scientist the candidate’s progression to the next stage. When the candidate has completed the requirements for certification, the mentor will recommend certification to the Board and provide other information as requested.

Requirements and Stages of Practicum Progress

The candidate will be required to complete a minimum of three surveys aboard an EPA vessel. The individual will assume increasing responsibility over time, with approval from the mentor.

Specifically, the stages of practicum progress are:

- Participating in a survey as a survey party member,
- Serving as Watch Captain on a survey, and
- Serving as Apprentice Chief Scientist during a survey under supervision by a certified Chief Scientist.

At each level, the candidate will be required to develop survey plans and post-survey reports. The candidate will be expected to demonstrate knowledge and understanding of each of the classroom training modules and will be responsible for recording these activities and obtaining appropriate signatures on the candidate’s checklist and performance evaluation forms. The candidate should develop a broad base of experience through the practicum. He or she should participate in a variety of survey types including a diving survey. During the practicum, the candidate should be exposed to the full range of equipment

operation and participate in at least one survey conducted by an office other than his own. For example, a Region IV candidate, who is primarily involved with dredged material disposal site surveys, could participate in an aquatic debris survey conducted by headquarters personnel.

Chapter 2 - TRAINING, CERTIFICATION, AND MEDICAL MONITORING

REQUIRED TRAINING POLICY - OVERVIEW

It is the policy of the Great Lakes National Program Office that all EPA personnel and research vessel occupants, including ship contractors, laboratory contractors, and visiting scientists, have appropriate safety training specific to their job functions in accordance with EPA requirements. All required courses will be provided by the EPA Safety Manager, with the exception of Superfund training. (Superfund training will be provided by the Office of Superfund.) Training courses will be offered on an annual basis.

GLNPO training courses encompass a wide range of criteria including laboratory safety training, radiation safety training, field health and safety, first aid and CPR, respiratory protection training, emergency response, fire fighting, crane operation, industrial truck operation, occupational noise exposure, hazard communication, confined space entry, hot work and lockout-tagout procedures, as well as bloodborne pathogen training. In addition to training courses, GLNPO adheres to the regional medical monitoring selection policy followed by all EPA Region V employees.

2.1. Required Training Policy

All EPA and Contractor personnel who work in EPA owned or leased laboratory space (including laboratories on research vessels, and all field locations) must meet the safety training requirements specified in EPA Order 1440 and Regional Safety Manuals. These Regional Safety Manuals must be readily accessible at all locations. Supervisors must assure that their employees are aware of these manuals and that the requirements within the manuals will be implemented. Chapter Eight of EPA Order 1440 specifically addresses working with toxic substances in laboratories. Regional and laboratory safety regulations are designed to comply with the OSHA regulations 29 CFR Part 1910 "Occupational Exposures to Hazardous Chemicals in Laboratories". All laboratories are required to have a site-specific safety manual. The manual should include general laboratory safety rules, fire escape plans, emergency plans, environmental compliance rules, and a chemical hygiene plan. All laboratory personnel must receive training based on the content of the manual and must know its location for reference purposes.

2.1.1 24-Hour Laboratory Safety Course

As specified in Order 1440, Chapter Eight, a 24-Hour Laboratory Safety Course must be completed by all EPA and contractor personnel prior to working in an EPA laboratory on a full-time or part-time basis. The 24-hour Laboratory Safety Course is designed to cover all aspects of laboratory safety. New employees must receive on-the-job training including fire evacuation procedures, waste disposal procedures, protective equipment requirements, the location of eyewashes, fire alarms, spill control stations, and any site-specific safety rules. Topics such as potential sources of exposure, adverse health effects, work practices and engineering controls, environmental and medical monitoring procedures, and storage of incompatible materials should be covered, as well. Additionally, since all laboratories generate wastes, and some of these wastes are hazardous under the RCRA regulations, the 24-hour training must include information regarding environmental compliance. This will ensure that laboratory personnel will understand compliance according to RCRA regulations and how it relates to their work practices. For further information, please refer to EPA Headquarters Order 3500.1 entitled "Training and Development for Compliance Inspectors/Field Investigators". In the event a new employee begins work in a laboratory prior to scheduled training, the employee should review the materials provided for the Laboratory Safety Class and refresher class. The employee should then be enrolled in the first available Laboratory Safety Class.

A training agenda for the 24-hour course can be found as Attachment 2.1 of this chapter.

"General Laboratory Safety Rules" appear as Attachment 2.2 of this chapter.

2.1.2 4-Hour Laboratory Safety Refresher Course

Following the completion of the 24-hour Laboratory Safety Course, an annual refresher course is required thereafter. The 4-Hour Laboratory Safety Annual Refresher Course is mandatory for all EPA and contractor personnel who work in EPA laboratories and is designed to review safety topics for personnel who already have a basic understanding of safety rules. Recent advances in health and safety regulations should be included during this refresher training. The 4-Hour Laboratory Safety Annual Refresher Course agenda appears as Attachment 2.3 of this chapter.

2.1.3 GLNPO Research Vessel Laboratory Training Requirements

In addition to the 24-hour Laboratory Safety Course and the annual 4-hour Refresher Course, all laboratory personnel are required to attend a "site-specific" training orientation course prior to engaging in laboratory activities. This course is intended to familiarize EPA personnel and contractors with the laboratories in which they will work. An Annual Refresher Course is required for this training and participants are required to document attendance. The general training agenda for the course appears as Attachment 2.4 of this chapter.

2.1.4 Radiation Safety Training

The U.S. Nuclear Regulatory Commission's Material License issued to the U. S. EPA Central Regional Laboratory (CRL) allows the limited use of radioactive materials aboard GLNPO research vessel laboratories. This license also allows GLNPO laboratories to use Carbon 14 and Nickel for laboratory research and sample analysis. While these materials may be used on a limited basis, Radiological Health and Safety Plans, in accordance with the U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 8.8 and DOE publication PNL-6577, will be implemented to maintain the lowest minimum exposure to personnel. Use of these materials are subject to the guidelines specified in the CRL Radiation Safety Manual as described in Appendix J of this manual. GLNPO research vessels must also follow the guidelines presented in the Chemical Hygiene Plan described in Appendix J of this manual.

A site-specific Radiation Safety Training Course is required for GLNPO personnel and contractors prior to working in a GLNPO facility where radioactive materials are used. This training must provide information on work operations using radioactive materials, personnel monitoring, protective clothing, and bioassay. These training requirements appear as part of the Chemical Hygiene Plan described in Appendix J of this manual and radiation safety SOPs appear as an attachment to the plan.

2.1.5 40-Hour and 24-Hour Field Health and Safety Training

Health and Safety training is required for all EPA field personnel. The training consists of a 40-hour Superfund Hazardous Waste Site Training Course for all OSCs, RPMs, and related personnel. All other field personnel, including inspectors, are required to take the EPA 24-hour Field Safety Training Course. All

training requirements will be in accordance with EPA Order 1440.2.

Since specific protection cannot be engineered into every field situation, it is essential that employees are trained to implement safe operational procedures and are familiar with the proper use of personal protective clothing and equipment. GLNPO employees and contractors, therefore, must successfully complete the 24-hour or 40-hour training required and hold certifications attesting that these requirements have been met. GLNPO employees and contractors are not permitted to engage in routine field activities until they have been trained and certified.

No persons, field EPA employees, or contractors will be permitted to participate in GLNPO-sponsored activities until they have received appropriate training .

2.1.6 8-Hour Field Health and Safety Annual Refresher Training

After certification in the 40-hour or 24-hour Field Health and Safety Training Courses, all GLNPO employees and contractor personnel are required to complete the 8-hour Refresher Training Course on an annual basis. The refresher instruction is designed as a review of subject areas necessary to maintain certification based on the initial 40-hour and 24-hour training.

For further details on this subject, refer to EPA Order 1440.2 Transmittal July 12, 1981.

2.1.7 First Aid and CPR

EPA employees classified as Chief Scientist and contractor personnel who work on board GLNPO vessels are required to attend an 8-hour course in First Aid/CPR.

CPR

Courses in Cardiopulmonary Resuscitation (CPR) will be offered throughout the year. Training may be given by fellow employees who are certified instructors or by instructors from an outside agency. Assuming that "someone else" will know CPR is a dangerous assumption. All EPA personnel aboard GLNPO vessels are required to attend an annual 4-hour course in CPR.

First Aid

First Aid, like CPR, will be taught throughout the year. This course is valuable to all, but especially important to personnel who are engaged in potentially hazardous activities. Like CPR, knowledge of First Aid is valuable outside the work place, as well. All personnel who are required to work on GLNPO research vessels must attend a 4-hour training session in First Aid, at minimum, once every three years.

2.1.8 Respiratory Protection

Employees performing tasks requiring the use of respiratory protective devices must receive training in the use and limitations of a respirator. Personnel must also be evaluated by a physician to ensure they are medically fit to wear a respirator. If respirators are issued, a written Respiratory Protection Program must be implemented. Training and program requirements can be found in OSHA 29 CFR 1910.134 and EPA Order 1440.3.

A written Respiratory Protection Program for GLNPO research vessels is described in **Appendix A** of this manual. All Emergency Response Personnel aboard the vessel must meet the requirements specified in the program.

2.1.9 Emergency Response Team Training

Prior to each GLNPO research vessel survey, it is necessary to have a designated emergency response team. The team must be trained in spill response, respiratory protection (including SCBA), and emergency response in accordance with OSHA 1910.120. The team members must also be trained in CPR and first aid and conduct practice drills on an annual basis.

In the event anyone aboard a ship at sea becomes ill or is injured beyond the clear capability of the ship to provide prompt and adequate care, a Medical Emergency (ME) exists and that person should be transferred to a facility providing emergency medical treatment.

If the Captain (or officer in charge) determines that a possible ME exists, the U.S. and/or Canadian Coast Guard should be contacted for advice and assistance. The Coast Guard may be hailed on radio Channel 16 throughout all the Great Lakes. The Coast Guard can provide medical consultation and evaluation of the situation and are equipped for evacuation by boat or helicopter, if needed.

Always contact the Coast Guard for advice. Not all ports have emergency medical facilities and not all may be suitable for a particular ME.

These procedures and numbers should be readily available for all employees aboard GLNPO research vessels.

Telephone numbers for Coast Guard areas and designated trauma centers appear as **Attachments 2.5** of this chapter.

2.2 SAFETY TRAINING FOR SHIP OPERATING PERSONNEL

Ship operating personnel must receive training specific to their job functions in accordance with all regulatory and policy requirements. Specific training areas such as fire fighting, heavy equipment operation, and powered industrial truck operation, are detailed in the following sections.

2.2.1 Fire Fighting

In the event of fire, a well-trained fire brigade must be available to respond immediately and be accompanied by a qualified chief in command. All members of the GLNPO research vessel fire brigade must be trained in accordance with the U.S. Coast Guard's fire brigade requirements. Training must include discussions of fire principles and fire classification, the use of portable fire extinguishers and proper extinguishing methods, in addition to overall fire safety awareness. Other qualifications of the brigade must include training and experience in fire protection and prevention in addition to well established firefighting organizational capabilities.

Response teams must be available 24 hours a day and regularly scheduled training for all members of the team must be conducted. Training sessions, at least one hour per week, are recommended. These sessions should include proper procedures on how to avoid fire, hands-on training for drills, including signals and individual responsibilities, as well as procedures for the prevention of bodily injury. A portion of this training must be devoted to the practice of emergency exit drills to make certain that all exits are clearly marked and easily passable and that all alarms are in maximum working order. Any deficiencies noted during drills or regular inspections must be corrected immediately.

Training documentation must be made available aboard the vessel and must include the date of training, name and social security number of the individual trained, and the name and qualifications of the trainer.

2.2.2 Cranes

Persons responsible for the operation of cranes, derricks, or hoists on all GLNPO research vessels are required to receive annual training in the proper use of Ship-Mounted Load Handling Equipment. Training documentation must be made available aboard the vessel and must include the date of training, name and social security number of the individual trained, and the name and qualifications of the trainer.

2.2.3 Powered Industrial Trucks (Fork Lifts)

The operator is one of the most important factors in the safe operation of industrial or fork-lift trucks. To ensure operator competence, and mental and physical fitness, training is required. Initial training must be performed in accordance with the National Safety Council Guidelines followed by refresher courses every two years. Training must include:

- Operator safety rules
- Basic material handling techniques
- Basic instruction on the operation of the truck
- A driver's performance test on an obstacle course which simulates actual driving conditions (e.g. maneuverability)

The operator should be trained to distinguish the differences between a fork-lift truck and a conventional car or truck. For example:

- A lift truck can be steered by either the front or rear wheels
- A lift truck steers more easily loaded than empty
- A lift truck is often driven as much in reverse as in forward gear

Employees who are assigned to operate powered industrial trucks and/or lift trucks should be given a certification card and should be required to carry it. "Rules of Operation" - Safety rules of operation will be given to all industrial truck and lift truck operators. These rules are described in **Attachment 2.6** of this chapter.

2.3 DOCUMENTATION

Documentation for all EPA required training courses and field certifications must be maintained by the branch or office safety representative, the GLNPO Safety Manager, the Branch or Division Safety Representative, the EPA Safety Manager, and the EPA Training Officer. In all cases, each attendant of an EPA required safety course must complete a Standard Form 182 prior to training and forward it to the Regional Training Officer. The information contained in this form will establish a permanent record and be maintained in the Human Resources Branch Training Data Management System.

The GLNPO Safety Manager will record and certify that annually required training courses have been attended by each field inspector or field personnel and issue proper documentation in the form of a certification card. The GLNPO Safety Manager will also be responsible for maintaining annual medical monitoring and respirator fit testing certification for appropriate field personnel.

2.4 MEDICAL MONITORING SELECTION POLICY

The Regional Medical Monitoring Selection Policy is detailed in Regional Order 3130 and is to be followed by all EPA Region V employees to whom it applies. The purpose of the Regional policy is to ensure consistency in EPA's approach to mandatory participation in the Medical Monitoring Program and to ensure that EPA provides the most comprehensive health protection possible for its employees. This program is specifically designed to monitor the health of employees whose work regularly or periodically poses the possibility of exposure to hazardous materials.

Medical monitoring may consist of a series of blood chemistry tests, urinalysis, pulmonary function tests, hearing testing, and chest x-rays. Other types of monitoring may be necessary based on the various hazards encountered by individual personnel. A physician is responsible for identifying and explaining the significance of all findings. No employee should leave the health unit with unanswered questions. Baseline or preplacement examinations are conducted prior to a job assignment where exposure to toxic substances or hazardous materials may be possible.

Three categories in which Medical Monitoring is mandatory are Hazardous Waste Site Workers, Laboratory Personnel, and Other Field Personnel or Inspectors who are exposed to toxic chemicals. Based on this policy, all GLNPO employees who

work with potentially toxic chemicals must be monitored for exposure.

The written Medical Monitoring policy is described in **Appendix B** of this manual.

2.5 ADDITIONAL HEALTH AND SAFETY COURSES

As well as courses that are required for field and laboratory personnel, other courses will be offered that are intended for all employees, including office workers who do not routinely work in unsafe situations. Courses for non-field/lab personnel will be offered that address potentially serious health risks. Some courses will be offered consistently throughout the year while others will be specially scheduled.

2.5.1 Occupational Noise Exposure

In 1983 OSHA promulgated a hearing conservation amendment to the 1971 noise standard. This standard defines an effective program and requires that a hearing conservation program be implemented if workers are exposed to levels equal to or greater than 85 dB measured on the A scale (slow response). When employees are subjected to noise at or above this PEL, regulations state, "the employer shall administer an effective hearing conservation program". Note: EPA employees and contractors, including all GLNPO personnel, are required to wear hearing protection in all work spaces where noise levels reach or exceed 85 dBA.

The hearing conservation program for GLNPO research facilities is described in **Appendix C** of this manual.

2.5.2 Hazard Communication

GLNPO will ensure that a Hazard Communication Program is in place on all research vessels and that all non-laboratory personnel aboard the vessels are familiar with the program. The Hazard Communication Program will be based on the Occupational Safety and Health Administration's regulation stated in 29 CFR 1910.1200. The program will contain a chemical inventory list, material safety data sheets, proper labeling requirements, and employee training specifications. The Hazard Communication Program for GLNPO is described in **Appendix D** of this manual.

2.5.3 Confined Space Entry

The Occupational Safety and Health Act of 1970 lead to the development of the Safety Training and Education Standard (29 CFR 1926.21) for confined spaces. This standard defines a confined space and requires that employees who enter confined spaces are trained to recognize the hazards of a confined space and know the precautions to take when entering and working in such a space. Training is also required for the use of appropriate personal protective and emergency equipment when working in or around confined spaces.

After review of fatality and injury data, the Occupational Safety and Health Administration found the existing standards to be inadequate in protecting workers from the hazards of confined spaces. In June, 1989, OSHA proposed a new rule for the protection of workers in general industry who work in confined spaces. This rule would require the development of a permitting system for confined space entry, and would address training, monitoring, and equipment necessary for entry into confined spaces. As of April 15, 1993, the permit, Required Confined Spaces Rules, has become effective as stated in 29 CFR Part 1910.146, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor. Further information concerning the Confined Space Entry Program and its requirements is described in Appendix E of this manual.

2.5.4 Hot Work Procedures

If proper safeguards are not implemented, activities such as cutting, welding, heating, grinding or other activities that produce a flame or spark have the potential for creating a fire or explosion. To minimize hazards associated with hot work, Standard Operating Procedures (SOP) should be developed and followed.

These procedures should include measures for protecting the worker, the establishment of a hot work permitting system, monitoring for chemical exposure, and monitoring for fire and explosion potential. When welding, cutting, or heating, all personnel and contractors must comply with OSHA 29 CFR 1926.353 for Ventilation and Protection in Welding, Cutting, and Heating During Construction Activities. OSHA 29 CFR 1910.252, General Requirements, must also be followed. Additional information outlining Hot Work Procedures is described in Appendix F of this manual.

2.5.5 Lockout/Tagout

The purpose of lockout/tagout is to control the release of potentially hazardous energy. The unexpected energization of machines or equipment, or release of stored energy, can cause injury or death. Based on this definition, GLNPO's Lockout/Tagout program is based on the Occupational Safety and Health Administration's (OSHA) Control of Hazardous Energy Sources Standard found in 29 CFR 1910.147. The program is designed to safeguard the health and well being of GLNPO and contractor personnel from a variety of energy sources when performing daily repairs, maintenance, and servicing of their operating equipment. To minimize hazards associated with these activities, personnel must be trained to follow proper lockout/tagout procedures specified in the written program.

The GLNPO Lockout/Tagout Program includes energy source surveys, designations of authorized personnel, affected personnel, training, lockout/tagout methods and procedures, restoring equipment to use, and outside contractor information exchange. The GLNPO Lockout/Tagout Program is described in **Appendix G** of this manual.

2.5.6 Bloodborne Pathogens

If it is reasonably expected that an employee may be exposed to human blood or other potentially infectious materials, employers must protect their employees from the hazards of bloodborne pathogens and comply with the OSHA Bloodborne Pathogen Standard, 29 CFR 1910.1030. The standard requires procedures for the use of universal precautions, engineering controls, personal protective equipment, proper housekeeping, training, and handling of regulated waste. Due to the isolated nature of GLNPO research vessel shipboard operations, emergency First Aid response may be necessary and exposure to potential bloodborne pathogens may occur. Based on this assessment, a Bloodborne Pathogen Program has been developed for GLNPO research vessels and is described in **Appendix H** of this manual.

Attachment 2.1

Training Date: _____
Time: _____
Conducted By: _____

24-HOUR LABORATORY SAFETY
TRAINING AGENDA
GREAT LAKES NATIONAL PROGRAM OFFICE
RESEARCH VESSEL PERSONNEL

1. IDENTIFICATION OF HAZARDOUS MATERIAL
2. POTENTIAL SOURCES OF EXPOSURE
3. TOXICOLOGY
4. METHODS OF CONTROL
 - A. Flow Relationships in Hazardous Materials Laboratories
 - B. Ventilation
 - C. Work Practices (Chemical Handling Protocols, Handling and Labeling)
5. MONITORING
6. PERSONAL PROTECTIVE EQUIPMENT
 - A. Clothing
 - B. Emergency Eyewash & Showers
 - C. Respiratory Protection
7. SPILL CONTROL
8. WASTE AND STORAGE MANAGEMENT
9. CHEMICAL HYGIENE PLAN
10. CONTINGENCY PLAN

Attachment 2.2 – GENERAL LABORATORY SAFETY RULES

All laboratories and analytical procedures have certain dangers in common. Almost all analytical procedures use chemicals that are considered toxic or hazardous; examples include acids, bases, and organic solvents. The samples for analysis often contain unknown biological hazards or hazardous and toxic chemicals. For these reasons, certain safety precautions are necessary throughout all laboratories and whenever handling an unknown sample.

Each laboratory and analytical procedure will have safety rules specified in the Laboratory Safety Manual or Standard Operating Procedure. These manuals and procedures will be specific to each laboratory, however, the following laboratory safety rules listed below will apply to all U.S. EPA Region V laboratories:

1. All exits and passageways must be unobstructed and allow free exit.
2. Eating, drinking or smoking in the laboratory is prohibited.
3. Appropriate personal protective equipment must be worn for each procedure. This includes lab coats, gloves, safety glasses, goggles, and occasionally respirators.
4. Pipetting by mouth is prohibited.
5. All safety signs should be observed and obeyed.
6. All toxic waste must be properly disposed according to RCRA regulations.
7. Flammable, toxic or radioactive material must be stored in approved containers.
8. All containers of chemicals and samples shall be labeled clearly and correctly.
9. All gas cylinders must be firmly secured to prevent falling.
10. All electrical equipment should be properly grounded and electrical cords inspected periodically to ensure that they are in good working condition.

11. Floors and surface working areas are to be kept clean, dry and free from corrosive chemicals. Spills must be cleaned up immediately.
12. Initiation of a laboratory analysis or experiment, not fully described in Standard Methods, AQC Manual or other procedural source, must be preceded by a survey of existing literature. The toxicity and other hazards connected with the reactants and products should be investigated thoroughly before starting any laboratory reaction.

CONTINGENCY PLANS

Contingency plans must be developed and implemented in cases of accidents or emergencies. A spill contingency plan is necessary when toxic or hazardous substances are on site. Personnel must be trained in spill cleanup procedures. Depending on the size of the laboratory and the operations performed in the laboratory, a special team may be needed for emergencies. At smaller installations, the local fire department or emergency response team may be contacted for emergencies. Emergency response teams will require training in respiratory protection, first aid, and spill cleanup. The duties of the team must be clearly defined. Evacuation plans should be distributed, posted and updated yearly.

VENTILATION REQUIREMENTS

Proper ventilation must be provided for analytical procedures and especially those involving the use of toxic substances. Most laboratories will be equipped with fume hoods to provide proper ventilation. Fume hoods must be tested semi-annually to assure proper flow rates and containment. Maintenance must be conducted on a regular basis to insure proper functioning. Exhaust air from glove boxes must be treated by filtration, reaction, absorption, adsorption, electrostatic precipitation or incineration depending on the chemical compounds being used. All exhaust air from primary containment equipment must be discharged by roof-mounted blowers and dispersed clear of occupied buildings and air intakes.

Additionally, a mechanical exhaust ventilation system must be in place to control laboratory room air movement. The air supply must originate from areas where the potential for contamination is low, and exhaust into outside areas.

STORAGE REQUIREMENTS

Proper storage techniques must be followed and are detailed in the following sections.

STORAGE OF COMPRESSED GAS CYLINDERS

Only compressed gas cylinders required for immediate use are allowed to be stored in laboratory work areas. Separate areas should be provided for storage of all other gas cylinders. Empty and full cylinders should not be stored together. Oxygen cylinders must not be stored near flammable gas cylinders. Cylinders of compressed gases must be stored with the valve end up and securely fastened to a wall or immovable object to prevent the cylinder from falling. All cylinders must be securely fastened (strapped or chained) to prevent falls. All cylinders must be kept away from heat sources.

STORAGE OF CHEMICALS

All chemicals or waste materials in the laboratory, stockroom, or bulk storage must be stored according to their chemical compatibility. Storage control will minimize the potential for accidental mixing by spillage, breakage, or fire. Major storage areas are required for the following types of chemical compounds: flammable solvents, corrosive liquids, and strong oxidizers. Additional storage may include areas for radioactive materials, biological hazards, highly toxic materials and compressed gases.

When working in laboratory areas, only the minimum amount of chemical needed for analysis operations should be stored. Separate storage areas (stockrooms) should be provided for the main bulk of chemicals. Incompatible chemicals should either be stored in separate safety storage cabinets, divided by a wall, or enclosed by a tray to prevent accidental mixture. These storage areas and containers should always be properly labeled.

The main storage areas should be divided to accommodate incompatible chemicals. Depending on the amount of chemicals in storage, approved safety storage cabinets can be used. If necessary, storage rooms can also be used.

No more than five one-liter containers of Class I and II materials should be stored in open laboratory areas. Open laboratory areas include reagent shelves and bench

tops. All glass containers must be protected by an outer sheath or made of unbreakable glass.

Storage areas for waste collection should be provided and properly designated. Provisions for containment and separation of incompatible waste materials are also required.

Attachment 2.3

Training Date:
Time:
Conducted By:

4-HOUR LABORATORY SAFETY
TRAINING AGENDA
GREAT LAKES NATIONAL PROGRAM OFFICE
RESEARCH VESSEL PERSONNEL

1. CHEMICAL HEALTH AND SAFETY RESPONSIBILITIES
 - A. Federal Safety and Health Regulations
 - B. EPA Occupational Health and Safety Program
 - C. OSHA 1910.1450 Occupational Exposures to Hazardous Chemicals in the Laboratories.
2. RIGHT TO KNOW
 - A. Chemical Inventory
 - B. Hazard Identification
 - C. MSDS
 - D. Labeling
 - E. Training
3. CONTROLS
 - A. Chemical Handling and Storage
 1. Flammable Materials
 2. Corrosives
 3. Highly Toxic Chemicals

B. Ventilation

C. Personal Protective Equipment

4. SOPs/SAFETY PLANS/EMERGENCY PROCEDURES
5. SPILL CONTROL/HAZARDOUS WASTE

ATTACHMENT 2.4

Training Date:
Time:
Conducted By:

TRAINING AGENDA
FOR
GREAT LAKES NATIONAL PROGRAM OFFICE
RESEARCH VESSEL PERSONNEL

I. Subject

1. GLNPO Chemical Hygiene Plan

- general overview
- use of PPE
- health and safety SOPs for analytical procedures
- MSDS overview

2. Environmental and Health and Safety Procedures

- hazmat/waste transportation
- hazmat storage/spill prevention
- hazardous/common waste
- contingency plan (plan, SCBA, APR, spill cart, instruments, fire, identify team members)

3. General

- MSDS review for specific materials
- safety committee
- lockout/tagout awareness
- general comments

II. Participants

Name - Print

Name - Sign

Date

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Attachment 2.5

MARINE MEDICAL EMERGENCY OPERATIONS PLAN U. S. C. G. Group: Great Lakes

In the event anyone aboard a ship at sea becomes ill or is injured beyond the clear capability of the ship to provide prompt and adequate care, a Medical Emergency (ME) exists and that person should be transferred to a facility providing emergency medical treatment.

If the Captain (or officer in charge) determines that a possible ME exists, the U.S. and/or Canadian Coast Guards should be contacted for advice and assistance. The Coast Guards may be hailed on radio Channel 16 throughout all the Great Lakes. The Coast Guards can provide medical consultation and evaluation of the situation and are equipped for evacuation by boat or helicopter, if needed.

Always contact the Coast Guard for advice. Not all ports have emergency medical facilities and not all may be suitable for a particular ME. These procedures and telephone numbers should be readily available to all employees aboard our research vessels.

2.5.1 Coast Guard Areas

Buffalo

Lake Ontario & East 1/2 of Lake Erie

Coast Guard: (716) 846-4152

Health Services: (716) 846-4167

Trauma Centers: Mercy Hospital, Buffalo, NY
(716) 828-2790
Sisters of Charity, Buffalo, NY
(716) 862-2840

Sault St. Marie

Lake Superior and Upper 1/3 of Lake Huron
and Upper 1/3 of Lake Michigan

Coast Guard: (906)635-3233

Health Services: (906)635-3225

Trauma Centers: Marquette Gen., Marquette,
MI
(800)562-9753

Northern Michigan Regional, Petosky, MI
(616)348-4000

Detroit

West 1/2 of Lake Erie and Lower 2/3 of Lake Huron

Coast Guard: (313) 568-9524

Health Services: (313) 568-9526

Trauma Centers: Detroit Receiving, Detroit, MI
(313) 745-3349
Henry Ford, Detroit, MI
(313) 641-4029

Grand Haven

Eastern 1/2 of Lake Michigan

Coast Guard: (616)847-4501

Health Services: (616)847-4542

Trauma Centers: Ottawa County Hospital
(616)847-5310

Milwaukee
Western 1/2 of Lake Michigan
Coast Guard: (414)747-7181
Health Services: (414)747-7111
Trauma Centers: Froederct General Hospital
(414)259-3000

2.5.2 Great Lakes Regional Hospitals

ILLINOIS Chicago

Northwestern Memorial Hospital
Superior St. & Fairbanks Court
Chicago, IL 60611
(312)908-2000
Ask for Emergency Rm.; 5-10 minutes from harbor.

Columbus Hospital
2520 N. Lakeview Avenue
Chicago, IL 60614
(312)883-7300
5-10 minutes from Lake; unsure of distance
from harbor.

Hammond

St. Margaret Hospital
5454 Hohman Avenue
Hammond, IN 46320
(219)932-2300

Charlevoix

Charlevoix Area Hospital
Lakeshore Drive
Charlevoix, MI 49720
(616)547-0027
1 mile from harbor.

Frankfort

Paul Oliver Memorial Hospital
224 Park Avenue
Frankfort, MI 49635
(616)352-9621
Half mile from harbor.

Zion

American International
Emmaus & Shiloh Boulevard
Zion, IL 60099
(708)872-4561
Unknown distance from harbor. There is more
than one in area

INDIANA Gary

Methodist Hospitals Northwest Indiana
600 Grant Street
Gary, IN 46402
(219)886-4000
20 miles from harbor; 15 minutes.

MICHIGAN Arcadia (See Frankfort)

Escanaba

St. Francis Hospital
3401 Ludington Street
Escanaba, MI 49829
(906)786-3311
2 miles from harbor.

Grand Haven

N. Ottawa Community Hospital
1309 Sheldon Road
Grand Haven, MI 49417
(616)847-5310
2 blocks from harbor.

Harbor Springs (See Petoskey)

Leland (See Frankfort or Traverse City)

Ludington

Memorial Medical Center
One Atkinson Drive
Ludington, MI 49431
(616)845-2390
1 mile from harbor.

Manistique

Schoolcraft Memorial Hospital
500 Main Street
Manistique, MI 49854
(906)341-2163
3 blocks from harbor.

Pentwater (See Ludington)

Petosky

Northern Michigan Hospital
416 Connable Street
Petosky, MI 49770
(616)348-4520
10 miles from harbor.

Portage Lake (See Manistee)

Traverse City

Munson Medical Center
1105 Sixth Street
Traverse City, MI 49684
(616)922-9000
5 minutes from bay

MINNESOTA

Duluth

St. Mary's Emergency Care Trauma Center
407 E. Third Street
Duluth, MN 55805
(218)726-4353

Holland

Holland Community Hospital
602 Michigan Avenue
Holland, MI 49423
(616)394-3202
10-15 minutes from harbor.

Manistee

West Shore Hospital
1465 E. Parkdale
Manistee, MI 49660
(616)723-3501 Ext. 150
5 miles from harbor.

Montague/Whitehall/Muskegon

Hackley Hospital
1700 Clinton Street
Muskegon, MI 49443
(616)726-3511
3 miles from harbor.

Mercy Hospital
1700 Oak Avenue
Muskegon, MI 49442
(616)739-3916
10 miles from harbor.

South Haven

South Haven Community Hospital
955 S. Bailey Avenue
South Haven, MI 49090
(616)637-5271

WISCONSIN

Gill's Rock (See Sturgeon Bay)

Kenosha

Kenosha Hospital
6308 Eighth Avenue
Kenosha, WI 53140
(414)656-2201
5-8 blocks from harbor.

Manitowoc

Holy Family Medical Center
2300 Western Avenue
Manitowoc, WI 54221
(414)684-2011
21 blocks from Lake.

Port Washington

St. Mary's Ozaukee
743 N. Montgomery Street
Port Washington, WI 53074
(414)284-7911

Sheboygan

Sheboygan Memorial Medical
2629 N. 7th Street
Sheboygan, WI 53083
(414)459-5553
5 minutes or less from harbor.

St. Nicholas Hospital
1601 N. Taylor Drive
Sheboygan, WI 53081
(414)459-8300
3-4 min. from harbor

SUPERIOR

Sturgeon Bay

Door County Memorial
330 S. 16th Place
Sturgeon Bay, WI 54235
(414)743-5566
5-10 miles from harbor.

Green Bay

St. Mary's Medical Center
1726 Shawano Avenue
Green Bay, WI 54303
(414)498-4560
1 hour from bay.

Kewaunee

St. Mary's Memorial
First & Lincoln
Kewaunee, WI 54216
(414)388-2210
5 minutes or less from harbor; about 2 miles

Milwaukee

St. Luke's Medical Center
2900 W. Oklahoma Avenue
Milwaukee, WI 53215
(414)649-6000

Racine

St. Mary's Medical Center
3801 Spring Street
Racine, WI 53405
(414)636-4201
5-10 minutes from harbor.

St. Luke's Memorial
1320 Wisconsin Avenue
Racine, WI 53403
(414)636-2201
5-10 minutes from harbor.

Two Rivers

Two Rivers Community Hospital &
Hamilton Memorial Home
2500 Garfield Street
Two Rivers, WI 54241
(414)793-1178 Ext. 125
6 blocks from Coast Guard Station

CANADA
Thunder Bay

Port Arthur General Hospital
460 N. Court St.
Thunder Bay, Ontario P7A4X6
(807)343-6621
5-10 minutes from Marina

Welland Canal

Welland Co. General Hospital
Third Street
Welland, Ontario L3B4W6
(416)732-6111
30 minutes from Lake Ontario

***NOTE: All hospitals listed provide 24-hour Emergency Room Service with a physician on duty.**

Attachment 2.6 POWERED INDUSTRIAL TRUCKS (FORK LIFTS)

RULES OF OPERATION

Safe rules of operation must be followed by all powered industrial truck drivers. The drivers should keep the following rules conveniently located, refer to them frequently, and use them as a checklist for safety. These rules have been developed in accordance with ANSI-B56.1-1983 (Revised).

1. At the beginning of each use, check brakes, steering controls, forks, hoists, warning devices and lights. Report any defects to the supervisor immediately. Also check to see that the fire extinguisher is in place and properly serviced.
2. Always face the direction of travel.
3. Before you start driving, look to see that no person or object is in your path. Always look before backing up.
4. Do not drive over objects lying on the floor such as trash, lumber and pipes. These could damage the truck, shift or topple the load, or flip out and strike another employee.
5. Use low gear when going down ramps or steep grades. On upgrades, keep the load in front. On downgrades, keep the load in back.
6. Under normal traffic conditions, keep to the right.
7. Avoid quick starts or turns, and jerky stops; always come to a complete stop before reversing the direction of travel.
8. Keep a safe distance between vehicles at all times (three truck lengths).
9. Make a complete stop at all doors, corners, exits and stop signs.
10. No horseplay at any time!
11. Keep alert--concentrate on the job at hand.

12. Remember that pedestrians have the right of way at all times.
13. Never drive with wet or greasy hands. If necessary, keep a towel or rag handy at all times.
14. Reduce speed on wet and slippery floors.
15. Whether loaded or empty, carry forks and platforms on lift trucks as low as possible. This lowers the center of gravity and reduces the possibility of overturning the truck or dumping the load. ~
16. Don't run trucks onto elevators unless authorized to do so. Be sure you have sufficient clearance before entering any elevator or going through a doorway. Once the truck is in the elevator, shut off the power, set the brakes and stay in the operator's seat in case of an emergency.
17. Check the clearance of any overhead crane or other object before raising forks or tiering.
18. Never use your truck as an elevator for other employees (for example, to service light fixtures or stock material).
19. When leaving the truck at any time, shut off the power, set the brakes, remove the ignition key, and put the forks or platforms in the down position.
20. Never leave a truck in an aisle. Park the truck to one side, so traffic will not be blocked.
21. Before driving the truck into a freight car or trailer, always secure the bridging plate with bolts or pins so that it cannot move when the power wheels of the truck pass over it; and before moving the truck onto the bridge or into the carrier, walk into the freight car, truck or trailer and check the floor for holes or weak spots (the weight of your truck might break the floor).
22. Keep your feet and legs inside the guard, which is there to protect you.
23. Drive with extreme care, especially during shift changes.

Chapter 3 - COMPLIANCE REVIEW AND STANDARD OPERATING PROCEDURES

3.1 OVERALL POLICY

All construction, safety-related procurements, and safety-related contract activity must be initially reviewed by the Regional Safety Manager or other professionals working under the direction of the Regional Safety Manager. The initial review of activities is designed to assess any issues which may impact the safety, occupational health or environmental compliance of GLNPO employees, contractors, and the general public. Specifically, activities for initial review by the Regional Safety Manager include hazardous waste handling, transportation, and disposal. Supervisors, managers, property control personnel, and procurement personnel have a responsibility to assist the Regional Safety Manager in the maintenance and enforcement of Health and Safety Office review policies.

As such, visiting scientists (non-EPA or EPA contractors) must have health and safety standard operating procedures, spill programs, and training required to implement spill cleanup procedures if necessary.

3.2 SAFETY & HEALTH REVIEW OF NEW CONSTRUCTION/REPAIRS AND ALTERATIONS

All new facility construction activity and significant repairs or alterations to GLNPO facilities must be reviewed by the Regional Safety Manager or other professionals working under his/her direction. The review will be initiated at the planning and design phases and continue throughout construction. The Safety Manager will recommend design changes or design applications relative to safety, occupational health, fire prevention and protection, hazardous waste handling and disposal, and related program areas. As necessary, the Safety Manager may enlist and coordinate the services of specialized experts in such fields as fire protection, engineering, ventilation, hazardous waste, and other related fields. All facility activity impacting life and safety must have the approval of the Regional Safety Manager before it can be initiated.

3.3 SAFETY & HEALTH REVIEWS OF MARINE REPAIRS AND ALTERATIONS

All construction, repairs or alterations to GLNPO vessels, labs or other marine equipment in any way impacting safety, sanitation, occupational health, fire prevention and protection, environmental compliance or related issues must have the approval of the Regional Safety Manager before such activity is begun. The ship operations contractor should immediately report any potential hazards to the project officer, the GLNPO Safety Manager, and the Regional Safety Manager.

3.4 REVIEW OF HAZARDOUS MATERIALS AND HAZARDOUS WASTE DISPOSAL PROCUREMENT

Procurement requests for hazardous materials and hazardous waste disposal at GLNPO facilities must be approved and authorized in written form by the Safety Manager or an individual who has been designated by the Safety Manager. This procedure is necessary due to the complexity of hazardous materials and hazardous waste disposal regulations, as well as potential agency liability. Standard Operating Procedures for Hazardous Materials and Hazardous Waste Disposal may be found as an Attachment to the Chemical Hygiene Plan found in Appendix J of this manual.

3.5 HEALTH AND SAFETY REVIEW OF CONTRACTS

Any contract which involves field or laboratory work or otherwise appears to impact health and safety must be reviewed and approved by the Regional Safety Manager while in the initial planning stage. All EPA contracts must contain provisions which require the contract employee to follow all safety, health, and environmental compliance rules and regulations. If necessary, applicability of compliance rules and regulations will be determined by the Regional Health and Safety Manager.

3.6 REVIEW OF MISCELLANEOUS PROCUREMENT IMPACTING SAFETY, HEALTH OR ENVIRONMENTAL COMPLIANCE

Any procurement issue which has not been addressed in this manual, but appears to impact safety, health, hazardous material, or hazardous waste handling and disposal, should be brought to the attention of the Regional Safety Manager. The Regional Safety Manager will then determine what action, if any, needs to be taken.

3.7 STANDARD OPERATING PROCEDURE POLICY

Written Health and Safety Standard Operating Procedures (SOPs) must be developed for specific tasks (eg. pesticide inspections, PCB inspections, RCRA permit inspection, RCRA enforcement of TSDs, etc.) related to field or laboratory operations. Within these SOPs, all safety, occupational health and environmental compliance (hazardous waste transport and disposal) issues should be addressed. Division or Office management is responsible for the development of safety SOPs. The SOPs should be reviewed by the appropriate Division or Office Safety Representative. All SOPs should be readily available for examination by the Regional Safety Manager during regularly scheduled inspections or surveys.

Health and Safety SOPs may address issues such as Safety Procedures, personal protective equipment, training requirements (formal and on-the-job), medical monitoring and respirator fit testing requirements. Special requirements, such as specific types of respirators and confined space entry procedures, may also be addressed. If appropriate, Regional SOPs may be used to supplement laboratory or field SOPs.

3.8 FIELD SOPs

Standard operating procedures for GLNPO field operations, primarily sediment sampling, are described in **Chapter 10** of this manual.

3.9 LABORATORY CHEMICAL HYGIENE SOPs

Laboratory Chemical Hygiene SOP's on board GLNPO research vessels are described in **Appendix L** of this manual.

3.10 MARINE SOPs

All marine sampling, recovery, and operational activities are required to have SOPs for specific activities which impact safety, health, or environmental compliance.

3.11 EVACUATION PLAN

All GLNPO personnel must participate in building evacuation training exercises and drills. They are also expected to be familiar with operational procedures identified in each Occupant Emergency Evacuation Plan for their place of work. GLNPO personnel are expected to cooperate fully with the instructions provided. An Occupant Evacuation Plan is described in **Appendix M** of this manual.

Chapter 4 - ANNUAL AND PERIODIC INSPECTIONS AND SURVEYS

4.1 STANDARDS/COMPREHENSIVE PROGRAM

For all inspections or surveys conducted in Region V, standards and regulations will apply in the following order of importance:

- 1) EPA regulations in CFR form or as EPA Orders or regulations
- 2) OSHA regulations contained in various CFRs (e.g. 29 CFR 1910, 29 CFR 1926)
- 3) All applicable laws and regulations including those from Department of Transportation, the Coast Guard, state and local environmental laws and regulations, in addition to consensus programs such as the National Fire Protection Association and the American National Standards Institute

All appropriate standards and regulations will be used to assess and evaluate hazardous conditions during inspections. If a conflict exists in the application of various standards and regulations, the Regional Health and Safety Manager will determine which standard or regulation applies based on professional judgment and risk assessment techniques.

A summary of required inspections, frequency of inspections, and personnel responsible for specific inspections can be found in the table below.

SAFETY INSPECTIONS AND SURVEYS REQUIRED OF GLNPO

<u>PERIOD</u>	<u>INSPECTOR</u>	<u>TITLE</u>
Weekly	Facility Safety Officer	General Safety Inspection
Weekly	Ship Operations Contractor	Drinking Water Inspections
Weekly	Ship Operations Contractor	Hazardous Waste Storage Area Inspections
Monthly	Lab Safety Officer	Laboratory Eyewash and Safety Shower Inspection

<u>PERIOD</u>	<u>INSPECTOR</u>	<u>TITLE</u>
Monthly	Ship Operations Contractor	Ship Fire Alarms
Monthly	Facility Safety Officer and Ship Operations Contractor	Fire Extinguisher & Fire Hydrant Inspections
Monthly	Ship Operations Contractor	SCBA Inspections
Monthly	Ship Operations Contractor	Life Safety Equipment Inspections
Semi-annual	EPA Staff	Safety and Health and Environmental Compliance Surveys
Semi-annual	Outside Contractor	Ship Fire Alarms
Semi-annual	Ship Chemical Hygiene Officer	Laboratory Hood Inspections
Annual	EPA Industrial Hygiene Consultant	Industrial Hygiene Surveys
Annual	EPA Staff/Consultant	Environmental Compliance Audit
Annual	Ship Operations Contractor	Crane and Rigging Inspections
Annual	Naval Hospital Great Lakes, IL	Occupational Health Inspection
Annual	Naval Hospital Great Lakes, IL	Preventive Medicine Inspection
Annual	Naval Hospital Great Lakes, IL	Sanitation (and refrigeration) Inspection
5 Year	Outside Contractor	Hull Inspection
Prior to each tour	Ship Operations Contractor	Open House Public Safety Checklist

4.2 SEMI-ANNUAL SAFETY, HEALTH, AND ENVIRONMENTAL COMPLIANCE SURVEYS

As required by EPA Order 1440, all Region V GLNPO facilities, spaces, vehicles, vessels, and equipment will be inspected or evaluated by the Regional Health and Safety Manager. The purpose of these inspections is to assess, evaluate and reduce hazards, as well as to ensure the effectiveness of Safety Programs throughout GLNPO.

All inspections will be followed by a written Safety Inspection Deficiency Notice Report, stating the location of the inspection (division, branch, type of occupancy, and so on), the hazards observed, the applicable regulations or standards, the risk assessment of the hazard (serious, non-serious, etc.), and the necessary corrective measure(s).

A cover letter to the Division or Office Director will accompany the report and will require a first abatement report to be submitted within 45 days with subsequent reports every 45 days until all deficiencies are corrected or abated. All abatement or hazard correction reports should be sent to the Regional Health & Safety Manager.

4.3 ANNUAL INDUSTRIAL HYGIENE SURVEYS

Yearly Industrial Hygiene Surveys are required for all EPA laboratory facilities. The purpose of these surveys is to evaluate and reduce occupational health hazards in Regional laboratories and to evaluate the overall Occupational Health Program in these laboratories. These surveys will be conducted by a qualified Industrial Hygienist under the overall direction of the Regional Health and Safety Manager. Survey reports will be sent to the Division or Office Director. A cover letter containing comments relative to the overall Occupational Health Program of the facility will be attached to the survey. In addition, the cover letter will provide recommended abatement procedures.

4.4 ANNUAL ENVIRONMENTAL COMPLIANCE AUDITS

Regional Environmental Compliance Audits will be conducted as part of the Annual Regional Safety Inspection. Environmental compliance findings, such as the use, transportation, and disposal of hazardous waste, will be included in the Safety Inspection Deficiency Notice Report. Environmental compliance findings

will be labeled to distinguish them from safety findings.

4.5 SPECIAL STUDIES

Special studies relating to safety, occupational health or environmental compliance issues are conducted yearly at the discretion of the Regional Health & Safety Manager. Most of these studies involve occupational health issues such as indoor air quality or use of rare or unusual chemicals and are issues cited by management or employees in a specific work area. Under the direction of the Regional Health & Safety Manager, all special studies are conducted by qualified professionals in the subject being studied (e.g. Industrial Hygienist, Environmental Protection Specialist, etc.). Results of the studies will be shared with all concerned employees and management. If abatement procedures are required, the Regional Safety Manager will coordinate such activities with the division or office concerned.

4.6 DEFICIENCY ABATEMENT PROCEDURES AND TRACKING

All deficiencies or hazards noted in a Semi-annual Inspection Report must be followed by subsequent reports every 45 days from receipt of the initial report until all deficiencies are corrected or abated. Each abatement report from the Division or Office Director need only refer to those deficiencies or hazards which were detailed in the previous abatement report.

Once deficiencies are reported to the Regional Health and Safety Manager in an abatement report from a division or office, each individual deficiency or hazard, its cost, expected time of abatement and other related factors are tracked by an automated Deficiency or Hazard Abatement System. This tracking system will generate a letter to the appropriate division or office every 45 days if Abatement Reports are not received. This system will also enable the Regional Health and Safety Manager to inform senior management of abatement status and percentage of hazards abated and other related factors relative to a given division, office or the Region overall.

4.7 FIRE PROTECTION SYSTEMS STANDARD OPERATING PROCEDURES

To ensure that GLNPO research vessel fire protection systems are ready for use at all times and that all equipment provided is properly maintained, fire protection

systems standard operating procedures must be developed and implemented. A standard checklist must be completed for each inspection and the checklist must be signed by the inspector.

The following areas are included in **Attachment 4.1** and must be inspected in accordance with all regulatory and Standard requirements, including NFPA Standards and 46 CFR Part 189:

- Fire Detection And Alarm System
- Fire Alarm Check List
- Monthly Fire Extinguisher Inspection Check List
- Weekly Fire Extinguisher Inspection Check List
- Container Lab Extinguishing Systems
- Galley Extinguishing Systems
- Emergency Lighting Systems
- Fire Pumps, Main Hose, Hose Stations
- Engine Room Carbon Dioxide System

4.8 SHIP FIRE ALARMS/SEMI-ANNUAL INSPECTIONS BY OUTSIDE CONTRACTOR AND MONTHLY INSPECTIONS BY SHIP OPERATIONS CONTRACTOR

Comprehensive inspections of GLNPO research vessel fire alarm systems will be performed semi-annually by qualified contractor(s). The contractor(s) must be approved by the Regional Safety Manager prior to inspection activities. In addition to semi-annual inspections, comprehensive inspections will be performed on a monthly basis by the ship operations contractor.

Semi-annual and monthly fire alarm inspection procedures are located in **Attachment 4.1.1** of this chapter. A comprehensive fire alarm checklist for the R/V *Lake Guardian*, to be used by the inspector, is located in **Attachment 4.1.10** of this chapter.

All records of inspection must be maintained on board each vessel inspected. Copies of the records must also be maintained at GLNPO headquarters.

4.9 MONTHLY FIRE EXTINGUISHER AND FIRE HYDRANT INSPECTIONS

4.9.1 Inspection: Extinguishers will be inspected when first placed into service and

inspected at 30-day intervals thereafter. Sometimes, extinguishers will be inspected more frequently as situations and circumstances warrant. The inspection procedure for monthly fire extinguisher inspections is found in **Attachment 4.1.3** of this chapter. NOTE: In addition to the required monthly fire extinguisher inspections, weekly fire extinguisher inspections will be performed by the ship operating contractor. A weekly inspection checklist is also found in **Attachment 4.1.4** of this chapter.

4.9.2 Corrective Action: When inspection of an extinguisher indicates a deficiency listed on the inspection checklist, immediate corrective action will be taken.

4.9.3 Rechargeable Extinguishers: When inspection of a rechargeable extinguisher indicates a deficiency listed on the checklist, appropriate maintenance procedures will be immediately taken.

4.9.4 Non-rechargeable Dry Chemical Extinguisher: When inspection of a non-rechargeable dry chemical extinguisher indicates a deficiency among the checklist items, it will be discharged and removed from service.

4.9.5 Recordkeeping: Records will include the following: the date of inspection, the inspectors name, and any deficiencies noted. Inspectors will remove deficient fire extinguishers from service until repairs are made. Temporary replacement extinguishers must be used to provide continuous protection.

4.10 ANNUAL AND PERIODIC CRANE AND RIGGING INSPECTIONS

Annual inspections are required for all derricks, cranes, hoists or rigging. Inspections will be performed in accordance with OSHA 29 CFR 1910.179-181 by an outside certified contractor.

4.11 PERIODIC INSPECTIONS OF EYEWASH AND SAFETY SHOWERS

Weekly inspections will be performed to ensure the proper working condition of eyewash stations and safety showers. Eyewash stations and showers must be maintained in accordance with ANSI Z 358.1. A weekly inspection checklist appears as **Attachment 4.2** of this chapter. Please see **Appendix N, SSI Occupational and Safety Health Program Manual** for SOPs for inspections of eyewash and safety showers.

4.12 ANNUAL AND PERIODIC OCCUPATIONAL HEALTH/PREVENTIVE MEDICINE/SANITATION INSPECTIONS

Annual and periodic occupational health, preventive medicine, and sanitation inspections will be coordinated by designated personnel. This inspection will be performed by the U.S. Navy or qualified equivalent. In addition, periodic food service inspections must be performed in accordance with the standard operating procedures specified in the Standard Operating Procedures for Vessel Sanitation (Attachment 4.3 of this chapter). The Food Service Inspection Checklist, Attachment 4.4 of this chapter, should also be completed. Certificates of Acceptance for the annual and periodic inspections should be kept on board GLNPO research vessels and copies should be provided to GLNPO headquarters.

4.13 LIFE SAFETY EQUIPMENT INSPECTIONS

Inspections of all life safety equipment, such as life rafts and escape equipment, on board GLNPO research vessels will be inspected monthly by the ship operations contractor. The inspections are designed to ensure safe operation of all life safety equipment in the event of an emergency. A drawing, showing the locations of escape equipment, has been posted in the galley, and within the passageways to both labs; see Attachment 4.1.11 of this chapter.

Records of inspection must be maintained on board each research vessel and at GLNPO headquarters.

4.14 SEMI-ANNUAL LABORATORY HOOD INSPECTIONS AND REPORTS

The general industry standard for laboratory hood face velocities is 100 cubic feet per minute (cfm). GLNPO research vessels' fume hoods must be tested for adequate face velocity on a semi-annual basis by the ship's Chemical Hygiene Officer. An evaluation form appears as Attachment 4.5 of this chapter. Copies of the semi-annual laboratory hood inspection and report must be sent to EPA headquarters in Washington, D.C.

4.15 DRINKING WATER INSPECTIONS

Inspections of potable drinking water systems on board GLNPO research vessels will be performed in accordance with all regulatory and policy requirements. The

inspections will be performed by the ship's operations contractor.

EPA policy requires that EPA facilities monitor drinking water for lead and take appropriate action if lead levels are at or above the action level. GLNPO complies with this policy through monitoring of shipboard drinking fountains and sink faucets that are used as sources of drinking water. Monitoring for lead will be performed annually for operating vessels.

If a research vessel contains a potable water supply, monitoring for coliform will be conducted by the ship operations contractor. Frequency of testing will be either daily or weekly based on the testing location.

Copies of all inspection records will be maintained on board each vessel inspected and at GLNPO headquarters.

4.16 MONTHLY SCBA INSPECTIONS

In case of emergency, a self-contained breathing apparatus (SCBA) is used as respiratory protection in hazardous or oxygen-deficient atmospheres. Monthly inspections must be conducted to ensure the readiness of the SCBA. A generic inspection checklist appears as **Attachment 4.6** of this chapter.

4.17 WEEKLY HAZARDOUS WASTE STORAGE AREA INSPECTIONS

Inspections of hazardous waste storage areas will be conducted on a weekly basis. This inspection will confirm that hazardous wastes are stored in segregated areas and in leak-free, properly-labeled containers with no evidence of spillage. Improper storage or extended accumulation dates will be immediately noted and corrected. The Weekly Hazardous Waste Storage Area Inspection Sheet and Spill Cart Inspection Form appear as **Attachments 4.7 & 4.8** of this chapter.

4.18 EMERGENCY SUPPLIES AND EQUIPMENT INSPECTIONS/RCRA REQUIREMENTS

The Chemical Hygiene Officer is responsible for ensuring that inspections of all emergency supplies and equipment are performed in accordance with applicable RCRA generator requirements. Also, as required by RCRA, locations of shipboard emergency supplies and equipment will be posted throughout all operational areas

where hazardous wastes are generated and stored.

4.19 HULL INSPECTIONS (5-YEAR DRY DOCK REQUIRED BY U.S. COAST GUARD)

All US EPA research vessels must comply with the US Coast Guard and the American Bureau of Shipping five-year dry-docking and overhaul inspection requirements. Inspection Specifications are included in **Attachment 4.9** of this Chapter; "Specifications for Dry-Docking and Overhaul Inspection".

4.20 SAFETY CHECKLIST FOR IN-PORT OPEN HOUSES

Prior to in-port open house activities, the ship operations contractor must ensure that the ship is safe and secure for visitors by completing the "Pre-Open House Checklist" The checklist is explained in more detail in **Chapter 8** of this manual.

4.21 SANITATION AND FOOD HANDLING INSPECTIONS

Sanitation and refrigeration inspections will be conducted annually. Sanitation standard operating procedures appear as **Attachment 4.3** of this chapter and a food handling inspection form appears as **Attachment 4.4**. Copies of current sanitation and food handling inspection reports for GLNPO research vessels are located in **Appendix Q** of this manual.

4.22 DOCUMENTATION

All inspection records that are completed for GLNPO research vessels must be filed on board each vessel inspected. Copies of all inspection records must also be provided to the GLNPO headquarters central file.

Attachment 4.1 FIRE PROTECTION SYSTEMS - STANDARD OPERATING PROCEDURES

1.0 SCOPE

These Standard Operating Procedures contain the necessary information for the testing and inspection of all vessel fire protection systems. It is intended to ensure that the systems will be ready for use at all times and that all equipment provided is maintained and replaced after each use or needed repairs. The procedure requires that a checklist be completed for each inspection. The checklists detail the extent of the inspection made and must be signed, upon completion, by the person performing the inspection. These checklists will serve as a record of the testing performed on the fire protection systems.

2.0 REFERENCES

The recommended procedures for the testing of the various fire protection systems have been taken from the USCG regulations and NFPA Standards. The criteria applicable to fire protection systems has been developed from the following:

46 CFR Part 189 - Oceanographic and Research Vessels

NFPA Standards - NFPA 10 - Fire extinguishers, Portable

NFPA 20 - Fire Pumps, Centrifugal

NFPA 14A - Standpipe and Hose Systems, Inspection,
Testing and Maintenance

NFPA 12 - Carbon Dioxide Extinguishing Systems

NFPA 17A - Wet Chemical Extinguishing Systems

NFPA 17 - Dry Chemical Extinguishing Systems

NFPA 72H - Testing Procedures for Local, Auxiliary,
Remote Station, and Proprietary Protective Signaling
Systems

NFPA 101 - Life Safety Code (Emergency Lighting)

3.0 RESPONSIBILITIES AND AUTHORITY

It is the duty of the Captain, or person designated by the Captain, to ensure that fire fighting equipment aboard an EPA research vessel is ready for use at all times and that such equipment is provided, maintained, and replaced after use in accordance with proper procedure. No changes or repairs can be made to any fire protection system without the Captain's knowledge and consent. All fire protection equipment must be 100% operational before the vessel will be permitted to leave the dock. When repairs or modifications are made to any fire protection system, and the system cannot be returned to full operational status, the condition shall be so noted and explained in the vessel's log book. Interim compensatory measures, such as a roving fire watch or additional portable extinguishers, shall be provided, at the Captain's discretion, until the system can be fully repaired.

4.0 EQUIPMENT REQUIRED

Most of the required tests and inspections can be performed with ordinary tools and equipment available on board the vessel. Where some pieces of specialized hardware is required, it is listed in the specific procedure for the system being inspected.

5.0 PROCEDURE

This procedure contains the written instructions for the testing and maintenance of the vessel's fire protection systems. Each system is provided with separate instructions and checklists. The frequency of the inspections is noted within each procedure. Typically, a monthly and annual or semi-annual inspection is required. The attached comprehensive Fire Inspection Standard Operating Procedures have been developed and should be completed as indicated by qualified fire inspectors.

Attachment 4.1.1 FIRE DETECTION AND ALARM SYSTEM

Procedure - Monthly

The fire detection systems shall be inspected monthly, or at approximately 30-day intervals. Extension of the schedule up to one week is permitted in unusual circumstances. The inspection should include the following:

- 1) The green "Power "On" indicator lamp should be illuminated.
- 2) The control panel lamp test switch should be depressed to verify that all lamps are functional.
- 3) No yellow trouble lamps or red alarm lamps should be illuminated.
- 4) The battery trouble lamp should not be illuminated.
- 5) The voltage meter should be above 24 volts.
- 6) No obvious damage, disconnected wires, or altered circuits should be evident.
- 7) One device should be randomly activated to ensure that the system is functional and the alarms are audible throughout the vessel.

When any deficient condition is found, it shall be listed on the checklist, and steps taken to correct the deficiency. The person performing the inspection should then complete, sign, and date the attached checklist.

Procedure - Semi-annually

The Fire Detection and Alarm system must be inspected and serviced by a qualified service technician. The inspection should include those items specified by NFPA 72H.

CHECKLIST - FIRE DETECTION AND ALARM SYSTEMS

Location Bridge_____

 Lab 1A_____

 Lab 2A_____

 Lab 3A_____

 Lab 4A_____

The green "Power On" indicator lamp is illuminated_____

Lamp test shows that all lamps are functional_____

No yellow trouble or red alarm lamps are illuminated_____

The battery trouble lamp is not illuminated_____

The voltage meter reads above 24 volts_____

No obvious damage, disconnected wires, or altered circuits_____

Location and type of device tested_____

All alarms audible_____

Comments_____

Inspected By

Date

Attachment 1.2 FIRE ALARM CHECK LIST

A semi-annual test of the fire alarm system aboard all GLNPO vessels is required.

One sixth of all smoke detectors must be inspected monthly. Each monthly inspection will comprise a different group of detectors ensuring that each detector is inspected semi-annually.

The fire alarm checklist must include the following items:

- All smoke detectors must be identified by location.
- All pull stations must be identified by location.
- All heat detectors must be identified by location.
- Carbon dioxide pressure switches (usually found in engine rooms) must be identified by location.

Comments and discrepancies must be addressed at the end of the checklist and the inspector's signature and date of inspection must appear on the form.

ATTACHMENT 4.1.3

Inspection will be performed in accordance with NFPA Standard No. 10.

MONTHLY INSPECTION CHECKLIST
FOR
FIRE EXTINGUISHERS

Date _____

Fire Extinguisher Number (#) _____

- | Y | N | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Located in designated place. |
| <input type="checkbox"/> | <input type="checkbox"/> | No obstruction to access or visibility. |
| <input type="checkbox"/> | <input type="checkbox"/> | Operating instructions on nameplate legible and facing outward. |
| <input type="checkbox"/> | <input type="checkbox"/> | Seals and tamper indicators not broken or missing. |
| <input type="checkbox"/> | <input type="checkbox"/> | Determine fullness by weighing or "hefting". |
| <input type="checkbox"/> | <input type="checkbox"/> | Examine for obvious physical damage, corrosion, leakage, or clogged nozzle. |
| <input type="checkbox"/> | <input type="checkbox"/> | Pressure gauge reading or indicator in the operable range or position. |

Comments/Discrepancies _____

Signature: _____

Date: _____

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Station	✓ If OK	Comments	Action Taken If Needed	Location	Initial
1				Bridge (Aft= towards stern)	
2				Bridge (Fwd= towards bow)	
3				Outside AFT Doghouse	
4				O-1 Level FWD Passageway	
5				O-1 Level AFT Passageway	
6				O-1 Level Outside AFT Bulkhead	
7				Mess Deck Fwd	
8				Galley	
9				Main Deck Outside Crew Qtrs	
10				Main Passageway Outside Chem Lab	
11				Inside Chem Lab Starboard Wall FWD	
12				Inside Chem Lab Starboard Wall AFT	
13				Biology Lab Port Wall FWD	
14				Biology Lab Port Wall AFT	
15				Multi Purpose Lab Starboard Side	
16				Multi Purpose Lab Port Side	
17				Rear of Bow Thruster	
18				Outside M&D Room Portside Lower Pass.	
19				Outside Aux Machine Room Portside Pass.	
20				Machine Shop FWD of Lathe	
21				Machine Shop AFT Bulkhead	
22				Engine Room FWD At Entrance	
23				Engine Room Starboard Side	
24				Exercise Rm. Starboard Side	
25				Eng. Rm. Port Side Aft	
26				O-1 Level Outside Aft	

Attachment 1.5 - CONTAINER LAB EXTINGUISHING SYSTEMS

Procedure - Monthly

The Container lab fire extinguishing systems shall be inspected monthly, or at approximately 30-day intervals. Extension of the schedule up to one week is permitted in unusual circumstances. The inspection should include the following:

- 1) Cylinder should be securely fastened to the bulkhead.
- 2) Manual release and nozzles should be unobstructed.
- 3) Tamper indicators and seals should be intact.
- 4) No obvious physical damage should be present.
- 5) Pressure gauge should be in the operable range.

When any deficiency is found, it shall be noted on the checklist, and steps shall be taken to correct the condition. The person performing the inspection should complete, sign, and date the attached checklist.

Procedure - Annually

The lab extinguishing system must be inspected and serviced by a qualified technician. The inspection should include those items specified by NFPA 17.

CHECKLIST - CONTAINER LAB EXTINGUISHING SYSTEMS

Location Lab 1A_____

 Lab 2A_____

 Lab 3A_____

 Lab 4A_____

The cylinder is in place and securely fastened to the bulkhead_____

The manual release station and the nozzles are unobstructed_____

The tamper indicators and seals are intact_____

There is no obvious physical damage or corrosion_____

The pressure gauge is in the operable range_____

Comments_____

Inspected By_____ Date_____

Attachment 1.6 - GALLEY EXTINGUISHING SYSTEM

Procedure - Monthly

The galley fire extinguishing system shall be inspected monthly, or at approximately 30-day intervals. Extension of the schedule up to one week is permitted in unusual circumstances. The inspection should include the following:

- 1) Red lever in the control head should be horizontal with the pin in place, and the system indicator positioned in the "set", not the "released", position.
- 2) Manual release should be unobstructed with the pin in place.
- 3) Cylinder pressure gauge should be in the green operable range.
- 4) There should be two nozzles on the piping above the range with blowoff caps in place.
- 5) There should be no visible signs of damage to the system, and the cylinder and piping should be securely fastened to the bulkhead.
- 6) The fusible link should be in place in the hood above the range.

When any deficient condition is found, it shall be noted on the checklist, and steps shall be taken to correct the deficiency. The person performing the inspection should complete, sign, and date the attached checklist.

Procedure - Annually

The galley extinguishing system must be inspected and serviced by a qualified service technician. The inspection should include those items specified by NFPA 17A.

CHECKLIST - GALLEY EXTINGUISHING SYSTEM

The red lever on the control head is horizontal with the pin in place_____

The system indicator is in the "set" position, not the "released " position_____

The manual release is unobstructed with the pin in place_____

The cylinder pressure gauge is in the green operable zone_____

There are two nozzles on the piping above the range_____

Blowoff caps are in place_____

There are no visible signs of damage to the cylinder and piping and they are securely fastened to the bulkhead_____

The fusible link is in place in the hood above the range_____

Comments_____

Inspected By_____ Date_____

Attachment 1.7 - EMERGENCY LIGHTING

Procedure - Monthly

The emergency lighting units shall be inspected monthly, or at approximately 30-day intervals. Extension of the schedule up to one week is permitted in unusual circumstances. The inspection should include the following:

- 1) The test switch should be depressed for at least 30 seconds. The lamps shall illuminate, and the charge indicator shall momentarily indicate rapid charge.
- 2) The lamps shall be aimed to illuminate the exit path.

When any deficient condition is found, it shall be listed on the checklist, and steps shall be taken to correct the deficiency. The person performing the inspection should complete, sign, and date the attached checklist.

Procedure - Annually

On an annual basis, each lighting unit should be tested by performing a deep cycle discharge test by unplugging the unit. If the unit is deemed functional, it will be re-energized. The lamps shall remain illuminated for a period of 1-1/2 hours. If the lamps do not remain illuminated for the full 90 minutes, the batteries shall be replaced.

This annual testing procedure will also serve as the monthly inspection for that particular month.

CHECKLIST - EMERGENCY LIGHTING

Test Period Monthly_____ Annual_____

Location Test Switch Charge Indicator Aim Correct Deep Cycle

Inspected By_____ Date_____

Attachment 1.8 - FIRE PUMPS, MAIN HOSE, HOSE STATIONS

Procedure - Weekly

The fire pumps, fire main, and hose stations shall be inspected weekly. Extension of the schedule up to one week is permitted in unusual circumstances. The following should be checked:

- 1) Test each fire pump on a staggered basis. Start the pump and operate on recirculation or allow to flow through a convenient outlet. Operate the pump for at least 10 minutes and check for abnormal conditions such as noise, vibration or leakage.
- 2) Visually observe each valve on the fire main and verify that the valves are sealed in the open position.
- 3) Inspect each fire hose and verify that:
 - The gate valve is closed
 - The valve handle is present
 - The hose and nozzle each have a gasket in place
 - The hose is present and not damaged or mildewed
 - A spanner wrench is present
 - The nozzle is present and the open/shut handle operates freely.
 - There are no visible signs of leakage.

When any deficient condition is found, it shall be listed on the checklist, and steps shall be taken to correct the deficiency. The person performing the inspection should complete, sign, and date the attached checklist.

Procedure - Annually

- 1) At least annually, the electric fire pump and the diesel fire pump shall be flowed to determine if each is capable of flowing 100 gpm at the two highest outlets at a nozzle pressure of 50 psi. Single 50 foot lengths of hose and 1/2 inch diameter nozzles should be used.
- 2) At least annually, each length of fire hose should be hydrostatically

tested to the maximum pressure it is subjected to but not less than 100 psi.

- 3) At least annually, the fire main should be flushed by flowing each outlet for at least five minutes or until clean water appears.
- 4) At least annually, each valve in the fire main should be cycled through a complete open-close cycle. The valves should be returned to their correct position.

CHECKLIST

FIRE PUMPS

Pump Tested:

Electric Fire Pump_____

Diesel Fire Pump_____

Bilge Pump_____

Start Time _____ Stop Time _____ Pressure at gauge _____

Started from engine room _____ Bridge _____

Noise/Vibration/Leakage _____

Comments _____

Inspected By _____ Date _____

FIRE MAIN

Electric fire pump sea chest valve open and locked _____

Electric fire pump discharge valve open and locked _____

Electric bilge pump discharge valve closed _____

Fire main isolation valve at forward bulkhead open and locked _____

Diesel fire pump at sea chest valve open and locked _____

Diesel fire pump discharge valve open and locked _____

Comments _____

Inspected By _____ Date _____

FIRE HOSE STATIONS

Hose Station Number 1 2 3 4 5 6 7 8 9 10 11 12

1) Gate valve closed_____

2) Gate valve handle present_____

3. Two gaskets present and in good condition_____

4) Hose in good condition_____

5) Spanner Wrench Present_____

6) Nozzle present; handle free_____

7) No visible leakage_____

Comments:

Inspected By_____Date_____

Attachment 1.9 - ENGINE ROOM CARBON DIOXIDE EXTINGUISHING SYSTEM

Procedure - Monthly

The engine room carbon dioxide system shall be inspected monthly, or at approximately 30-day intervals. Extension of the schedule up to one week is permitted in unusual circumstances. The inspection should include the following:

- 1) Six cylinders should be present, connected to the manifold, and securely mounted.
- 2) There should be two control cylinders, two control valves, and discharge delay that are sealed in position with locking pins and tamper indicators.
- 3) The two system release handles are in place, with "Break Glass" and operating instructions present; two brass hammers present.
- 4) The manual pull cables and conduits between the releases are in good operating condition and are connected to the valve operators.
- 5) The two emergency air breathing apparatus are in the engine room and their gauges are in the operable range.
- 6) Four system nozzles in the engine room are not damaged, clogged or obstructed.

When any deficient condition is found, it shall be noted on the checklist, and steps shall be taken to correct the deficiency. The person performing the inspection should complete, sign and date the attached checklist.

Procedure - Annually

The engine room carbon dioxide system must be inspected and serviced by a qualified technician. The inspection should include those items specified by NFPA 12. The inspection should include a weight check of the cylinders. The cylinders should be recharged if a weight loss of more than 10% of the marked agent weight occurs.

CHECKLIST - ENGINE ROOM CARBON DIOXIDE SYSTEM

Six cylinders are present, connected to the manifold, and securely mounted_____

No visible signs of damage_____

Two control cylinders, two control valves, and one discharge delay are sealed in position with locking pins and tamper indicators_____

Two system release handles are in place, with "Break Glass" and operating instructions present_____

Two brass hammers present_____

The manual pull cables and their conduits from the releases to the valve operators are connected_____

No visible sign of damage_____

Two emergency air breathing apparatus are located in the engine room_____

Their pressure gauges are in operable range_____

Four system nozzles in the engine room are not damaged, clogged or obstructed_____

Comments_____

Inspected By_____ Date_____

Attachment 1.10 - R/V LAKE GUARDIAN FIRE ALARM CHECK LIST

A semi-annual test of the fire alarm system is required.

One sixth of all smoke detectors must be inspected monthly. Each monthly inspection will comprise a different group of detectors insuring that each detector is inspected semi-annually.

- 1 smoke detector for the navigating bridge (Pilot House)

- 16 smoke detectors located on the 01 deck as follows:

Y	N	
<input type="checkbox"/>	<input type="checkbox"/>	Room 201
<input type="checkbox"/>	<input type="checkbox"/>	Room 202
<input type="checkbox"/>	<input type="checkbox"/>	Room 203
<input type="checkbox"/>	<input type="checkbox"/>	Room 204
<input type="checkbox"/>	<input type="checkbox"/>	Forward passageway
<input type="checkbox"/>	<input type="checkbox"/>	Room 207
<input type="checkbox"/>	<input type="checkbox"/>	Room 208
<input type="checkbox"/>	<input type="checkbox"/>	Room 209
<input type="checkbox"/>	<input type="checkbox"/>	Room 210
<input type="checkbox"/>	<input type="checkbox"/>	Room 211
<input type="checkbox"/>	<input type="checkbox"/>	Room 212
<input type="checkbox"/>	<input type="checkbox"/>	After passageway
<input type="checkbox"/>	<input type="checkbox"/>	Room 213
<input type="checkbox"/>	<input type="checkbox"/>	Room 214
<input type="checkbox"/>	<input type="checkbox"/>	Room 215
<input type="checkbox"/>	<input type="checkbox"/>	Room 216

- 8 smoke detectors on the main deck as follows:

Y	N	
<input type="checkbox"/>	<input type="checkbox"/>	Crew's Lounge
<input type="checkbox"/>	<input type="checkbox"/>	Galley
<input type="checkbox"/>	<input type="checkbox"/>	Forward passageway
<input type="checkbox"/>	<input type="checkbox"/>	After passageway
<input type="checkbox"/>	<input type="checkbox"/>	Chem Lab
<input type="checkbox"/>	<input type="checkbox"/>	Bio Lab
<input type="checkbox"/>	<input type="checkbox"/>	Room 111
<input type="checkbox"/>	<input type="checkbox"/>	Wet Lab - 1
<input type="checkbox"/>	<input type="checkbox"/>	Rm. 3 SCI (Forward of Bio-Lab)
<input type="checkbox"/>	<input type="checkbox"/>	Crews Rm (Forward of Lab Office)

Y N

- ☐ ☐ • Organic Extraction Laboratory - 2 smoke detectors, 1 manual pull station
- ☐ ☐ • Organic Analytical Laboratory - 2 smoke detectors, 1 manual pull station
- ☐ ☐ • Primary Productivity Lab - 2 smoke detectors, 1 manual pull station
- ☐ ☐ • Hazmat Van - 3 smoke detectors, 1 manual pull station
- ☐ ☐ • 1 smoke detector for the storage room(by the exercise room)
- ☐ ☐ • 1 smoke detector for the exercise room
- ☐ ☐ • 2 heat detectors for the port and starboard exhaust uptakes
- ☐ ☐ • 1 heat detector for the bow thruster compartment
- ☐ ☐ • 1 smoke detector for the MSD compartment
- ☐ ☐ • 1 heat detector for the engineer's shop
- ☐ ☐ • 1 heat detector for the auxiliary machinery compartment
- ☐ ☐ • 1 heat detector for the engine room
- ☐ ☐ • 1 heat detector for the forward engine room passageway
- ☐ ☐ • 1 heat detector for the engine room aft passageway
- ☐ ☐ • Carbon dioxide system pressure switch for the engine room

Comments/Discrepancies

Signature

Date

SECTION: CHAPTER 4, ATTACHMENT 4.1.11
VERSION: FINAL/AUGUST 1993

Attachment 1.11 – LIFE SAFETY EQUIPMENT DRAWING

**WEEKLY
EMERGENCY SHOWER AND EYEWASH INSPECTION
R/V LAKE GUARDIAN**

SECTION: CHAPTER 4, ATTACHMENT 4.2
VERSION: FINAL/AUGUST 1993
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Location	Equipment	X	Flow Test	X	Discrepancy	Date	Repair Date	Initial
PASSAGE OUTSIDE CHEM LAB (#1)	1. Sign		Full					
	2. Hood		Med					
	3. Handle		Slow					
			None					
WET LAB (#2)	1. Sign		Full					
	2. Hood		Med					
	3. Handle		Slow					
			None					
MODULAR PASSAGE FWD (#3)	1. Sign		Full					
	2. Hood		Med					
	3. Handle		Slow					
			None					
MODULAR PASSAGE AFT (#4)	1. Sign		Full					
	2. Hood		Med					
	3. Handle		Slow					
			None					

VESSEL SANITATION

1.0 SCOPE

To provide references and procedures to be used to ensure the proper sanitation for the vessel and crew.

2.0 REFERENCES

U.S. Public Health Publications
U.S. Navy Potable Specifications

3.0 RESPONSIBILITY - QUALIFIED PERSONNEL

- A. The Chief Engineer, under the authority of the Master, will undertake to fill and test, with the proper test chemical kits, the ship's potable water tanks under Section #7 below.
- B. The cook, under the authority of the Master, will be responsible to store, prepare, and cook all foodstuffs and dispose of all garbage aboard and adhere to daily and weekly inspections as listed below.

4.0 EQUIPMENT REQUIRED

- Potable water test kits
- Potable water hoses and fittings
- Sewage hoses and fittings
- Rat guards for mooring lines (should be inspected by First Mate)
- Temperature gauges for freezers and refrigerators
- Fixed and hand-held appliances

5.0 ANNUAL INSPECTION

The Master shall arrange for this inspection by a qualified public health person or U.S. Navy counterpart, and the certificate of acceptance is to be kept on board with copies sent to the EPA and the government contractor.

6.0 PERIODIC INSPECTIONS

A. For all refrigerators and freezers in use:

1. Mount a temperature chart on the face of each door.
2. Record the temperatures twice daily.
3. Notify the Chief Engineer if temperatures are above 42 ° F in the refrigerators or above 10° in the freezers.

B. Automatic Dishwasher:

1. Daily check water temperature at 180°F minimum.
2. Remove daily or more often any debris in bottom of dishwasher.
3. Use caution when opening door when dishwasher is in "Dry" cycle. Hot steam can cause burns.

C. Trash Compactor:

1. Make sure that proper size bags are being used and installed properly.
2. Do not place pressurized cans or glass in the compactor (injuries could result).
3. Close door securely before turning key or pressing start.
4. If compactor will not function electrically, notify Chief Engineer.

- D. All appliances used in the galley department must be checked during each use to ensure safe operation.
- E. Chief Engineer will test drinking water daily for coliforms with a litmus-type test kit. Suggested kit - *Colilert* ONPG MUG Presence/Absence kit.

- 1. Test different locations each day:

- a. galley
 - b. drinking fountains

- *Note on inspection log time and location.

- 2. Test weekly all remote faucets and sinks where potable water is obtainable.
 - 3. Any outlet which fails to test should be logged and tagged "Do Not Drink".
 - 4. Notify Master who will investigate the cause and determine if more of the system is contaminated, and if so, take corrective action immediately.

7.0 POTABLE WATER

- A. Chief Engineer will comply with Section 3.A of this attachment
- B. Use only designated potable hoses.
- C. Disinfect hose fittings and valve openings at both ends.
- D. Inspect all hoses under pressure for leaks. If any found, replace damaged section.
- E. Maintain vessel trim while filling.
- F. Notify bridge when pumping commences and is secured; advise

quantity taken aboard.

G. Drain all hoses, cap open ends, store equipment.

8.0 SANITARY DISCHARGE

- A. Equip work party with protective boots, gloves, suitable coveralls and VHF portable radios.
- B. Place containment pan under discharge valve to contain dripping during connecting and disconnecting procedure.
- C. Stretch hoses to either truck, sewer opening or fixed station, then connect lines insuring no kinks or bends. This could result in a burst hose
- D. Before pumping is complete, it may be necessary to flush all toilets to ensure that no lines are backed up if the holding tank was at capacity before pump out.
- E. Keep bridge apprised of pumping start and stop times when using septic trucks hauling two or three loads.
- F. Upon completion, close discharge valves, flush lines, coil hoses and stow in proper rack or reel.
- G. Remove containment pan, wash down and hose off deck, dock and any protective clothing as necessary before stowing.
- H. Return VHF radios to bridge.
- I. Chief Engineer to trim vessel and advise Master when operation is complete and log is signed on.

9.0 REFRIGERATION

- A. Notify Chief Engineer immediately of any malfunction with freezers, refrigerators or ice machine.

- B. Keep temperature logs as outlined under Section 6.0.A of this attachment.
- C. Food to be rotated to prevent freezer burn.
- D. Any spilled or spoiled food is to be removed and, if necessary, the unit defrosted and thoroughly cleaned before returning it to service.

FOOD SERVICE INSPECTION R/V LAKE GUARDIAN

SECTION: CHAPTER 4, ATTACHMENT 4.4
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ITEM	E	WT	ITEM	E	WT	ITEM	E	WT
1. Sources; sound conditions, no spoilage, milk pasteurized, meats-USDA approved.		5	19. Dishwashing facilities: properly designed, constructed, maintained, installed, operated.		2	35. Containers covered, adequate number, insect/rodent proof, clean, removal frequent.		2
2. Original container or approved dispenser, properly labeled.		1	20. Accurate thermometers or chemical test kits provided, gauge cocks provided.		2	36. Outside storage area enclosures properly constructed, clean, controlled incineration.		1
* 3. Potentially hazardous food meets temperature requirements during storage, preparation, display, service, transport.		5	21. Dishes and utensils pre-flushed, scraped, soaked.		1	* 37. No insects, rodents. Outer openings protected. No birds, turtles, other animals.		4
* 4. Proper facilities to maintain product temperature.		4	22. Wash, rinse water: clean, proper temperature.		2	38. Floors: properly constructed, drained, clean, good repair, covering, installation, dustless cleaning.		1
5. Thermometers provided and conspicuous.		1	* 23. Sanitizing rinse: clean, appropriate temperature, concentration, exposure time. Equipment, utensils sanitized.		5	39. Walls, ceilings, attached equipment: properly constructed, good repair, clean surfaces, dustless cleaning methods.		1
6. Potentially hazardous food properly thawed.		2	24. Wiping cloths: clean, stored, restricted in use.		1	40. Lighting provided as required, fixtures shielded.		1
7. Unwrapped and potentially hazardous food not reserved.		3	25. Food contact surfaces of equipment, utensils clean, free of abrasives and detergent.		4	41. Rooms and equipment vented as required; no odors, steam.		1
8. Food properly protected during storage, preparation, display, service, transportation.		2	26. Non-food contact surfaces of equipment, utensils clean.		1	42. Dressing rooms clean, lockers provided, facilities conveniently located and used.		1
9. Handling of food and ice minimized.		2	27. Satisfactory storage, handling of clean utensils, equipment.		1	* 43. Necessary toxic items properly stored, labeled, used.		5
10. In use, food and ice dispensing utensils properly stored.		1	28. Single-service articles: non-toxic, properly stored, dispensed, handled, in use when dishwashing facilities are not operating.		1	44. Premises maintained, free of litter, unnecessary articles. Cleaning/maintenance equipment properly stored. No unauthorized persons.		1
11. Fruits and vegetables washed.		1	29. No reuse of single service articles.		1	45. Complete separation from living/sleeping quarters, laundry.		1
* 12. Personnel with infections restricted.		5	* 30. Water source safe, hot and cold under pressure.		5	46. Clean, soiled linen properly stored.		1
13. Persons with hepatitis excluded for 45 days after symptoms.		2	31. Properly installed, maintained; non-potable piping identified.		1	SCORE: (100 less total weight of violation) WT = Weight E = Evaluation by Inspector		
14. Personnel have local food handlers certificates if required.		1	* 32. No back siphonage, cross-connection, backflow.		4			
* 15. Hands washed and clean, good hygienic practices.		4	* 33. Adequate number of toilets and sinks, convenient, accessible, properly designed, installed.		3			
16. Clothes clean, hair restrained.		1	* 34. Toilet rooms enclosed, self-closing doors, fixtures in good repair, clean. Hand cleanser, hand drying device, soap, toilet tissues, waste receptacles provided. Adequate ventilation.		3			
17. Food contact surfaces: adequately designed, constructed, maintained, installed, located.		2						
18. Non-food contact surfaces: adequately designed, constructed, maintained, installed, located.		1						

COMMENTS:

The items circled above were found violated on this date and must be corrected by next inspection or earlier.

* Critical items requiring immediate corrective action by Center Director.

A score of 70 or less requires follow-up correspondence from the Health Office with this inspection report detailing necessary corrective schedule for completion.

Inspected by: _____

Agency: _____

Signed

Title

Date

SEMI-ANNUAL LABORATORY HOOD EVALUATION FORM

Date: _____ Hood Location: _____

Instrument Used: _____

Inspected by: _____

$$\text{Average Face Velocity} = \frac{\text{Sum of Area Velocities}}{\text{Number of Velocities}}$$

Average Face Velocity = _____

Attachment 6 - MONTHLY INSPECTION FOR
SELF-CONTAINED BREATHING APPARATUS

SCBA # _____

I. COMPLETENESS

Ensure that all required components are available:

_____	Facepiece and
_____	Breathing tube assembly
_____	Regulator and
_____	Hose assembly
_____	Cylinder and
_____	Valve assembly
_____	Harness and
_____	Backplate assembly complete with all straps

II. CYLINDER PRESSURE

____ Cylinder charged to 2216 psi
____ Cylinder within hydrostatic test date

III. CONDITION CHECK

_____ A. Facepiece, breathing tube assembly and exhalation valve:

- visually examine for any signs of wear, deterioration, wrinkling or broken parts

_____ B. Face seal and breathing tube:

- pull or stretch gently to check for cracking

_____ C. Head harness:

- check for signs of wear
- ensure it is properly attached to facepiece

- _____ D. Check regulator for breakage or missing screws
- _____ E. Check supply hose for cuts or abrasion
- _____ F. Check cylinder and valve assembly for:
 - _____ • deep scratches, dents, heat exposure, or other deformities
- _____ G. Examine backframe and harness for signs of wear

IV. LEAK CHECK

- A. Apply soap and water solution to:
 - _____ • valve to cylinder connection
 - _____ • valve to hose connection
 - _____ • relief device
 - _____ • valve stem
 - _____ • hose to regulator connection

Expanding bubbles indicate leakage!

- B. Check breathing system:
 - _____ • open the main line valve fully;
 - _____ • hold breath and place facepiece against face while moving the selector lever, on the regulator, to the "ON" position;
 - _____ • close cylinder valve and observe remote gauge;
 - _____ • decrease in pressure indicates leakage;
 - _____ • use soap and water solution to isolate

V. OPERATIONAL CHECK

- A. Check diaphragm:
 - _____ • close both the main line valve and bypass valve completely;
 - _____ • gently inhale on the regulator outlet;
 - _____ • negative pressure should be maintained with no

- _____
- _____
- leakage through the regulator;
 - gently blow into the regulator outlet;
 - positive pressure should be maintained with no leakage through the regulator

B. Don the apparatus and operate it in a normal manner:

- _____
- _____
- _____
- _____
- _____
- open the cylinder valve to activate alarm;
 - alarm will sound momentarily and stop;
 - air should flow only during inhalation or when the bypass valve is opened;
 - if any other flow is noted, check facepiece-to-face seal; be sure the bypass valve is closed and repeat procedure
 - continuing airflow through facepiece indicates malfunction

C. Alarm will sound when the regulator gauge indicates 1/4 remaining service life:

- _____
- place facepiece to face, turning the cylinder valve off and breathing slowly while observing the regulator gauge

_____ D. Disinfect facepiece

_____ E. Reassemble equipment

VI. REPORT ANY DEFICIENCIES TO THE SAFETY EQUIPMENT MANAGER

Notes: _____

Inspected By: _____

Attachment 4.7 - HAZARDOUS WASTE STORAGE AREA INSPECTION

Location _____

✓Y or N

- ☐ ☐ Are the containers in good condition (no leaks, rusting containers, or bulges)?
- ☐ ☐ Is the storage area free of debris?
- ☐ ☐ Are the containers properly contained (e.g., in a diked area)?
- ☐ ☐ Is the floor dry (no sign of spills)?
- ☐ ☐ Are the containers properly labeled, including start accumulation date?
- ☐ ☐ Are the inorganic containers interlined with polyethylene?
- ☐ ☐ Are the containers closed?
- ☐ ☐ Are containers holding incompatible wastes kept apart by physical barrier or sufficient distance?
- ☐ ☐ Is spill cart adequately stocked (see spill cart inspection form)?

If any of the above were answered no, please provide explanation:

Number of Blue Label Basic Hazardous Waste Containers _____

Number of Red Label Acid Hazardous Waste Containers _____

Number of Yellow Label Acid Hazardous Waste Containers _____

Number of Green Label Flammable (>50 ppm PCBs) _____

Hazardous Waste Containers

Number of Purple Label Flammable (>50 ppm PCBs) _____

Hazardous Waste Containers

Number of Radioactive Waste Containers _____

Oldest start accumulation date _____

Most recent shipment by date _____

Inspected By

Date

Reviewed By

Date

Attachment 4.8 - SPILL CART CHECKLIST FORM

<u>Quantity</u>	<u>Description</u>
30	Universal Spill Control Pillows™, 1 liter size
50	Hazardous Material Disposal Bags, 12"x18"
20	VBS Blankets™
4 kg	Hg Absorb™ Powder
1.1 kg	Resisorb™
3.2 kg	Neutrasorb® Acid Neutralizer
1.2 kg	Neutracit® Caustic Neutralizer
1	Chemop™
6	Chemsponges™
1	Spill Squeegee, floor size, 18" head
1	Spill Squeegee, bench size, 8" head
1	24 oz. Mophead & handle
1	Polypropylene Broom
1	Bench Brush
1	Dust Pan
1 roll	KIMTEX™ Towels, 9 3/4"x 100 ft. roll
1	Sponge, cellulose
1	Liquid Cleaner, 32 oz.
1	Clorox, 1 gallon
1 roll	pH Paper
1 roll	Barricade tape, 100 ft.
1	Sealing Tape for clothing containers, 180 ft.
1 each	Safety Flashlight & Power Shell Battery Pack
1	Tongs, 20" long
1	SpillKART™ with rigid liner
6	SpillKART™ Liners, yellow, 36" x 48"
1	Mop Bucket, 35 qt.
1	Wringer
1	Floor Sign
1	Glass Disposal Box, 8" x 8" x 10"
2	Chemical Spill Clothing Kits, each kit includes:
1	Total Body Coverall, poly laminated Tyvek
1 pair	Nitrile Gloves
1 pkg.	Disposable Polyethylene Gloves

SPILL CART CHECKLIST FORM (continued)

	<u>Quantity</u>	<u>Description</u>
_____	1 pair	Chemical Splash Goggles, fog-free lens
_____	1	Respirator with dust, acid gas/organic vapor cartridges
_____	1	Hydrogen Fluoride Respirator
_____	1	Toxic Dust Respirator

Checked By: _____

Date: _____

Attachment 4.9 - GLNPO SPECIFICATIONS FOR DRY-DOCKING AND OVERHAUL INSPECTIONS

The following items must be included in a five year dry-docking and overhaul inspection:

1. Dry Docking
2. Services
 - a. Docking Services
 - b. Shore Power
 - c. Gangway
 - d. Fire Hose
 - e. Waste Removal: Unclassed/Hazardous
 - f. Office Space
3. Hull Inspection
 - a. Bottom Plate
4. Zinc Anodes
 - a. Zinc Restoration
5. Engine Alignment
6. Propellers
 - a. Propeller Inspection
 - b. Propeller Restoration
7. Propeller Shafts/Bearing
8. Rudder
9. Sea Chests/Overboard Values
10. Bottom Paint
11. Vents
12. Water Tight Doors/Hatches

- 13. Transducer
- 14. Anchors/Chains
- 15. Inclining
- 16. Electrical
- 17. Alarm System
 - a. Tank Level Alarm System
- 18. Pumps
 - a. Hydraulic
 - b. Fire
 - c. Bilge
 - d. Repairs
- 19. Engines
 - a. Mains
 - b. Generators
- 20. Safety Equipment
 - a. Rafts
 - b. Extinguishers
 - c. Fire Suppression Systems
- 21. Navigation Equipment
 - a. Auto Pilot
 - b. Gyroscope
 - c. Radars
 - d. LORAN
- 22. Waste Holding Tanks
- 23. Labor Rates

Chapter 5 - RESEARCH VESSEL HEALTH AND SAFETY

GLNPO RESEARCH VESSEL HEALTH AND SAFETY - INTRODUCTION

Unique to GLNPO research vessels are their on-board laboratories. This feature, in addition to normal marine operations, requires adherence to rigorous health and safety procedures. Each vessel must develop and implement a Chemical Hygiene Plan designed to protect laboratory personnel from exposure to health hazards during work operations. Also, all GLNPO shipboard personnel must be familiar with marine safety practices associated with large and small boat operations. Although each vessel is staffed with an experienced professional crew, it is the policy of GLNPO to ensure that all personnel aboard each research vessel receive health and safety training relative to the specific hazards they may encounter while on board.

5.1 GLNPO CHEMICAL HYGIENE PLAN

Since laboratory work operations typically involve exposure to or use of toxic substances, specific health and safety programs are required. These programs are not merely limited to laboratory safety training. The Occupational Safety and Health Administration (OSHA) requires facilities engaged in the laboratory use of hazardous chemicals to develop and implement a "Chemical Hygiene Plan" as specified in 29 CFR 1910.1450. A Chemical Hygiene Plan contains procedures and work practices designed to protect laboratory personnel from exposure to health hazards during their work operations. As such, a Chemical Hygiene Plan must be developed for each GLNPO laboratory. The Chemical Hygiene Plan for GLNPO research vessels is attached as **Appendix J** of this manual.

5.2 SAFETY ORIENTATION VIDEO

New employees on board any GLNPO research vessel are required to receive site-specific safety training. Such training will include basic safety regulations, evacuation procedures, location of PPE, and specific hazards to which they may be exposed while on board the vessel. As part of this training, an instructional video will be presented and personnel will be required to document that they understand its contents. Additionally, all GLNPO personnel and contractors will be required to know the location of the Health & Safety Manual and the Material Safety Data Sheets. A GLNPO vessel orientation narrative appears as **Attachment 5.1** of this chapter. A video confirmation form appears as **Attachment 5.2**.

5.3 SAFETY CARD - HIGHLIGHTS KEY ISSUES

The "Safety Card" is designed to familiarize personnel with the locations of emergency supplies and equipment as part of the overall safety and health program for GLNPO research vessel operations. The "Safety Card" illustrates the locations of rafts, emergency exits, fire extinguishers, flotation gear, chemical spill equipment, emergency eyewash/showers, and raingear, throughout all operational areas on board GLNPO research vessels. It will be distributed to all personnel who visit or regularly work on board the vessels.

5.4 BOAT HANDLING AND SEAMANSHIP

As described in Chapter 1 of this manual, the Great Lakes National Program Office maintains a fleet of research vessels specifically outfitted for limnological research. These vessels range in size from 33 feet to 180 feet with sampling missions lasting from 1 to 30 days. Those vessels outfitted for daily sampling missions are capable of maneuvering in the rivers, creeks and streams which empty into larger bodies of water. The large vessels, on the other hand, are equipped for lengthy sampling missions in the vast expanses of the Great Lakes.

While many health and safety practice procedures apply to both small and large vessels, there are specific differences. On board a small boat, crew movement, docking, and anchoring are significant safety issues. However, on large vessels, use of heavy equipment becomes a primary safety concern. To achieve maximum health and safety aboard all GLNPO vessels, it is the ultimate responsibility of each crew member to comport themselves in a safe and competent manner.

5.4.1 SAFE BOATING OPERATIONS - SMALL AND LARGE VESSELS

Safe boating is based on good sense, education and experience. Each GLNPO research vessel will be piloted by an accomplished boat operator and a chief scientist will monitor all activities. It is the responsibility of each crew member to report any unsafe condition and to work only within their ability. Should crew members encounter situations about which they are uncertain, they must report to the appropriate ship personnel before taking action. There is always an element of danger when working on the water.

5.4.2 PERSONAL FLOTATION DEVICES

Life jackets (personal flotation devices) must be worn any time the vessel is away from the dock and you are on deck. A range of sizes are available. Eighty-five percent of the people who have died in boating accidents were not wearing PFDs.

Three types of PFDs are in use on EPA research vessels. Type 1 offers the greatest buoyancy and will automatically turn an unconscious person face up while in the water. However, these PFDs are bulky and difficult to work in. The second type of PFD, also called a keyhole vest, will keep an unconscious person face up but not as efficiently as a Type 1 PFD. The Type 2 life jacket is used more often when the boat is working close to shore where a quick, land-based rescue is possible. The third type of PFD is a flotation aid or work vest. It permits the most freedom of movement but is not designed to hold an unconscious person upright in the water.

5.4.3 MAN OVERBOARD PROCEDURES

If a crew member should witness someone falling overboard, the following procedures are to be executed:

1. Scream "Man Overboard" to get the attention of others but **do not take your eyes off the person in the water.**
2. Point to the position of the person in the water.
3. At the first cry of "Man Overboard", the boat operator will freeze the Loran C display and place the engines in neutral.
4. Prepare to throw the life ring when the victim comes within range.
5. After the victim is pulled to the side of the vessel, the crew can assist the person to get back on board at the direction of the boat operator. **No one is permitted to go into the water to retrieve the victim unless directed by the boat operator.** Jumping into the water in order to "save" someone often results in two victims requiring rescue.
6. If the victim is not recovered immediately or is lost from sight, the Coast Guard should be notified immediately as well as other boats in the area that can assist in a search effort.

7. After the Coast Guard is notified, the boat operator will begin a search pattern using the position placed in the Loran C memory.

5.4.4 FIRE

The possibility of fire on board ship is always of great concern. If fire should occur, it may be fought without the assistance of fire fighting professionals. Consequently, it is important that research vessel personnel keep in mind fire safety when considering all shipboard activities.

When first aboard, vessel personnel will be apprised of the location of fire extinguishers and review the ship's fire fighting plans and procedures with the boat operator. Decisions regarding fire fighting assignments will be made at the beginning of each survey and the boat operator will be responsible for the plan and the assignment of fire fighting stations and duties.

5.4.5 WEATHER

Weather conditions can change rapidly on the water. Therefore, it is important to always be aware of these changes and to act accordingly.

5.4.6 DISTRESS SIGNALS

Despite being as well prepared as possible, there may be times when assistance is needed. In addition, the law requires that assistance be rendered to other boaters in distress.

Visual hand signals may be used to attract attention and indicate a need for help. Additionally, flares and dye markers may be used to signal for assistance. Channel 16 on the marine radio is the channel reserved for emergency transmissions. If a "MAYDAY" distress call is heard from another vessel, do not use Channel 16 and allow the Coast Guard to respond. If a GLNPO research vessel is in a position to render assistance, contact the Coast Guard as soon as there is a break in radio traffic.

5.4.7 FUELING

The greatest potential for fire occurs during the fueling of a vessel. Each year lives

and boats are lost due to explosions and fires related to fueling operations.

The following procedure must be used during fueling of EPA vessels:

1. The boat operator will handle the fueling of the vessel.
2. All crew not helping the boat operator are to leave the vessel and the immediate fueling area until the operation is completed and the boat operator signals you to reboard the vessel.
3. During fueling, there must be absolutely no smoking in the fueling area.
4. The engines and all electrical equipment must be switched off prior to fueling.
5. All doors, windows, and hatches must be closed prior to fueling.
6. While fueling, keep the gas pump nozzle in contact with the filler pipe to prevent sparks.
7. When fueling is completed, replace all gas caps, switch on the bilge blowers, and check for gas fumes in the engine compartment.
8. Start engines, secure blowers, and permit the crew to come aboard.

5.4.8 RULES OF THE ROAD

The operator of a vessel must have a thorough understanding of the nautical rules of the road. The following rules should be followed by all boat operators:

1. If you encounter a vessel coming head on, make a clear turn to the right to indicate your intention to pass the other vessel on your left.
2. You are to give way if a vessel is approaching your line of direction from your right.
3. Always keep in mind that the people aboard the other vessel may not know what they are doing so be ready to take evasive action if necessary.
4. Sailboats under sail always have the right of way.

5. If you are passing a vessel, you must stay clear.
6. You are responsible for your wake and any damage that it may cause. You must obey all speed limits and No Wake Zones.

5.5 SMALL BOAT OPERATIONS

In addition to use of personal flotation devices, man overboard procedures, fire safety, weather awareness, distress signals, fueling procedures, and rules of the road, small boat operations include embarking, anchoring, and docking activities.

Examples of small boat standard operating procedures can be found in the *SSI Occupation Safety and Health Program Manual* contained in **Appendix N** of this manual.

EMBARKING PROCEDURES

The following procedures are used when leaving the dock:

1. Don personal flotation devices (PFDs).
2. Start engines and allow them to warm up.
3. Follow the boat operator's directions for releasing dock lines making sure that no lines are in the water.
4. **NEVER CAST OFF FROM THE DOCK UNTIL ORDERED TO DO SO BY THE BOAT OPERATOR.**
5. Once the vessel is underway, stay seated.

DOCKING PROCEDURES

When docking the boat, the boat operator needs to concentrate on the docking procedure. Try to avoid conversation at this time, pay close attention to what is going on and be prepared to assist as directed by the boat operator. The following should be considered when docking:

1. The boat operator will assign duties. Learn the docking procedures and be prepared to implement them.

2. Secure the fenders to the side of the vessel as directed by the boat operator.
3. Prepare bow and stern dock lines. A crew member should standby each line.
4. As the vessel comes into the dock, watch for any obstructions in the water that the boat operator may not see and immediately bring them to his/her attention.
5. **Never jump from the vessel to the dock.** One could fall and be crushed between the dock and the vessel.
6. Never use arms or legs to slow the boat as it comes into dock. The boat operator will use the boat's engines to do this.
7. As the boat enters the dock, make sure that you are not blocking the boat operator's view.

ANCHORING PROCEDURES

An anchor is a device used to hold a vessel in position while away from the dock. One, two or three anchors may be used to hold a vessel in position. The following is the general procedure for deploying and retrieving anchors:

Deployment

1. Make sure the anchor is attached to the anchor line.
2. Do not toss the anchor out away from the boat. Rather, lower it when signaled by the boat operator.
3. As the boat reverses, take a turn around the cleat and let the line out. Never allow the line to run freely through your hand. An attempt to stop a free-running line can deliver a burn or even a deep cut to your hand.
4. When you are letting line out, make sure you are not standing on the anchor line and that it is not tangled around your foot or any other object

in the boat.

5. The length of rope needed to be played out, called the scope, is generally 6 to 8 times the depth of the water in which you are anchoring.
6. When securing the anchor line to the cleat, take at least two turns before cleating off the anchor line.

Retrieval

1. As the boat moves forward and the strain is removed from the anchor line, release the anchor line and begin taking it in. Always keep a turn on the cleat.
2. When the anchor line is running straight up and down, try to pull up the anchor. If the anchor is not free, turn the cleat a few times and signal the boat operator to run forward slowly while you keep the anchor line fast. When the boat operator stops the forward movement of the boat, try once more to lift the anchor. Replace the anchor on deck and secure it prior to getting underway.

KNOTS

There are a few basic knots that are useful when working on a vessel. They include the cleat hitch, figure eight knot, round turn and two half hitches, the bowline knot and the clove hitch.

5.6 LARGE BOAT OPERATIONS

Again, the use of personal flotation devices, man overboard procedures, fire safety, weather awareness, distress signals, fueling procedures, and rules of the road, apply to large vessels, as well as small vessels. The large vessels, however, are outfitted with heavy equipment such as "A" frames, knuckle/pivot cranes, rigging, and hoists. Information regarding SOP Deck Safety Practices during use of this type of heavy equipment appears in the ship contractor's *Occupational Safety and Health Program Manual* in Appendix N of this manual.

Attachment - 5.1 WELCOME ABOARD STATEMENT FOR THE R/V LAKE GUARDIAN

The United States Environmental Protection Agency, Seaward Services, and the Master, officers and crew of the R/V Lake Guardian welcome you aboard. We hope your stay on board will be a pleasant one. Our goal will be to assist you to bring your research programs to a safe and successful conclusion.

We appreciate your cooperation in accomplishing this goal and we ask that you review the material in this handout. Should you have any questions or encounter problems regarding the items presented herein, please bring them to the attention of the ship's Master via the Chief Scientist.

This informational handout will provide some essential facts and useful information to insure you have a safe and comfortable voyage. Please do not hesitate to ask questions concerning any subject about the ship. We will be happy to provide explanations and/or demonstrations when possible. If you find you are having a problem, please bring it to the attention of the ship's Master (Captain), the Mate on watch or the Chief Scientist.

OPERATING AUTHORITY

The Lake Guardian is operated for and under the control of the U. S. EPA's Great Lakes National Program Office. An operating crew of professional seamen is furnished by Seaward Services, Inc. Lab support is provided by personnel from Enviroscience. Lab and ship safety overview is provided by Helix Environmental, Inc. When the ship is at sea, a senior scientist from U. S. EPA/GLNPO is assigned responsibility for all movements and activities aboard the ship, in conjunction with the ship's Master. These two individuals have the final word on any issue which might arise while at sea.

MISSION

Lake Guardian's mission is to gather information about the chemical and biological conditions of the Lakes, and to monitor the pollutant concentrations in water, sediments, air, fish, and other biological matter. On occasion, the ship may be used for other scientific interests, including research activities of other federal, state and local agencies as well as academia.

GENERAL DESCRIPTION

Lake Guardian is U. S. EPA's newest, largest and cleanest surveillance and monitoring vessel. It was converted in 1990 from a former offshore oil field service vessel originally built in 1981. During the conversion period, all of the structures aft of the exhaust stacks were added.

In 1991, the four container labs and the HVAC (heating, ventilation and air conditioning) van were added to the ship, as well as the large stern U-Frame. The ship is 180 feet in overall length, with a beam (width) of 40 feet. Depending on loading conditions, it can have a draft (underwater portion of the hull) of up to 11 feet. Lake Guardian is powered by two 1125 HP Caterpillar diesel engines, each driving its own propeller shaft. Electrical power is provided by three 135 KW Caterpillar diesel engines. A bow thruster, powered by a 300 HP Caterpillar diesel engine, aids in the ship's ability to maneuver in close quarters. It is also used in station keeping. When operating at full power, the ship can make 13 miles per hour and will consume in excess of 100 gallons of fuel per hour.

LIFE ABOARD LAKE GUARDIAN

Knowledge of the ship's layout will assist you in accomplishing your daily activities, and is vital in determining the appropriate response for emergency situations, both real and simulated. Please study the deck plans, note the locations of fixed fire stations, portable fire extinguishers and abandon ship stations.

Because of Lake Guardian's unique mission, schedules and routines are inherently rigid. It is suggested that you keep abreast of vessel movements, scientific activities and the weather so that you are aware of emerging conditions which may affect you and/or your work aboard the ship.

Lake Guardian has berthing for up to 43 persons, including the crew. Most staterooms set aside for scientific personnel have two fixed bunks (upper and lower) as well as a fold-down pullman bunk for a third person. These pullman bunks are used only when a maximum complement of personnel is carried aboard; some crews may have to share accommodations. Stateroom assignments are made jointly by the ship's Master and the Chief Scientist.

Each stateroom and bunk contains a card which designates the emergency mustering location for the persons in that stateroom.

REPORTING ABOARD

Plan to report aboard at least one hour before sailing time. Upon arrival you should report to the Chief Mate, who will sign you aboard and provide an orientation of the vessel's physical arrangements including assigned berthing area. Berthing assignments for science personnel are made by the Chief Scientist.

Linens, towels, etc. will be provided when you arrive on board. Upon departure from the vessel, kindly strip your bunk and store the soiled linen in the laundry basket provided near the washing machine on the port side of the main deck, forward. Fresh linen will be issued once per week, the time of which will be announced in advance.

For your safety, you are required to accomplish the following immediately after receiving your berthing assignment:

- Insure that your life jacket is in place on your bunk.
- Insure that your survival suit is in place on your bunk.

Refer to the station bill posted in the mess deck and find your assigned life raft, fire and abandon ship stations.

Become familiar with the signals for fire and abandon ship; a drill will be conducted upon departure from the first port and at least once per week thereafter.

Safety Rule:

One hand for you and one hand for the ship. Make two trips if necessary or get someone to help you. In addition, all persons working or observing on deck must wear a work vest. NO EXCEPTIONS.

PERSONAL POSSESSIONS

Seaward Services, Inc. cannot be responsible for the loss of personal effects. Items of significant value should be left ashore, or given to the ship's Master for storage in the ship's safe.

SAILING TIME

Science personnel should plan to arrive on board at least one hour before sailing time. Allow sufficient time prior to departure to turn in rental cars, load equipment, etc.. Sailing time may be delayed at the Master's discretion if science/technical personnel report aboard in a condition which he considers unsafe. Further delays in sailing are announced should equipment malfunction occur, or when late deliveries of equipment and supplies are experienced.

WORK DECK

The Chief Scientist or his designated representative will advise the Master of any sampling, launching, streaming or retrieval activity required. The ship's cranes, winches, tools, rigging, etc. are to be operated by ship's crew only; however, during extended operations, scientific personnel may be asked to participate in these activities.

Scientific personnel should direct all inquiries to the Master, through the Chief Scientist, in matters concerning work on deck, navigation, safe working parameters, use of ship's equipment etc. Use of this procedure will avoid working at cross purposes.

When the ship is entering or leaving port, or during periods of poor visibility or high traffic activity, and at the Master's discretion, the pilothouse should not be visited. You may assemble on the 0-1 level (boat) deck if you so desire.

While steaming during hours of darkness, no unauthorized lights should be displayed on deck. This is to comply with the Rules of the Road; lights shown forward of the deck house are detrimental to the night vision of the conning officer. While on station and engaged in sampling/test operations, adequate night lighting will be provided.

LABORATORIES AND SCIENTIFIC EQUIPMENT

There are four laboratories located aboard the Lake Guardian: chemistry lab (lower deck forward), microbiology lab (main deck midship-starboard side), wet lab (main deck-forepart of deckhouse) and container lab (boat deck-starboard side). The equipment and instruments contained in these labs are primarily for support of the basic monitoring function of the ship. Some or all of this equipment may be made available for use by guest scientists at the discretion of

the U. S. EPA Project Officer or his designated representative.

MESSING

Our cook prepares and serves varied and nutritious meals for our crew and the embarked scientific party. The small refrigerator below the salad bar is designated for your use during other than meals hours. Feel free to partake of the cold cuts, leftovers, fruit and soft drinks provided. Normal meal hours are as follows:

Breakfast: 0730-0830

Lunch: 1130-1230

Dinner: 1700-1800

When large numbers of personnel are carried aboard, it is requested that meals be eaten comfortably but quickly. We have seating for 19 but must feed up to 43 personnel.

The stainless steel refrigerator in the galley and the walk-in refrigerator and freezer contain food for preparation of regular meals. We request that you do not open these units, but rather ask the cook for any item which you cannot find in the salad bar refrigerator. We further request that any mess gear used outside normal meal hours be scraped clean by the user and placed in the cart provided for dishes and utensils to be cleaned.

We request that the mess area be vacated by all personnel 30 minutes before and after each meal in order that the cook have ample space to prepare the area for meals and to square away after meals.

Certain other amenities are expected and required:

1. Appropriate clothing shall be worn to meals; this includes shirt and shoes.
2. Good breeding and shipboard protocol dictate that caps and other headgear be doffed when entering the mess area while the ship's company is at mess.
3. Late arrivals to meals due to watch standing is expected, however, general nonconformity with the meal schedule is considered poor

form. On occasion, ship's crew reporting for watch may be served ahead of someone who has been waiting. Since the crew must report on time, your consideration will be appreciated.

4. When entering the mess area for meals, neither space nor sanitary considerations permit visits to the galley to look things over. A menu is posted on the whiteboard. Take your dinnerware from the dispensers provided and proceed to the salad bar and hot table and then to the seat of your choice.
5. The mess area is designated a no smoking area at all times.
6. During mealtimes, no food is permitted in the lounge.

SAFETY EVACUATION PROCEDURES

Ship evacuations will be conducted in accordance with the ship's station bill, as shown in **Attachment 8.1** of the Safety, Health, & Environmental Safety Manual.

ALCOHOLIC BEVERAGES AND ILLEGAL DRUGS

Alcoholic beverages and illegal drugs in any form will not be consumed or brought aboard by any persons. Any personnel found to be in violation of this regulation will have the substance confiscated and, upon arrival at the next port, will be discharged from the vessel. Further, any person found to be in violation shall be reported to the local authority and prosecuted to the full extent of the law.

FIREARMS

Firearms are prohibited on board the R/V Lake Guardian.

WASHING MACHINES AND DRYERS

Washing machines and dryers are provided and available for use by all personnel aboard.

The washing machines should only be used when you have a full load; use for

partial loads will deplete the ship's fresh water supply. Use less than 1/2 cup of detergent for a full load; additional soap creates heavy sudsing which strains the machine and can leave residue in your clothing. The washing machines may be used while the ship is on station and collecting samples since the ship retains all waste water.

POTABLE WATER AND SEWAGE CAPACITY

The potable water and sewage holding capacity on board the Lake Guardian is severely limited. The showers, sinks, washing machine and toilets drain into a holding tank (for later transfer ashore).

The following guidelines are set forth to ensure conservation of resources:

- Flush toilets only when required for human waste; all other disposable materials should be placed in a waste container. Also, please remain till the water has stopped running in the toilet. Any toilet, shower, or faucet that leaks must be reported immediately to the Bridge so it can be repaired.
- When showering, please be brief; the water supply is limited. Each shower head is equipped with a mixing valve. In order to control the water temperature turn the handle counterclockwise to increase the temperature and clockwise to decrease the temperature.
- Showers and washing machines can be used when on or approaching a sampling station. Low phosphate detergent is provided for your use by the ship; do not use other types of soap in the washing machine.

CLEANLINESS

Cleanliness of the vessel is an "all hands" exercise. Our limited crew size demands that each person on board do his share to assist in maintaining clean, neat and orderly conditions. Personnel assigned to each space are responsible for the cleanliness of that space. Public areas of the vessel (heads, passageways, mess area, etc.) are assigned to members of the crew for cleaning. Your cooperation in this matter will be appreciated.

COMMUNICATIONS

Daily radio contact is made with the Seaward Service's office. The Master can handle routine or emergency traffic via the marine operator as may be required. Personal and business calls will be made by credit card or collect only, unless prior arrangements have been made to pay for this service.

Use of the cellular phone, when activated and in a coverage area, is for government and business use only. Permission to use same must be obtained from the Master or Chief Scientist and all calls must be logged.

SMOKING

In an effort to maintain the enclosed spaces of the ship as "sweet smelling" as possible, we request that smokers restrict this activity to outside areas.

FUELING

Whenever the vessel is taking on fuel, as evidenced by the red "bravo" flag flying by day or by a red light on the mast at night, the smoking lamp shall be extinguished throughout the vessel. Announcements shall be made to further warn personnel when fueling operations are being conducted. **There shall be no smoking throughout the vessel.**

STANDARD OPERATING PROCEDURES

A manual of Standard Operating Procedures (SOPs) is located in the main deck passageway. Included in this manual are procedures for performing certain functions aboard the vessel which could endanger the safety of personnel or equipment. At their earliest opportunity, all scientific personnel should read and become familiar with these procedures. Further, in the laboratory office is the U.S. EPA Region 5 Health and Safety Manual. Again, it is incumbent upon all scientific personnel to become familiar with this manual and to abide by the requirements contained therein.

RESPONSIBILITY OF THE MASTER

The ship's Master (Captain) assumes responsibility for the safe operation and

navigation of the ship. He is responsible for the safety of all personnel on board and may curtail, delay or cease all operations if, in his judgment, the vessel, personnel or equipment are in jeopardy. The Master will confer and cooperate with the Chief Scientist/Trial Director in making decisions at these times, and will comply with the test plan so far as possible to achieve the goals set forth therein.

TOURS OF THE VESSEL BY THE PUBLIC

The R/V Lake Guardian is funded by taxpayer dollars and an effort is made by U.S. EPA and Seaward Services, Inc. to insure that the vessel is available to the general public on a not-to-interfere basis with scientific operations, repair and maintenance work or crew privacy. With this in mind, scientific and crew personnel desirous of providing interested parties with a tour of the vessel must first check with the Master or the U. S. EPA Project Scientist before conducting such a tour. We request that tours be conducted only during the hours of 0900-2000, with the exception of mealtimes. Only public areas (lab passageways, pilothouse, open deck areas) of the vessel may be shown. Berthing areas are off limits for tours, except for unoccupied cabins which may have open doors for viewing purposes only. Visitors should not enter the cabins. Ship's company violating this simple courtesy will be subject to immediate discharge from the vessel.

This concludes our indoctrination procedure for our planned cruise. If we work as a team, everyone does their job, and Mother Nature smiles upon us, we can expect another rewarding experience both personally and professionally.

Attachment 5.2 – SAFETY ORIENTATION VIDEO

I, _____, have viewed the Safety Orientation Video, understand its contents, and am familiar with the emergency response equipment, the location of the Material Safety Data Sheets and the Health & Safety Manual.

Signature _____

Date _____

Instructor's Signature _____

Chapter 6 - PERSONAL PROTECTIVE EQUIPMENT

6.1 GLNPO PERSONAL PROTECTIVE EQUIPMENT POLICY

It is the policy of GLNPO to determine the levels of protection required for personnel assigned to specific field or laboratory operations and to provide appropriate protective clothing and equipment, as well as enforcing its correct use. Training requirements, use and control of personal protective clothing, and equipment are further discussed in **Appendix I** of this manual. A Personal Protective Clothing and Equipment Assignment Sheet is included as **Attachment 6.1**.

Each year all GLNPO field and laboratory personnel will be surveyed regarding existing health and safety equipment inventory as well as any additional requirements. All GLNPO safety purchases must be reviewed and approved by the Region V Safety Manager. Please also refer to Chapter 12 of the U.S. EPA Region V Health and Safety Manual.

6.2 LEVELS OF PROTECTION

I. Introduction

Response personnel must wear protective equipment when there is a probability of contact with hazardous substances that could affect their health. This includes vapors, gases, or particulates that may be generated by site activities, and direct contact with skin-affecting substances. Full facepiece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals. Good personal hygiene habits prevent ingestion of material.

Equipment to protect the body against contact with known or anticipated toxic chemicals has been divided into four categories according to the degree of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser degree of skin protection is needed.

Level C: Should be worn when a lesser level of respiratory protection is needed than Level B. Skin protection criteria are similar to Level B.

Level D: Should be worn only as a work uniform and not on any site with respiratory or skin hazards. It provides no protection against chemical hazards.

The Level of Protection selected should be based on the hazard and risk of exposure.

Hazard: Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.

Risk: Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate Level of Protection must be selected based on professional experience and judgment until the hazards can be better characterized.

Personal protective equipment reduces the potential for contact with toxic substances. Additionally, safe work practices, decontamination, site entry protocols, and other safety procedures further ensure the health and safety of responders. Together, these provide an integrated approach for reducing harm to response personnel.

II. Levels of Protection

A. Level A Protection

1. Personal protective equipment

Pressure-demand, supplied-air respirator approved by the Mine Safety and Health Administration (MSHA) and National Institute for Occupational Safety and Health (NIOSH). Respirators may be:

- pressure-demand, self-contained breathing apparatus (SCBA), or
- pressure-demand, airline respirator (with an escape bottle for atmospheres with, or having the potential for, Immediately Dangerous to Life and Health (IDLH) contaminant concentrations).

Fully encapsulating chemical-resistant suit

Coveralls*, or

Long cotton underwear*

Gloves (inner), chemical-resistant

Boots, chemical-resistant, steel toe and shank. (Depending on suit construction, worn over or under suit boot)

Hard hat* (under suit)*

Disposable gloves and boot covers* (Worn over fully encapsulating suit)

Cooling unit*

2-Way radio communications (inherently safe)

2. Criteria for Selection

Meeting any of these criteria warrants use of Level A Protection;

* Optional

- The chemical substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system.
- Substances with a high degree of hazard to the skin are suspected to be present, and skin contact is possible. Skin contact includes: splash, immersion, or contamination from atmospheric vapors,

gases, or particulates.

- Operations must be conducted in confined, poorly ventilated areas until the absence of substances requiring Level A protection is determined.
- Direct readings on field Flame Ionization Detectors (FID) or Photoionization Detectors (PID) and similar instruments indicate high levels of unidentified vapors and gases in the air.

3. Guidance on Selection

- a. Fully encapsulating suits are primarily designed to provide a gas or vapor tight barrier between the wearer and atmospheric contaminants. Therefore, Level A is generally worn when high concentrations of airborne substances that could severely affect the skin are known or presumed to be present. Since Level A requires the use of a self-contained breathing apparatus, more protection is afforded to the eyes and respiratory system.

Until air surveillance data are available to assist in the selection of the appropriate Level of Protection, the use of Level A may have to be based on indirect evidence of the potential for atmospheric contamination or other means of skin contact with substances having severe skin-affecting properties.

Conditions that may require Level A protection include:

- Confined spaces: Enclosed, confined, or poorly ventilated areas are conducive to build up of toxic vapors, gases, or particulates.

An entry into an enclosed space does not automatically warrant

Level A protection, but should serve as a cue to carefully consider the justification for a lower Level of Protection.

- Suspected or known highly toxic substances: Various substances that are highly toxic, especially through skin absorption, require Level A Protection. Technical grade pesticides, concentrated phenolic compounds, Poison "A" compounds, fuming corrosives, and a wide variety of organic solvents are of this type.

Carcinogens, and infectious substances known or suspected to be involved may require Level A protection. Field instruments may not be available to detect or quantify air concentrations of these materials. Until these substances are identified and their concentrations determined, maximum protection is necessary.

- Visible indicators: Visible air emissions from leaking containers or railroad or truck tank cars, as well as smoke from chemical fires and others, indicate high potential for concentrations of substances that could be extreme respiratory or skin hazards.
- Job functions: Initial site entries are generally walk-throughs in which instruments and visual observations are used to make a preliminary evaluation of the hazards.

In initial site entries, Level A should be worn when:

- There is a probability for exposure to high concentrations of vapors, gases, or particulates.
- Substances are known or suspected of being extremely toxic directly to the skin or by being absorbed.

Subsequent entries are to conduct the many activities needed to reduce the environmental impact of the incident. Levels of Protection for later operations are based not only on data obtained from the initial and subsequent environmental monitoring, but also on the protective properties of suit material as well. The probability of contamination and ease of decontamination must also be considered.

Examples of situations where Level A has been worn are:

- Excavating soil to sample buried drums suspected of containing high concentrations of dioxin.
- Entering a cloud of chlorine to repair a valve broken in a railroad accident.
- Handling and moving drums known to contain oleum.

- Responding to accidents involving cyanide, arsenic, and undiluted pesticides.
- b. The fully encapsulating suit provides the highest degree of protection to skin, eyes, and the respiratory system given that the suit material resists chemicals during the time the suit is worn. While Level A provides maximum protection, all suit materials may be rapidly permeated and degraded by certain chemicals. These limitations should be recognized when specifying the type of fully encapsulating suit. Whenever possible, the suit material should be matched with the substance it is used to protect against.

NOTE: GLNPO has never experienced a situation where Level A conditions have been necessary. Nevertheless, this section is included in case such a situation does occur.

B. Level B Protection

1. Personal Protective Equipment

Pressure-demand, supplied-air respirator (MSHA/NIOSH approved). Respirators may be:

- pressure-demand, self-contained breathing apparatus, or
- pressure-demand, airline respirator (with escape bottle for IDLH or potential for IDLH atmosphere).

Chemical-resistant clothing (includes: overalls and long-sleeved jacket or hooded, one or two-piece chemical-splash suit or disposable chemical-resistant, one-piece suits)

Long cotton underwear*, or

Coveralls*

Gloves (outer), chemical-resistant

Gloves (inner), chemical-resistant

Boots (outer), chemical-resistant, steel toe and shank

Boot covers (outer), chemical-resistant (disposable)*

Hard hat (face shield*)

2-Way radio communications (inherently safe)

* Optional

2. Criteria for Selection

Meeting any one of these criteria warrants use of Level B protection:

The type and atmospheric concentration of toxic substances has been identified and requires a high level of respiratory protection, but less skin protection than Level A. These would be:

- Atmospheres with IDLH concentrations, but the substance or its concentration in air does not represent a severe skin hazard, or
- Chemicals or concentrations involved do not meet the selection criteria permitting the use of air-purifying respirators.

The atmosphere contains less than 19.5% oxygen.

It is highly unlikely that the work being done will generate high concentrations of vapors, gases or particulates, or splashes of material that will affect the skin.

Atmospheric concentrations of unidentified vapors or gases are indicated by direct readings on instruments such as the FID or PID or similar instruments, but vapors and gases are not suspected of containing concentrations of skin toxicants.

3. Guidance on Selection

- a. Level B does not afford the maximum skin (and eye) protection as does a fully encapsulating suit since the chemical-resistant clothing is not considered gas, vapor, or particulate tight.

However, a good quality, hooded, chemical-resistant, one-piece garment, with taped wrist, ankles, and hood does provide a reasonable degree of protection against splashes of liquids and lower concentrations of chemicals in the ambient air.

At most abandoned, outdoor hazardous waste sites, ambient atmospheric gas or vapor levels usually do approach concentrations sufficiently high to warrant Level A protection. In all but a few circumstances, Level B should provide the protection needed for initial reconnaissance.

Subsequent operations require a re-evaluation of Level B protection based on the probability of being splashed by chemicals, their effect on the skin, or the presence of hard-to-detect air contaminants. The generation of highly toxic gases, vapors, or particulates, due to the work being done, must also be considered.

- b. The chemical-resistant clothing required in Level B is available in a wide variety of styles, materials, construction detail, and permeability. One or two-piece garments are available with or without hoods. Disposable suits with a variety of fabrics and design characteristics are also available. Taping joints between hood and respirator reduces the possibility for splash and vapor or gas penetration, but is not a gas tight barrier.

These factors and other selection criteria all affect the degree of protection afforded. Therefore, a specialist should select the most effective chemical-resistant clothing based on the known or anticipated hazards and job function.

Level B equipment does provide a high level of protection to the respiratory tract. Generally, if a self-contained breathing apparatus is required, selecting chemical-resistant clothing (Level B) rather than a fully encapsulating suit (Level A) is based on the need for less protection against known or anticipated substances affecting the skin. Level B skin protection is selected by:

- Comparing the concentrations of known or identified substances in air with skin toxicity data.

- Determining the presence of substances that are destructive to or re-absorbed through the skin by liquid splashes, unexpected high levels of gases, vapor, or particulates, or by other means of direct contact.
- Assessing the effect of the substance (at its measured air concentrations or potential for splashing) on the small areas left unprotected by chemical-resistant clothing. A hooded garment, taped to the mask with boots and gloves taped to the suit, further reduces the area for potential skin exposure.

C. Level C Protection

1. Personal Protective Equipment

Air-purifying respirator, full-face, canister-equipped
(MSHA/NIOSH approved)

Chemical-resistant clothing (includes: coveralls or hooded, one-piece or two-piece chemical splash suit or chemical-resistant hood and apron; disposable chemical-resistant coveralls)

Coveralls*, or

Long cotton underwear*

Gloves (outer), chemical-resistant

Gloves (inner), chemical-resistant

Boots (outer), chemical-resistant, steel toe and shank

Boot covers (outer), chemical resistant (disposable)*

Hard hat (face shield*)

Escape mask*

2-Way radio communications (inherently safe)

*Optional

2. Criteria for Selection

Meeting all of these criteria permits use of Level C protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV) and the concentration is within the service limit of the canister.
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are a few ppms above background on instruments such as the FID or PID.

3. Guidance on Selection

- a. Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that atmospheric concentrations and other selection criteria permit wearing air-purifying respirators.

The air-purifying device must be a full-face respirator (MSHA/NIOSH approved) equipped with a canister suspended from the chin or on a harness. Canisters must be able to remove the substances encountered. Half-masks or cheek cartridge equipped, full-face masks should be used only with approval of a qualified health and safety professional, preferably a Certified Industrial Hygienist.

In addition, a full-face, air-purifying mask can be used only if:

- Substance has adequate warning properties.

- Individual passes a qualitative fit test for the mask.
 - Appropriate cartridge/canister is used, and its service limit concentration is not exceeded.
 - Site operations are not likely to generate unknown compounds or excessive concentrations of already identified substances.
- b. An air surveillance program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be thoroughly monitored when personnel are wearing air-purifying respirators. Periodic surveillance using direct-reading instruments and air sampling is needed to detect any changes in air quality necessitating a higher level of respiratory protection.
- c. Level C protection with a full-face, air-purifying respirator should be worn routinely in an atmosphere only after the type of air contaminant is identified, concentrations measured and the criteria for wearing an air-purifying respirator met. A decision on continuous wearing of Level C protection must be made after assessing all safety considerations, including:
- The presence of (or potential for) organic or inorganic vapors or gases against which a canister is ineffective or has a short service life.
 - The known (or suspected) presence in air of substances with low TLVs or IDLH levels.
 - The presence of particulates in air.
 - The errors associated with both the instruments and monitoring procedures used.
 - The presence of (or potential for) substances in air which do not elicit a response on the instrument used.
 - The potential for higher concentrations in the ambient

atmosphere or in the air adjacent to specific site operations.

- d. The continuous use of air-purifying respirators (Level C) must be based on the identification of the substances contributing to the total vapor or gas concentration and the application of published criteria for the routine use of air-purifying devices. Unidentified ambient concentrations of organic vapors or gases in air approaching or exceeding a few ppm above background require, at a minimum, Level B protection.

D. Level D Protection

1. Personal Protective Equipment:

- Coveralls
- Gloves*
- Boots/shoes, leather or chemical-resistant, steel toe and shank
- Safety glasses or chemical splash goggles*
- Hard hat (face shield*)
- Escape mask*

2. Criteria for Selection

Meeting any of these criteria allows use of Level D protection:

- No contaminants are present.
- Work functions preclude splashes, immersion, or potential for unexpected inhalation of any chemicals.

Level D protection is primarily a work uniform. It can be worn only in areas where there is no possibility of contact with contamination.

* Optional

NOTE: Levels C & D are the most common levels of protection used during GLNPO field operations.

III. Protection In Unknown Environments

In all incident response, selecting the appropriate personal protective equipment is one of the first steps in reducing health effects from toxic substances. Until the toxic hazards at an incident can be identified and personnel safety measures commensurate with the hazards instituted, preliminary safety requirements must be based on experience, judgment, and professional knowledge.

Of primary concern in evaluating unknown situations are atmospheric hazards. Toxic concentrations (or potential concentrations) of vapors, gases, and particulates, low oxygen content, explosive potential, and the possibility of radiation exposure all represent immediate atmospheric hazards. In addition to taking air measurements to determine these hazards, visual observation and review of existing data can help determine the potential risks from other materials.

Once immediate hazards, other than toxic substances, have been eliminated, the initial on-site survey and reconnaissance continues. Its purpose is to further characterize toxic hazards and, based on these findings, refine preliminary safety requirements. As data is obtained from the initial survey, the Level of Protection and other safety procedures are adjusted. Initial data also provide information upon which to base further monitoring and sampling requirements. No one method can determine a Level of Protection in all unknown environments. Each situation must be examined individually.

IV. Additional Considerations for Selecting Levels of Protection

Other factors which should be considered in selecting the appropriate Level of Protection are:

A. Heat and Physical Stress

The use of protective clothing and respirators increases physical stress, in particular, heat stress, on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or

more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly fitted hood against the respirator facepiece, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress. Whenever any chemical-protective clothing is worn, a heat stress recovery monitoring program must occur.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of selecting Level A protection should be balanced against the increased probability of heat stress and accidents. Level B and C protection somewhat reduces accident probability because the equipment is lighter, less cumbersome, and vision problems are less serious.

B. Air Surveillance

A program must be established for routine, periodic air surveillance when Level A & B situations are expected. Without an air surveillance program, any atmospheric changes could go undetected and jeopardize response personnel. Surveillance can be accomplished with various types of air pumps and filtering devices followed by analysis of the filtering media, portable real-time monitoring instruments located strategically on site; personal dosimeters, and periodic walk-through by personnel carrying direct-reading instruments.

C. Decision Logic for Selecting Protective Clothing

No adequate criteria, similar to the respiratory protection decision-logic, are available for selecting protective clothing. A concentration of a known substance in the air approaching a TLV or permissible exposure limit for the skin does not automatically warrant a fully encapsulating suit. A hooded, high quality, chemical-resistant suit may provide adequate protection. The selection of Level A over Level B is a judgment that should be made by a qualified individual (Certified Industrial Hygienist) considering the hazards and risk.

Hazards: The physical form of the potential contaminant must be considered. Airborne substances are more likely to contact personnel wearing non-encapsulating suits, which are not considered gas or vapor tight. Liquids contacting the skin are generally considered more hazardous than contact with vapors, gases and particulates.

Effect of the contaminant on skin:

- Highly hazardous substances are those that are easily absorbed through the skin causing systemic effects, or that cause severe skin destruction.
- Less hazardous substances are those that are not easily absorbed through the skin causing systemic effects, or that do not cause severe skin destruction.

Risk: Concentration of the contaminant: The higher the concentration, the higher the probability of injury.

Work function: Site work activities dictate the probability of direct and indirect skin contact.

Instability of the situation: A higher Level of Protection should be considered when there is a probability of a release involving vapor or gases, splashes or immersion in liquids, or through the loss of container integrity.

D. Atmospheric Conditions

Atmospheric conditions such as stability, temperature, wind direction and wind velocity, as well as barometric pressure, determine the behavior of contaminants in air or the potential for volatile material being released into the air. These parameters should be considered when determining the need for and Level of Protection required.

E. Work in the Exclusion Zone

For operations in the Exclusion Zone (area of potential contamination), different Levels of Protection may be selected, and various types of

chemical-resistant clothing worn. This selection would be based on measured air concentrations, the job function, the potential for skin contact or inhalation of the materials present, and ability to decontaminate the protective equipment used.

F. Escape Masks

Carrying an escape, self-contained breathing apparatus of at least five-minute duration, is optional while wearing Level C or Level D protection. For initial site entry, a specialist should determine, on a case-by-case basis, whether they should be carried, or be strategically located in areas that have higher possibilities for harmful exposure.

V. Vapor or Gas Concentrations As Indicated by Direct-Reading Instruments

Instruments such as the FID and PID can be used to detect the presence of many organic vapors or gases either as single compounds or mixtures. Dial readings are frequently referred to, especially with unidentified substances, as total vapor and gas concentrations (in ppm). More correctly, they are deflections of the needle on the dial indicating an instrument response and do not directly relate to the total concentration in the air.

Chapter 7 - MARINE SAFETY

7.1 SHIP OPERATION SAFETY

GLNPO research vessels shall be regularly inspected to minimize potential marine safety hazards. A formal inspection must be conducted on a monthly basis by GLNPO personnel who have a working knowledge of OSHA standards and regulations, as well as familiarity with marine safety operations. Research vessel operations shall be conducted in accordance with OSHA standards found in 29 CFR 1910 and 29 CFR 1926. A semi-annual inspection will be conducted by the Regional Health and Safety Manager. Inspection requirements appear in **Chapter 4** of this manual.

Overall standards for research vessel safety are discussed in the *Occupational Safety and Health Program for Employees Working Aboard the R/V Roger R. Simons and R/V Lake Guardian*, a document developed for the U.S. EPA by Seaward Services, Inc., of Ft. Lauderdale, Florida in June of 1990. A copy of this document is attached as **Appendix N** of this manual.

7.2 SHIP PERSONNEL SAFETY

All personnel aboard GLNPO research vessels will be required to comply with the health, safety, and environmental regulations in accordance with the Environmental Health and Safety Compliance Manual for U.S. EPA GLNPO Vessels. Research vessel employees will be trained in the areas of health, safety, environmental compliance, and fire prevention. Training requirements appear in **Chapter 2** of this manual.

In addition to the requirements specified in the Environmental Health and Safety Compliance Manual for U.S. EPA GLNPO Research Vessels, health and safety protocols are also specified in **Appendix O**, *Health and Safety Protocols for EPA Vessels*, and in **Appendix P**, *Safety and Emergency Manual, Basic Shipboard Emergencies and Crew Responsibilities*. The requirements specified in these two documents are designed to enhance the overall health, safety, and environmental compliance program for GLNPO research vessel operations.

7.3 NEW EMPLOYEE ORIENTATION

GLNPO research vessel laboratory personnel are required to receive laboratory safety orientation training. The safety orientation will contain rules for safe operations in laboratories, fire evacuation and alarm locations, waste disposal, spill control stations, personal protective equipment, and location of eyewashes.

GLNPO research vessel personnel not working in laboratory areas will also be required to receive safety orientation training. The safety orientation will include general safety rules, fire evacuation plans and emergency response procedures, and exposure to potential hazards. Training requirements are detailed in **Chapter 2** of this manual.

7.4 FIRE SAFETY

All occupants aboard GLNPO research vessels are required to participate in fire safety training exercises and drills. All personnel are expected to be familiar with the operational procedures identified in the Occupant Emergency Plan developed for the vessel. The Occupant Emergency Plan appears as **Appendix M** of this manual.

7.5 FIRST AID AND CPR

First Aid/CPR training and certification is required for specific personnel who work aboard all GLNPO research vessels. For specific training requirements in First Aid and CPR, refer to **Chapter 2.1.3**.

7.6 OCCUPANT EMERGENCY PLAN

The Federal Government is responsible for minimizing danger to life and property arising from the effects of bomb threats, bombs, enemy attack, fire, explosion, earthquake, serious weather disturbance, civil disturbance, and other disasters affecting federal property. In response to this, the General Services Administration requires the development of an Occupant Emergency Plan. The Occupant Emergency Plan for GLNPO research vessels appears as **Appendix M** of this manual.

7.7 CONFINED SPACE ENTRY

Confined Space Entry Policies and Procedures for GLNPO personnel are detailed in **Chapter 2** and **Appendix E** of this manual.

7.8 VISITOR SAFETY

From time to time, GLNPO research vessels will conduct "open houses" where visitors may board and tour the vessels. During these times, research vessel personnel will be responsible for the health and safety of the visitors. For vessel-specific visitation policies, please refer to **Attachment 7.1** of this chapter. Visitor evacuation procedures and visitor security procedures can be found in **Chapter 8, Sections 8.5. and 8.6**, respectively.

Attachment 7.1 VISITOR SAFETY

GLNPO research vessel visitation policies and procedures require that ship's communications equipment remain active to allow contact with local emergency services. Personnel/visitor watches will be established at the following locations:

- Aft main deck (fantail)
- Multi-purpose (wet) lab (scientist)
- Main deck lounge/galley
- Aft focsle deck
- Bridge deck/bridge

All personnel/visitor watches will prevent visitors from entering restricted areas and/or engaging in unsafe or inappropriate behavior. In the event of a fire or other alarm, the watches must direct visitors to the nearest safe exit leading to the gangplank. A maximum of 25 visitors will be allowed on board at any one time. The aft main deck watch will monitor the number of visitors boarding and leaving the vessel.

No occupied wheelchairs, baby carriages or strollers will be permitted on the gangplank or inside the ship. Such items may be stowed on the fantail for safe keeping during a visit. Handicapped visitors will be told of the physical difficulties they will encounter aboard ship, but will not be denied entry if they are capable of boarding and/or have assistance. Persons of impaired capacity, such as to be a risk to themselves or others, will be denied entry. High heels and cowboy boots are discouraged in order to protect the deck. Uncooperative visitors will be reported to the Captain (1st or 2nd Mate) who will escort the visitor(s) ashore. Group tours (schools) will be allowed aboard in subgroups of no more than 25.

Access to the gangway will be promptly restricted at closing time. Visitors will be informed of the closing time during the last hour of the tour. The fantail watch will remain on duty to assist all guests departing the ship. After visiting hours, personnel/visitor watches must tour their assigned decks to ensure that all guests have safely left the vessel.

Chapter 8 - EMERGENCY PREPAREDNESS AND RESPONSE

OVERVIEW

It is the policy of GLNPO to comply with all applicable federal, state and local regulations regarding emergency preparedness and response. This policy is not limited to hazardous material spills or the transportation of hazardous materials, but extends to firefighting operations, contractor support operations, as well as evacuation plans and security procedures for "open houses" aboard research vessels.

8.1 HAZARDOUS MATERIAL SPILLS -RCRA, OSHA

In the event of a hazardous material spill the Hazardous Waste Contingency Plan will be implemented immediately. The contingency plan contains specific procedures to be carried out in the event of a release. An example of a Hazardous Material Contingency Plan for GLNPO can be found as **Appendix R** of this manual.

8.2 HAZARDOUS MATERIAL TRANSPORTATION

It is the policy of U.S. EPA Region V to comply with all applicable regulations when transporting hazardous materials by government vehicle. **Appendix S** of this manual, entitled *Procedures for the Transportation of Hazardous Materials/Waste by Great Lakes National Program Office VIA Government Vehicle and Government Driver*, details necessary regulations and appropriate packaging for the transportation of hazardous materials. GLNPO will comply with the regulatory and policy requirements specified within this document.

8.3 FIRE FIGHTING OPERATIONS

Fire prevention programs must be established in all GLNPO facilities and aboard all research vessels to reduce the possibility of fire. If a fire does occur, well-developed fire fighting procedures will be implemented. Aboard research vessels, the captain is in charge of fire prevention and protection. He will establish inspection schedules, provide recordkeeping, and ensure that all fire fighting equipment is properly inspected and in working order. Fire equipment

inspections will include such items as fire pump operation, fire hydrants, sprinkler systems, water supply, portable fire extinguishers, fire doors, exits, and detectors. A research vessel fire inspection program is described in **Chapter 4** and **Attachment 4.1** of this manual.

Response teams will be available 24-hours a day and regularly scheduled training for all members of the team will be conducted. At least one hour a week will be scheduled for a response training session. These sessions will include proper procedures on how to avoid fire, hands-on training for drills including signals and individual responsibilities, as well as procedures for the prevention of bodily injury. A portion of this training will be devoted to the practice of emergency exit drills to ensure that all exits are clearly marked, easily passable, and that all alarms are in working order. Any deficiencies noted during drills or regular inspections will be corrected immediately.

Emergency signal instructions and personnel assignments for research vessels are contained in the "Station Bill" which appears as **Attachment 8.1** of this chapter. An operational diagram for research vessels appears as **Attachment 8.2** of this Chapter.

8.4 CONTRACTOR SUPPORT OPERATIONS

All outside contractors will comply with health, safety, and environmental policies according to Federal, State, and Local regulations.

8.5 EVACUATION PLAN FOR VISITORS ABOARD RESEARCH VESSELS DURING AN OPEN HOUSE

In the event of a fire or other alarm incident during open house, the Personnel/Visitor watches must direct visitors to the nearest safe exit leading to the gangplank. The watch must then proceed with response activities.

8.6 SECURITY ABOARD RESEARCH VESSELS DURING AN OPEN HOUSE

Prior to an open house, a "Pre-open House Check List" will be completed to ensure that the ship is safe and secure for visitors to come aboard. The checklist appears as **Attachment 8.3** of this chapter. Also, during an open house, vessel personnel will be assigned to a personnel/visitor watch at designated locations throughout the ship. The personnel/visitor watch will prevent visitors from

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entering restricted areas as well as monitor and prevent unsafe activity. Uncooperative visitors will be reported to the Captain (1st or 2nd Mate) who will escort the visitor ashore.

Attachment 8.1 – STATION BILL

SIGNALS

FIRE AND EMERGENCY- Rapid ringing of the ship's bell and continuous ringing of general alarm bells for a period of at least 10 seconds.

ABANDON SHIP - More than 6 short blasts and 1 long blast on the whistle and the same signal on the general alarm bells.

MAN OVERBOARD - Hail, and pass the word "Man Overboard" to the bridge.

DISMISSAL - From FIRE AND EMERGENCY stations, 3 short blasts on the whistle and 3 short rings on the general alarm bells.

INSTRUCTIONS

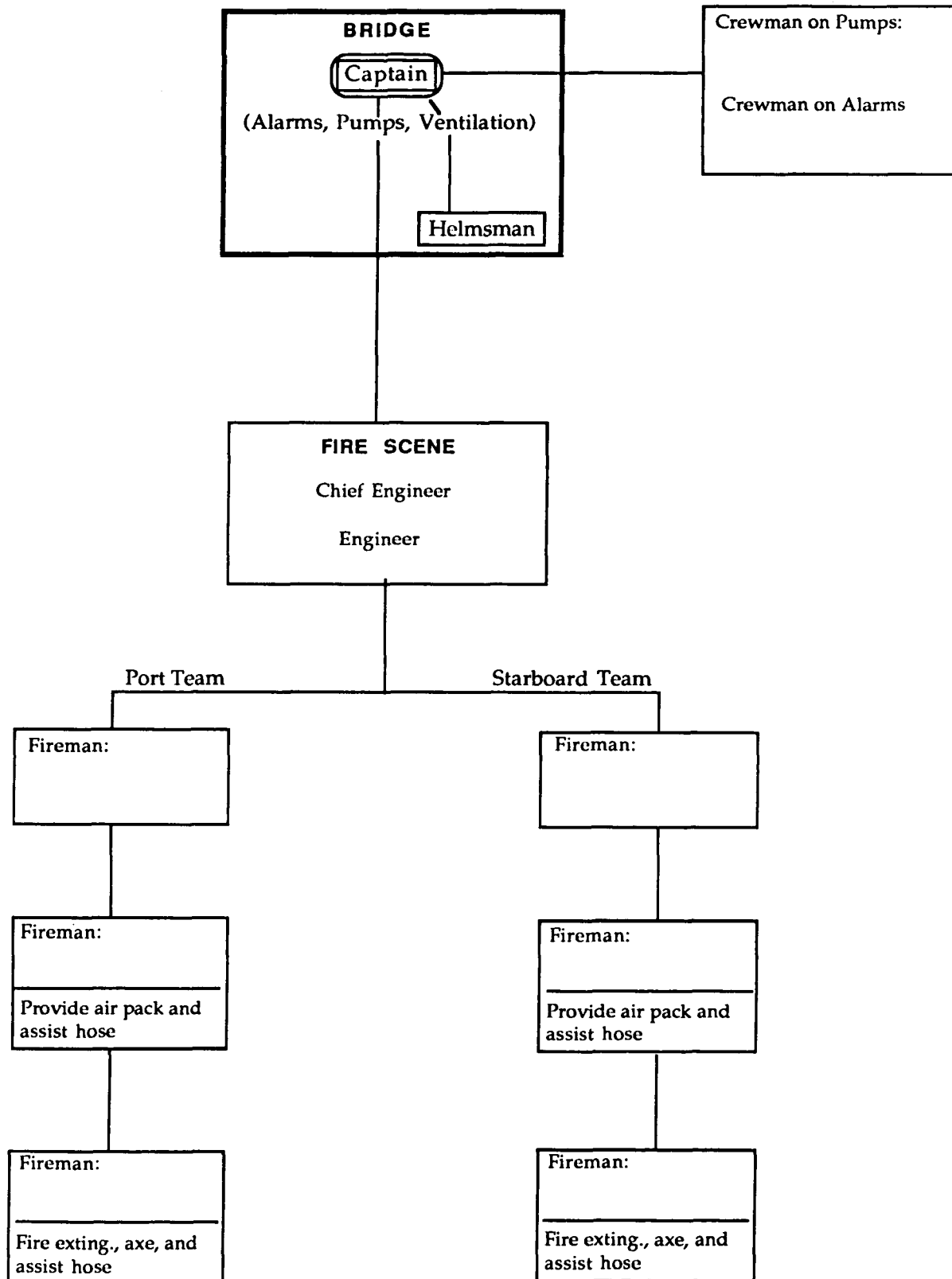
1. Immediately upon reporting on board, the entire crew shall familiarize themselves with the location of their emergency stations and the specific duties required at that station.
2. Each crew member shall be provided with an individual supplementary station bill card which must show, in detail, the special duties to be performed.
3. The entire crew shall be instructed in the performance of their special duties and the crew on watch will remain prepared to receive the signal for an emergency drill.
4. Every person participating in the abandon ship drill will be required to wear a life preserver. The entire boat crew shall assist in removing the chain rails.
5. Immediately upon receiving the emergency signal, the Emergency Squad will assemble with the appropriate equipment at the scene of action.
6. The Steward's department will assemble and direct passengers who are

properly dressed and wearing life preservers to embarkation stations.

7. The first person to discover a fire shall immediately notify the bridge and fight the fire with available equipment.
8. Immediately upon receiving the FIRE AND EMERGENCY signal, fire pumps will be started, all watertight doors, ports, and air shafts will be closed, and all fans and blowers stopped. The fire hose will be deployed in the affected area.
9. Upon hearing the signal, "MAN OVERBOARD", life ring buoys will be thrown overboard, the engines stopped, and a lookout sent aloft. The Emergency Boat Crew shall immediately clear the rescue boat for launching.
10. During periods of low visibility, all watertight doors and ports below the bulkhead deck shall be closed, subject to the Master's orders.

CREW ASSIGNMENTS DURING FIRE, EMERGENCY AND ABANDON SHIP INCIDENTS

<u>NO.</u>	<u>RATING</u>	<u>FIRE & EMERGENCY STATIONS</u>	<u>ABANDON SHIP-LIFERAFT STATIONS</u>
1	Master	On Bridge-In Overall Command Emergency.	In Command-Provide Nav.
2	Chief Mate	At Scene, in Charge-Assist Firemen	Launch Raft-Provide Compass
3	Second Mate	Provide Fog Applicator-Assist Firemen	Launch Raft-Provide Hand Held
4	Chief Engineer	Engineroom - Start Fire Pump	Launch Raft
5	Asst. Engineer	Engineroom - Assist Chief as Directed	Assist Launching of Raft
6	Electrician	Make Ready Portable Fire Pump- Assist	Direct Personnel to Rafts 1 & 3
7	Able Seaman	At Scene-Provide Extinguisher & Axe	Assist Launch or Raft
8	Able Seaman	At Scene-Provide SCBA, Man Hose	Launch Raft
9	Ord. Seaman	On Bridge-At Helm	Direct Personnel to Rafts 2 & 4
10	Cook	At Scene-Provide Air Pack, Man Hose	Provide First Aid Kit
11	Steward	At Scene-Provide Extinguisher, Assist	Provide Blankets
12	Elect. Tech.	Man Portable Fire/De-watering Pump	Assist Launch of Raft
13	Marine Tech.	At Scene-Don Firesuit, Man Hose	Assist Launch of Raft
14	Chief Scientist	O-2 Deck Aft-Muster Scientists	O-2 Deck Aft-Muster Scientists
15	Scientist	O-2 Deck	O-2 Deck
16	Scientist	O-2 Deck	O-2 Deck
17	Scientist	O-2 Deck	O-2 Deck
18	Scientist	O-2 Deck	O-2 Deck
19	Scientist	O-2 Deck	O-2 Deck
20	Scientist	O-2 Deck	O-2 Deck
21	Scientist	O-2 Deck	O-2 Deck
22	Scientist	O-2 Deck	O-2 Deck
23	Scientist	O-2 Deck	O-2 Deck
24	Scientist	O-2 Deck	O-2 Deck



Attachment 8.3 - PRE-OPEN HOUSE CHECK LIST FOR R/V LAKE GUARDIAN

✓ Yes or No

Preliminary:

Y N

- ☐ ☐ Visitor (school, press, VIP) schedule review by tour guide.
- ☐ ☐ Sanitary holding tank low enough to preclude drain back-up in wet lab floor.
- ☐ ☐ Pedestrian walkways and water-edge railings adequate.
- ☐ ☐ Mooring lines not obstructing walkway.

Boarding Area:

Y N

- ☐ ☐ Welcome sign, times and dates.
- ☐ ☐ Welcome sign secure.
- ☐ ☐ Trash can available ashore.
- ☐ ☐ Gangplank - on-shore step.
- ☐ ☐ Gangplank secured against lateral movement.
- ☐ ☐ Gangplank - railings.
- ☐ ☐ Gangplank - walk surface.

Main Deck Aft:

Y N

- ☐ ☐ Gangplank access aboard unobstructed.
- ☐ ☐ Removable gate railing secured against falling.

Y N

- ☐ ☐ Fantail deck cleared of loose equipment and oil spills.

- ☐ ☐ Knuckle crane secured and off.
- ☐ ☐ Aft A-frame secured and off.
- ☐ ☐ Starboard A-frame and winch secured and off.
- ☐ ☐ Engine room hatch closed.
- ☐ ☐ Main deck starboard side at rear of containers taped against entry.
- ☐ ☐ Main deck port side clear of obstructions.
- ☐ ☐ Boat hook available under aft container lab.
- ☐ ☐ Life rings in place - fantail.
- ☐ ☐ Counting device in place (may need a second one to count visitors disembarking).
- ☐ ☐ Guide to R/V Lake Guardian tour brochures and stickers at hand on deck.

Container Labs:

- Y N
- ☐ ☐ Aft sea door open.
 - ☐ ☐ Hazardous Materials Container locked (lights on?).
 - ☐ ☐ Container labs cleared of hazardous materials, lights on, doors open but taped to prevent entry.

Wet Lab:

- Y N
- ☐ ☐ Port sea door open.
 - ☐ ☐ Wet lab lights on.
 - ☐ ☐ Video tape rewound, brochures, guest book and pen, press kits ready.
- Y N
- ☐ ☐ File drawers closed/locked.

- ☐ ☐ All counters cleared of chemicals, samples, glass, except for display/demonstration items.
- ☐ ☐ Floors clear of slip/trip hazards.
- ☐ ☐ Refrigerator clear of hazardous materials and locked.
- ☐ ☐ Hood cleared out and closed.
- ☐ ☐ Non-potable water turned off.
- ☐ ☐ Hazardous material drains closed.
- ☐ ☐ Computer off or set to prevent tampering; all disks secure.
- ☐ ☐ Pilferable items stowed.
- ☐ ☐ Posters in place.
- ☐ ☐ Double sea doors open.
- ☐ ☐ Rosette sensors/controls off and secured
- ☐ ☐ Rosette lowered to rack (winch controls off and secured).
- ☐ ☐ A-frame secured and off.
- ☐ ☐ Gunwale safety chain in place.
- ☐ ☐ Sampling deck taped against entry (we need a chain here).
- ☐ ☐ Equipment displays in place.

Passageway:

- Y N
- ☐ ☐ Both hallway aft sea doors open.
 - ☐ ☐ Walk-in refrigerator locked.
- Y N
- ☐ ☐ Exercise room locked.

- ☐ ☐ Posters in place.
- ☐ ☐ Chem. lab cleared of hazardous material, lights on, doors open, taped against entry.
- ☐ ☐ Bio lab cleared of hazardous material, green lights on, doors open, taped against entry.
- ☐ ☐ Hall fire door closed, sign saying "Entry Permitted".
- ☐ ☐ Lab office door locked (due to hit/strike hazard of fire door opening into a person entering/leaving lab office).
- ☐ ☐ Scientist cabin, clean, no valuables/pilferables, open without taping, (If occupied, should be locked).
- ☐ ☐ Restrooms clean, lights on, toilet paper and paper towels available.
- ☐ ☐ Starboard equipment/utility room locked.
- ☐ ☐ Laundry room clean; no filled laundry baskets, lights on, door open.

Galley/Lounge:

Y N

- ☐ ☐ Video tape rewound.
- ☐ ☐ Water fountain clean.
- ☐ ☐ Refrigerators locked.
- ☐ ☐ All food stuffs put away.
- ☐ ☐ Paper cups put away.
- ☐ ☐ Soda dispenser turned off.
- ☐ ☐ Storage cabinets locked.

Y N

- ☐ ☐ Floors clean.
- ☐ ☐ Engine room door closed, "No Entry" sign in place.

Focsle Deck:

Y N

- ☐ ☐ Passageway lights on.
- ☐ ☐ Forward two fire doors closed, "Entry Permitted" signs in place.
- ☐ ☐ Mechanical room door locked.
- ☐ ☐ Crew's quarters locked.
- ☐ ☐ Office locked.
- ☐ ☐ All occupied EPA and Scientist quarters locked.
- ☐ ☐ Two vacant quarters open, lights on, pilferable articles stowed.
- ☐ ☐ Water fountain clean.
- ☐ ☐ Sheath on fire ax pick.
- ☐ ☐ Aft door latched open, weather permitting.
- ☐ ☐ Focsle aft deck clear of trip/slip hazards.
- ☐ ☐ Winches secure and covered.
- ☐ ☐ Access to container tops taped to prevent entry.
- ☐ ☐ Both paint lockers closed and locked.
- ☐ ☐ Bow deck taped to prevent access to anchor equipment.

Bridge Deck:

Y N

- ☐ ☐ Dog house locked.
- ☐ ☐ Battery racks secured against jettison.
- ☐ ☐ Inflatable boat cover secure.
- ☐ ☐ Trip hazards in area of boat davits marked with warning tape.

- ☐ ☐ Safety chain at boat davit gunwale in place.
- ☐ ☐ Ladders marked with warning tapes to prevent access to rigging.
- ☐ ☐ Both emergency gear (SCBA, etc.) lockers closed, but not locked, and taped against access.
- ☐ ☐ Radar turned off and secure.
- ☐ ☐ Wing bridges off, secure and covered.

Bridge:

Y N

- ☐ ☐ Bridge doors unlocked and open, weather permitting.
- ☐ ☐ Pilferable bridge items stowed.
- ☐ ☐ Rudder controls off and secure.
- ☐ ☐ Cellular phone activated and/or shore telephone located.

Personnel:

Y N

- ☐ ☐ EPA and Crew visitor duty station.
- ☐ ☐ Gangplank Ashore: seaman (optional).
- ☐ ☐ Fantail/gangplank: seaman.
- ☐ ☐ Wet Lab: contractor or EPA Scientist and Public Affairs.
- ☐ ☐ Lounge: seaman (optional).

Y N

- ☐ ☐ Focsle aft deck: seaman.
- ☐ ☐ Bridge Deck: seaman (optional).
- ☐ ☐ Bridge: Ship's Officer.

- ☐ ☐ School Tour Guide: Science Representative.
- ☐ ☐ Press (et al) Host: Science Representative/Public Affairs.
- ☐ ☐ EPA Science Representative.

After Tour:

Y N

- ☐ ☐ Check all decks and unlocked spaces for stragglers/stowaways/damage.
- ☐ ☐ Close gangway.
- ☐ ☐ Change welcome sign, time, date.
- ☐ ☐ Enter visitor count in log.
- ☐ ☐ Rewind video tapes.

Chapter 9 - ENVIRONMENTAL COMPLIANCE

Executive Order 12088, signed by President Jimmy Carter in 1978, requires Federal Agencies to comply with all requirements of federal, state, and local environmental regulations. As such, EPA Regions must comply with these regulations concerning air, water, hazardous and nonhazardous waste, toxic substance control, emergency planning, and community right-to-know. Additionally, all U.S. EPA employees, including U.S. EPA contractors, as well as their representatives, are required to act in an environmentally responsible manner to protect themselves, the public, and the environment.

Acting in accordance with Executive Order 12088, each department and division of the U.S. EPA is required to establish practices and procedures which comply with these regulatory requirements as they relate to individual U.S. EPA work operations. As a division of U.S. EPA Region V, GLNPO and GLNPO research vessels must have well established programs for ensuring compliance with federal, state, and local regulations regarding releases of hazardous and non-hazardous substances into the environment. GLNPO personnel, therefore, must comply with the regulations detailed in the Toxic Substance Control Act and the Resource Conservation and Recovery Act and understand how these regulations affect their work operations.

9.1 TSCA - PCBs

The Toxic Substance Control Act (TSCA) primarily applies to manufacturers, distributors, processors, and importers of chemicals. This law specifically bans the manufacture of polychlorinated biphenyls (PCBs). All federal facilities, however, who use or dispose of any PCB items are subject to TSCA regulations specified in Section 6 of the TSCA regulations as they appear in 40 CFR Part 761. Since GLNPO research laboratories and vessels use and dispose of samples, standards, and stock solutions containing PCBs, they are required to comply with TSCA through proper PCB labeling, storage, dilution, spill cleanup, and disposal.

9.2 RCRA

The Resource Conservation and Recovery Act (RCRA) of 1976 was enacted to ensure proper identification, reporting, transporting, storage, and disposal of

hazardous and non-hazardous solid waste. Section 6001 of RCRA requires that all Federal Agencies be in compliance with this act. In the case of non-hazardous solid waste, Federal facilities are required to comply with the regulations specified in 40 CFR Parts 240-249. For hazardous solid waste, Federal agencies are required to comply with the regulations specified in 40 CFR Parts 260-272.

9.2.1 SOLID NON-HAZARDOUS WASTE HANDLING, STORAGE, AND DISPOSAL

GLNPO facilities and research vessels generate three profiles of non-hazardous solid waste. These waste profiles are considered as 1) trash designated for a land disposal facility, 2) broken glassware, and 3) recyclable cans and paper. GLNPO facilities and research vessels must, therefore, dispose of their non-hazardous solid waste in compliance with 40 CFR Parts 240-249. These regulations specifically relate to regulatory compliance by the waste disposal facility and to recycling.

Trash Designated for a Land Disposal Facility

Trash that cannot be recycled must be placed in garbage cans conveniently located throughout GLNPO office facilities and on board GLNPO research vessels, including laboratory areas. Examples of such trash include laboratory towels, labware (excluding glass) that is not contaminated, and solid samples that are not designated as hazardous waste.

Recyclable Waste

GLNPO personnel, as well as GLNPO contractors, are required to participate in a recycling program for newspapers, white paper, uncontaminated glassware and aluminum cans. Broken, uncontaminated glassware is also considered recyclable. Recycling containers, such as trash cans, must be conveniently located throughout GLNPO offices and research vessels.

Hazardous Waste

As amended, RCRA regulates the generation, treatment, storage, and disposal of hazardous waste from "cradle to grave" and all Federal agencies are required to comply with these regulations as they appear in 40 CFR Parts 260-272. Individual states, however, are authorized to operate hazardous waste disposal programs in lieu of the federal program. Based on this authorization, GLNPO facilities and GLNPO research vessels are required to comply with State regulations when

disposing of hazardous waste.

Waste Minimization

GLNPO facilities and research vessels are specifically encouraged to minimize hazardous waste generation where possible. Minimizing the generation of hazardous waste reduces potential hazards to employees, the public, and the environment.

Training

Federal and State regulations require annual training for personnel who will be generating, handling, and disposing of hazardous waste. GLNPO is required to provide this initial training to personnel whose work operations involve hazardous waste. The training must be designed to familiarize personnel with hazardous waste handling procedures and emergency response actions. Annual refresher training must be provided thereafter.

9.3 DRINKING WATER

The U.S. EPA requires that EPA facilities monitor drinking water for lead and copper levels. If these levels reach or exceed the action level, then appropriate action must be taken. GLNPO complies with this policy through the monitoring of drinking fountains and sink faucets, and bottled water used as sources of drinking water in GLNPO facilities and aboard GLNPO research vessels.

9.4 GLNPO ENVIRONMENTAL COMPLIANCE MANUAL

GLNPO facilities and GLNPO research vessels are committed to complying with all applicable rules and regulations in an effort to serve as a model to other U.S. EPA programs in the areas of environmental health and safety. GLNPO has developed an environmental compliance manual which outlines environmental compliance strategies and procedures to ensure that health and safety is a constant and consistent priority in the work operations at GLNPO facilities and aboard GLNPO research vessels. This environmental compliance manual appears as **Appendix T** of this manual.

9.5 AIR EMISSIONS AND TOXICS

Rules and regulations pertaining to air emissions and toxics are specified in **Appendix T, Chapter 2, *Air***.

9.6 INDOOR AIR QUALITY

Indoor air quality measurements and surveys are conducted as part of the annual industrial hygiene survey for GLNPO research vessel laboratories and work areas. Reports of findings are provided to the U.S. EPA Region V Safety and Health Manager, and any deficiencies are corrected under his direction.

9.7 ASBESTOS PRECAUTIONS

The U.S. EPA National Policy Statement for Asbestos-Containing Materials (No. SHEMD-92-001) specifies the requirements for the identification and management survey of asbestos-containing materials in U.S. EPA facilities. Depending on asbestos survey results for GLNPO facilities and research vessels, an Operations and Maintenance Plan may be developed to address management of asbestos-containing materials in accordance with SHEMD policy.

The policy and Standard Operating Practices used in the SHEMD plan were developed through the Safety, Health, and Environmental Management Divisions National Technical Services Center, using the "Policy and Standard Operating Practices Manual for the Management of Asbestos-Containing Building Materials at EPA Facilities" (Third Draft, March 1992).

Asbestos surveys will be performed for all GLNPO facilities and research vessels in accordance with SHEMD-92-001. Results of inspections for specific facilities and vessels are located in **Appendix U** of this manual.

Chapter 10 HEALTH AND SAFETY PROCEDURES DURING GLNPO SEDIMENT SAMPLING OPERATIONS

10.1 BACKGROUND

The Sediment Assessment Program is designed to sample and evaluate areas of sediment where the possibility of contamination exists. During sampling, field specialists and laboratory analysts may be exposed to sediment which represents a chemical or biological hazard. Therefore, the potential for exposure should always be of foremost concern when handling sediments of unknown contamination.

GLNPO sediment sampling activities are grouped into the following five categories:

1. Sediment sampling at each ARCS
2. Tributary sediment monitoring
3. Open lake sediment monitoring
4. Support for EPA regions for Superfund and enforcement activities
5. Miscellaneous activities

Sediment assessment and tributary monitoring may entail collecting long core and grab samples with low to high amounts of contamination. Typical ARC assessments span six to twenty days. Operation of all R/V *Mudpuppy* equipment is usually necessary. Open lake sediment monitoring is generally conducted aboard the R/V Lake Guardian and involves the use of heavier equipment where the captain is responsible for navigation and positioning of the vessel.

Sediment sampling to support EPA regional offices or other governmental agencies provides the largest degree of diversity in sampling activities. Sampling operations range from use of all or part of the R/V *Mudpuppy* equipment to field-flexible sampling plans based on observations of samples and/or their environments. Most of GLNPO's sediment sampling activities, however, will be performed on board the R/V *Mudpuppy* either on an outdoor work bench or in a mobile laboratory. Refer to **Appendix O** of this manual for safety protocols for the R/V *Mudpuppy*.

Sampling aboard the R/V *Mudpuppy* will include one U.S. EPA/GLNPO technical individual and two contractors. Personnel will have experience in the operation of small craft vessels, as well as in the use of sampling equipment.

Additional staff may participate in sediment sampling activities provided they meet the training requirements described in the GLNPO safety manual.

10.2 SAFETY

Prior to commencing field operations, the field team should gather all site data available and assess the anticipated hazard level of sediments to be sampled. When assessing the sediments' hazard potential for a site, the depth sampled below the surface must always be considered. For example, if all historical data available for a site comes from Ponar dredged samples, all samples collected below the sampling depth of the Ponar should be treated as unknown and potentially hazardous. Refer to **Appendix A** and **Appendix I** of this manual for additional information regarding Respiratory Protection and Personal Protective Equipment.

A. Personal Protection

This section examines the procedures that will be implemented by all personnel working with contaminated sediment. It should be noted that research conducted with sediment varies considerably depending on the scope and objective of the research. Therefore, the guidelines set forth in this SOP may not be applicable to all situations dealing with potentially contaminated sediments.

1. **Medical Surveillance.** Health monitoring will be provided for personnel working with sediments. Health monitoring establishes a baseline to which all subsequent medical monitoring can be compared. All field and laboratory personnel must be monitored prior to working with any sediments.
2. **Personal Precautions.** Workers must always be aware of possible points of contamination as described by the supervisor. Hands should always be kept away from the eyes and mouth. After completion of a manipulation involving sediment or the removal of potentially contaminated laboratory clothing (gloves, lab coat, etc.), the hands, forearms, and other areas of possible contact should be washed with hand soap and water at a sink located in the laboratory work area or on board the collection vessel. Do not use organic solvents to clean the skin. These solvents may increase penetration of the contaminant into the skin.

3. **Laboratory Clothing.** When working with sediments, it is of the utmost importance to avoid skin contact. A fully fastened, knee-length lab coat must be worn in the laboratory work area at all times. Disposable Tyvec® lab clothing must be worn for sediment manipulation. During field operations, disposable Tyvec® or Saranac suits must be worn by all personnel who may have possible contact with the sediment. Cloth lab clothing may be worn during non-hazardous activities such as feeding test organisms, entering data, or checking diluters. Any laboratory clothing with holes or tears will not be used. The lab coat must be removed and stored in the laboratory work area. All lab clothing must be handled while wearing gloves. The procedure for donning gloves and a lab coat is as follows: (a) put on one pair of clean gloves, (b) put on the lab coat, and (c) put on a second pair of gloves. The procedure for removing the gloves and lab coat is: (a) remove the outer pair of gloves making sure not to contact the skin with the surface of the outer glove, (b) remove the lab coat, (c) remove the second pair of gloves, and (d) wash hands at the sink. Clothing should be examined, daily, for possible contamination.
4. No shorts or skirts are to be worn in the laboratory when working with hazardous materials.
5. **Hand Protection.** Hands will be the most frequent point of potential contact with contaminants. Gloves must be worn to avoid skin contamination. Disposable gloves must be discarded after each use in appropriate containers designated for this use. Double gloves will be used with the outer glove being stripped off after any potential exposure. Torn or punctured gloves must be discarded and replaced immediately. Rubber, latex or vinyl gloves do not provide full protection. Contaminants may diffuse into the gloves. When sediment is handled, gloves should be changed frequently. Cuffs must be tight fitting or taped to the sleeve to prevent inward migration of contaminants.
6. **Eye Protection.** Safety glasses must be worn at all times. In addition, face shields will be made available in the laboratory work area. On deck, face shields will be required when hauling coring equipment and sediment cores until the sediment is extruded from the core tube and deemed, when possible, non-hazardous.
7. **Further Precautions.** Protective disposable footwear is

recommended during sediment manipulation. Long hair should be tied back and loose clothing should be covered by the lab coat. Eating, drinking, smoking, chewing gum, and smokeless tobacco are prohibited in the laboratory work area. Oral pipetting will never be performed. In addition, respirators, a vented hood, or ventilated work area will be used when sediment is manipulated. Respirators will be labeled with the worker's name, date of filter replacement, and stored in an appropriate manner when not in use. Reusable protective gear will be stored in the laboratory work area.

B. Facility Engineered Protection

The following guidelines are for the laboratory work area where sediments will be tested.

1. Area identification and access control.
 - a. The laboratory work area where sediments are used or stored will be properly identified. Access to the designated laboratory work area will be limited. Laboratory doors will be kept closed.
 - b. Animals and plants not related to the analytical procedure shall not be permitted in the laboratory.
2. Eyewash stations and hand washing facilities are available in the laboratory work area.
3. Contaminant Devices. Work with sediment will be performed in an appropriate containment device. Procedures involving sediment will not be conducted on an open bench due to the potential hazard for generating contaminated dusts, aerosols, or fumes. Hoods and ventilated work areas are used to minimize the worker exposure to contaminants associated with sediment. All containment devices will be constructed out of smooth, unbreakable material, such as Teflon®, stainless steel, polyethylene, fiberglass, or plexiglass. Exhaust air from hoods or a ventilated work area does not have to be filtered but it must be discharged out of the building, as far from the air intake supply as possible.
4. Equipment. Use of instruments such as pH, dissolved oxygen or conductivity meters will be used in a ventilated work area or hood.

This equipment will be enclosed in plastic to reduce the potential for contamination or kept outside the hood on a lab cart. Instruments will be serviced or calibrated in the work area. All calibration and maintenance log books should be kept with the equipment. All equipment that has come in contact with potentially contaminated sediment must be kept either under negative pressure (e.g., a hood) or sealed in an air-tight container (e.g., a Tupperware container) before it is cleaned.

5. **Work Surfaces.** All laboratory work surfaces potentially exposed to hazardous sediments must be covered with Teflon® sheets, plastic trays, dry absorbent plastic-backed paper, foil, or other impervious or disposable material. If a surface becomes contaminated or a spill occurs, the work surface should be decontaminated or disposed of immediately.
6. **Housekeeping.** The laboratory work area shall be kept clean and orderly. Clean up shall follow every operation or, at a minimum, at the end of each day. Containers for disposal of contaminated materials will be placed in the work area.
7. **Spill Control.** A hazardous sediment spill will be treated as a "Chemical Spill": Organic Solvent". The sediment spill will be contained with the appropriate absorbent material. If a spill occurs, the worker should (a) pour absorbent material on the spill quickly, using enough material to absorb all fluid and cover the mass with excess dry absorbent to control vapors; (b) sound the air horn to signal for help if necessary; (c) if problems are encountered in containing the spill, consideration should be given to evacuating the building, routing personnel away from the problem area; (d) clean up absorbents and dispose of them properly as hazardous waste; (e) when safe, allow personnel to return to the laboratory work area.

10.3 STORAGE OF SEDIMENT

Solid-phase sediment and sediment extracts will be stored at 4°C in air-tight containers in the dark. Proper identification and sample tracking information must accompany all samples. Sediment extracts can be temporarily stored at 4°C in designated lab refrigerators. On board, sediment samples are stored inside coolers in either capped core tubes or in sample containers. All samples are to be transported from the refrigerator to work area on a lab cart in sealed containers.

Sediment will always be transferred using double containment. Transfer of sediment from the storage container is a procedure which involves a potential hazard for personal contamination. During this procedure, the number of investigators in the laboratory work area should be kept to a minimum.

10.4 HOMOGENIZATION AND PREPARATION OF ELUTRIATE SAMPLES

Mixing and sampling of solid-phase sediment or sediment extracts will be done in the original storage container under a hood. If the containers holding sediment are removed from the hood, an intermediate non-breakable container must be used. The worker must use a respirator with organic vapor-acid gas filters and appropriate clothing as described in Chapter 6 of this manual when solid-phase sediment or sediment extracts are not under a hood or in a ventilated work area.

10.5 CLEAN UP OF EQUIPMENT AFTER SEDIMENT PROCESSING

Glassware and equipment coming in contact with sediment will be cleaned as soon as possible. Cleaning glassware poses an increased exposure hazard. Therefore, all glassware must be cleaned under the vented sinks or hoods located in the laboratory work area.

10.6 SEDIMENT ASSESSMENT FIELD OPERATIONS SAFETY STANDARD OPERATING PROCEDURES.

The following rules must be followed by sediment assessment field personnel:

SMOKING IS NOT ALLOWED.

1. When away from the dock, a personal flotation device must be worn any time you are out of the cabin.
2. No one is to go up onto the cabin roof without the captain's permission.
3. No one is to climb up onto, stand up on, or move around on the cabin roof while the ship is underway.
4. While underway, no one is to move to the aft deck by way of the outboard edge and handrail.

5. While underway, try to keep movement to a minimum.
6. When lifting equipment with the boom and winch, hard hats with face shields must be worn by anyone on the forward deck.
7. When collecting sediments, only the designated collection crew are to be on the forward deck.
8. When collecting sediments, personal protective equipment must be worn, including splash suit, safety glasses, disposable gloves, outer green gloves taped to the suit, rubber boots or boot covers, and hard hats with face shields.
9. Full face shields are to be worn any time there is a strong possibility that sediment may be splashed upon you. In particular, face shields should be worn when removing sediment cores from the aluminum tube and when washing sediment off equipment or the deck.
10. No contaminated splash suits or boots are to be worn or carried into the cabin until decontaminated.
11. When sediment is present on the forward deck, no one is to step out onto the forward deck unless, at a minimum, a Tyvek® suit, disposable gloves, boots and safety glasses are worn. Once contaminated, this clothing is not to be worn back into the cabin until decontaminated.
12. Heat-related emergencies are one of our primary concerns during the summer. Many times heat-related risks are a greater threat to our safety than the possibility of chemical contamination. Good judgment is essential. Pace yourself by knowing your limits. Field work is not a race and above all not a competition. During extreme heat, the Captain/Safety Officer will be monitoring your condition and recommending you drink plenty of water. You may also be requested to remove your safety clothing and take a break in the air conditioned cabin. If you feel the effects of heat stress, inform the Captain/Safety Officer.