

June 1995
NSRP 0448

NATIONAL SHIPBUILDING RESEARCH PROGRAM

**Basic Elements of Occupational Safety & Health
Programs for Shipyard Employment**

U.S. DEPARTMENT OF THE NAVY
CARDEROCK DIVISION,
NAVAL SURFACE WARFARE CENTER

in cooperation with
National Steel and Shipbuilding Company
San Diego, California

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 1995		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE National Shipbuilding Research Program, Basic Elements of Occupational Safety & Health Programs for Shipyard Employment				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Surface Warfare Center CD Code 2230 - Design Integration Tools Bldg 192 Room 128 9500 MacArthur Blvd Bethesda, MD 20817-5700				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 19	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

DISCLAIMER

These reports were prepared as an account of government-sponsored work. Neither the United States, nor the United States Navy, nor any person acting on behalf of the United States Navy (A) makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness or usefulness of the information contained in this report/manual, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or (B) assumes any liabilities with respect to the use of or for damages resulting from the use of any information, apparatus, method, or process disclosed in the report. As used in the above, "Persons acting on behalf of the United States Navy" includes any employee, contractor, or subcontractor to the contractor of the United States Navy to the extent that such employee, contractor, or subcontractor to the contractor prepares, handles, or distributes, or provides access to any information pursuant to his employment or contract or subcontract to the contractor with the United State Navy. ANY POSSIBLE IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR PURPOSE ARE SPECIFICALLY DISCLAIMED.

NATIONAL SHIPBUILDING RESEARCH PROGRAM

SNAME SP-5

HUMAN RESOURCE INNOVATION

BASIC ELEMENTS OF
OCCUPATIONAL SAFETY AND HEALTH
PROGRAMS FOR
SHIPYARD EMPLOYMENT

JUNE 1995

Prepared by

WIN/WIN STRATEGIES

Consultant in Cooperation with
National Steel and Shipbuilding Company
San Diego, California

Project 5-94-1

Basic
Elements

of

Occupational
Safety and Health
Programs

for

Shipyard Employment

Acknowledgments

This publication is the deliverable of a research project managed by the consulting firm Win/Win Strategies of Bethlehem, Pennsylvania, for the National Shipbuilding Research Program (NSRP) pursuant to Subcontract Agreement No. MU25656 between National Steel and Shipbuilding Company (NASSCO) of San Diego, California and Win/Win Strategies.

The NSRP is a joint government and industry program dedicated to improving productivity in shipbuilding, overhaul, modernization and repair by seeking, developing and implementing new ideas, technologies and equipment in the United States shipyards, both private and public.

This research project was commissioned by Panel SP-5, Human Resource Innovation, of the Ship Production Committee of the Society of Naval Architects and Marine Engineers (SNAME) under the auspices of the NSRP. Membership in Panel SP-5 is composed primarily of commercial shipbuilding managers and leaders of labor unions which represent employees at several of those shipyards and also includes representatives of the US Navy, the Maritime Administration (MarAd) and the Occupational Safety and Health Administration (OSHA).

Panel SP-5's charter calls for it to develop, test and disseminate new management practices and organizational forms which better tap the potential of shipyard human resources for the purpose of increasing shipyard productivity.

This project has its roots in the publication in January 1991 of A Survey: The Principal Elements of Safety Programs of Nine Major American Shipyards (NSRP Publication # 0318). That publication has been widely circulated within the shipyard industry and elsewhere. It is a virtual snapshot of actual safety and health programs and their principal elements and chronicles the differences as well as the similarities in approaches to safety and health matters among six private and three public American shipyards. It has sparked considerable interest within the domestic shipbuilding and ship repair industry, not only from labor and management representatives but also from government sources. Prominent among those government sources is OSHA which has cited the project as a positive first step taken jointly by labor and management interests to address their own safety and health issues.

A next logical step after publication of the Survey appeared to Panel SP-5 to be for it to develop as complete and universal a safety and health program as practicable, which any and all yards could adopt and/or against which an existing program could be compared. This research project was undertaken as that next logical step. Its purpose is the development of a generic or model safety and health program for shipyard employment by identifying core elements of safety and health programs and

methods and procedures for their implementation. In its basic elements, the program so developed provides worker protection encourages innovation and flexibility and is in consonance with and complements OSHA's Standards in Shipyard Employment. It is offered to industry and to OSHA as a benchmark against which an individual yard's safety and health program may be measured. Adoption of elements applicable to a specific workplace provides flexibility for the creation of a customized safety and health program. A secondary albeit real consideration is the production of a program suitable for submission to OSHA in the hopes of preempting the promulgation of such a program designed by bureaucrats with less expertise than is available within the extended Panel SP-5 family.

From that extended family, the Panel sought and obtained volunteers to serve on an ad hoc committee which created the desired end product through meetings and exchanges and reviews of draft documents. The members of that committee were as follows;

James Childs, Vice President Local Lodge S33, IUMSWA/IAMAW,
Baltimore, MD,
Bob Guastini, Chief of Productivity Improvement GD - Electric Beak Quonset
Point Facility, North Kingstown, RI,
Rich Hibler, Safety Engineer, BethShip, Sparrows Point Yard Sparrows Point
MD,
Blaine Lewis, Manager, Workers' Compensation St. John Shipbuilding New
Brunswick Canada,
Ken Malvitz Manager, Safety and Health Peterson Builders, Inc., Sturgeon
Bay WI,
Chet Matthews, Director, Safety. Health and Environmental Protection Bath
Iron Works, Bath ME,
W.D. "Chico" McGill Assistant Business Manager, Safety Committee
Chairman IBEW Local Union 733, Pascagoula MS,
Jim Paulson, Manager, Safety, Industrial Health and Fire, NASSCO, San
Diego, CA
Milan Racic, Health and Safety Specialism Boilermakers International Union
Milwaukee, WI,
Steve Sullivan, Human Resources Manager, BethShip, Sparrows Point Yard,
Sparrows Point, MD and, at the beginning of this project Chairman of
Panel SP-5,
Marty Summers, Assistant Safety Manager, Avondale Industries, Inc, New
Orleans, LA
Jim Thomson, Manager, Safety, Health and Environment Newport News
Shipbuilding Newport News, VA and
Charley West, Safety Director, Norfolk Naval Shipyard Portsmouth VA.

Ex Officio members of the ad hoc committee were:

Leonard Beauchamp, Director of Research and Collective Bargaining Services,
Boilermakers International Union, Kansas City, KS and
Chuck Rupy, Strategic Weapons Systems Program Manager, GD - Electric
Boat Groton CT. (During the course of this project, Mr. Rupy succeeded
Mr. Sullivan as the Chairman of Panel SP-5.)

In addition, Joe Daddura Occupational Safety and Health Specialist, DOL -
OSHA Washington, DC served as an advisor to the ad hoc committee.

The depth and breath of individual knowledge and experience in safety and health matters in general and in safety and health programs specifically which these volunteer members brought to this project and their collective dedication to achieving the highest quality result were of an excellence rarely experienced in industrial life. The preceding speaks eloquently of the industry's commitment to the safety and health of its employees.

Frank Long, Principal Consultant of Win/Win Strategies and the author of NSRP Publication # 0318, served as coordinator of the committee's efforts and is the author of this report. The privilege of working with this remarkable collection of talent is acknowledged by the author with gratitude. His admiration of their individual and collective talents, their ability to create positive results out of their inevitable differences of opinion and their dedication of purpose defies description.

**BASIC ELEMENTS OF OCCUPATIONAL
SAFETY AND HEALTH PROGRAMS FOR SHIPYARD EMPLOYMENT**

Table of Contents

	<u>Page</u>
Preamble	1
I. Purpose and Scope	2
II. Administration	3
III. Methods and Procedures	5
IV. Training	6
V. Employee Participation	8
VI. Internal Audit of Program Performance	8

Preamble

At the core of an organization's¹ business is the creed that it has an obligation to ensure (and its employees have a right to expect) that if its employees report to work with all of their body parts working, they will go home the same way at the end of their workday. That fact should be clearly and unambiguously understood by all members of the organization.

Given that the causes of accidents fall into two basic categories - unsafe conditions and unsafe acts - it is generally held that management is responsible for providing a safe and healthful workplace and safe and healthful working conditions and that employees are responsible for acting in a safe and healthful manner. Beyond those considerations, it is generally acknowledged that management has the responsibility to ensure that employees are aware that certain acts are unsafe and are aware of ways to avoid them. It fulfills that responsibility by providing formal and informal training, both on the job and in the classroom, it ensures that both first and second line supervisors are similarly aware and it holds those supervisors accountable for their own occupational safety and health performance and the safety and health performance of the employees under their supervision.

¹The term "organization" is used throughout this document in the generic sense and is intended to include each company or corporate or government entity which operates as a separate entity in the shipyard industry.

I. Purpose and Scope

From the standpoint of safety and health concerns, among many standpoints, shipyard employment is an endeavor quite unlike any other. It involves the performance of heavy, rigorous work...

in all kinds of weather
on land at sea or in the air
at significant heights or depths
by people of varied skill levels
plying every major trade
interdependently,
often in enclosed or confined spaces
which magnify exposure to noise or to toxic atmospheres
or which threaten to explode,
where the hazards to be reckoned with are legion
ranging from acetylene to zinc
and the conditions to be prevented include radiation exposure,
respiratory distress and rabies,
in a constantly changing environment
with contractors, inspectors and fellow employees undefloot
where supplied services include electricity, steam water, compressed
air, ventilation, heat, industrial gases and hydraulics (sometimes all at
once)
where continual and often extremely sophisticated crane lifts can be
vital to the production process and
where, particularly at high volume, significant turnover levels breed
dangerous unfamiliarity.

Employers in the industry are constantly seeking improved means of controlling, reducing and eliminating hazards and they recognize the necessity of a systematic program of policies, procedures and practices which are designed to ensure that employees work under safe and healthful conditions in a safe and healthful workplace.

This document is a product of the shipbuilding industry's commitment to the safety and health of its employees and is intended as a guideline for the creation and implementation of such a program for shipyard employment in an organization where one may not now exist or as a benchmark against which existing safety and health programs can be measured and from which such a program may perhaps be improved.

II. Administration

A. Safety and Health Policy

A formal written statement signed by the organization's chief executive, setting forth the organization's guiding principles in safety and health matters, its objectives and its policy toward achieving those objectives, provides insight into the character of the organization and its level of sincere commitment.

The statement of the organization's policy may be in the form of either (a) a policy statement in a formalized safety and health program or (b) a stand-alone document in the form of a letter from senior management to all employees such as a Memorandum of Safety and Health Policy signed by the chief executive. The statement should at minimum recognize the organization's obligations under all laws, regulations and internal standards.

Inherent in the concept of the essentiality of a statement of organization policy is the fact that ultimate responsibility for the occupational safety and health of the organization's employees resides exclusively in its management. Management provides the funding for the program's design and implementation including funds for mandated and elective safety and health training and is accountable for workplace accidents and their consequences.

The degree of dedication with which the organization implements and enforces its safety and health policy is critical to the policy's effectiveness. Among the factors which both demonstrate and promote such dedication is top management's active involvement in policy implementation as reflected in the safety and health program

B. Authority/Responsibilities

Management will designate an official with sufficient authority and responsibility to represent effectively the interests and support of the organization in the management and administration of the occupational safety and health program and will provide that official with adequate resources to ensure the implementation of the occupational safety and health program at all organizational levels.

1. Supervisory Responsibilities

Each employee who exercises supervisory functions shall, to the extent of his/her authority, furnish employees employment and a place of employment which are free from recognized hazards that are causing, or are likely to cause death or serious physical harm.

2. Employee Responsibilities

Each employee will comply with the standards, rules, regulations and orders issued by the organization which are applicable to his/her own actions and conduct.

3. Subcontractor Considerations

Prior to the commencement of any work to be performed by a subcontractor, the Management and the subcontractor will discuss their respective responsibilities as to safety and health matters and the Management will ensure that the subcontractor recognizes the hazards to which a subcontractor employee may be expected to be exposed.

C. Policy and Procedures

1. Management will establish:

- a) an occupational safety and health policy and program to ensure compliance with all applicable laws and regulations and to provide a safe and healthful place of employment.,
- b) procedures that ensure effective implementation of the organization's policy and program considering its mission organization and size,
- c) goals and objectives for reducing and eliminating occupational accidents, injuries and illnesses,
- d) plans and procedures for evaluating the organization's occupational safety and health program effectiveness at all organizational levels and
- e) priorities with respect to the factors which cause occupational accidents, injuries and illnesses in the organization's workplace so that appropriate corrective action can be taken.

2. Evaluation of Occupational Safety and Health Performance

The organization will ensure that any performance evaluation of any management or supervisory employee includes measures of that employee's fulfillment of his/her responsibilities under the organization's occupational safety and health program.

3. Recognition of Superior Performance

Recognition of superior performance in discharging safety and health responsibilities or otherwise promoting workplace safety and health by an individual or group should be encouraged.

4. Communications

Details of the organization's occupational safety and health program and applicable safety and health standards will be communicated to employees and any employee representatives. Such details include:

- (a) procedures for responding to reports by employees of unsafe or unhealthful working conditions,
- (b) where employees may obtain information about the organization's occupational safety and health program and
- (c) relevant information about any safety and health committee that the organization may have and other important information about safety and health matters within the organization.

III. Methods and Procedures

A Identification, Evaluation, Elimination and Control of Hazards

The organization's occupational safety and health program will incorporate the activities outlined below in this Section III Methods and Procedures. The intent of these activities is to prevent hazards by identifying them, analyzing their causes and implementing corrective action which will thereafter be implemented measured evaluated for effectiveness and incorporated into future hazard prevention activities. A process of continuous program evaluation and improvement should be established for all elements of the safety and health program.

Establish procedures to identify hazards:

- (1) ergonomic, environmental physical, and substance abuse
- (2) employee reports of unsafe or unhealthy working conditions

The program should provide a system which espouses frequent "top-down" communication to employees of useful information regarding safety and health matters and which encourages "bottom-up" communication from employees regarding the existence of hazards in the workplace. Critical to the effective functioning of such a system is the clear understanding that the managerial/supervisory response to any such employee communication will be positive and prompt and will not in any respect be negative and that no employee should perceive any reason to be deterred from so communicating.

- (3) job safety analyses
- (4) record keeping and reporting and data analysis
 - safety performance records, e.g. frequency, severity, etc.
 - accident reports
 - medical records

safety and health training records
maintenance records

(5) accident investigation reports

While all accidents should be investigated, including accidents involving property damage only, the extent of such investigation should reflect the seriousness of the accident. Its elements may include appropriate documentation of time, date, location, description of operation, description of accident photographs, interviews of employees and witnesses, measurements and other pertinent data.

(6) material safety data sheets

(7) safety inspections

a) Inspections will be conducted by personnel qualified to recognize and evaluate hazards in the working environment and to suggest general corrective action.

b) All inspection personnel will be provided the equipment and other resources necessary to conduct a thorough inspection of the workplace involved.

c) All areas and operations of the workplace, including office operations, should be inspected at least annually. More frequent inspections should be conducted in all workplaces where experience indicates an increased risk of accident injury or illness.

B: Corrective Action

(1) Engineering controls

(2) Administrative controls

(3) Personal protective equipment

(4) Preventive maintenance - facilities and equipment

C: Follow-up

Monitor effectiveness of corrective action.

IV. Training

A. Introduction

Effective and comprehensive training is an integral part of an organization's safety and health program which should include, at minimum, all training mandated by local, state and federal regulations in safety and health matters. Training is provided to all employees, including management employees, in both their responsibilities in and the rights afforded by the organization's safety and health program. Such training provides the technical knowledge of safety and health matters necessary to avoid personal illness or injury and damage to

equipment product or property. Training is accomplished by means of classroom study, on-the-job experience, positive reinforcement and appropriate combinations thereof which can reasonably be expected to produce the improved safety and health results the training is designed to accomplish.

B. Management Employees

Management employees should be trained to manage effectively the organization's safety and health program. The scope and emphasis of such training of any individual management employee will be governed by the needs of the organization giving due consideration to its structure and his/her role in it but should, at minimum, include the organization's safety and health policy, management responsibilities under the program and performance measurements.

C. Supervisory Employees

Training of supervisory employees should include familiarity with the organization's safety and health policy and the manner in which its safety and health program is designed to implement that policy. Training of a supervisory employee should also include knowledge of his/her (and upper management's) responsibility to provide safe and healthful working conditions for employees; occupational safety and health standards and relevant new developments applicable to his/her assigned work place; procedures for reporting, protecting against and eliminating hazards, as well as other appropriate rules and regulations.

D. Safety and Health Personnel (management employees)

This training should build upon an individual's professional background to enhance professional and technical occupational safety and health skills. Such training may combine academic course work with seminar and/or laboratory work, field study and other formal and informal learning experiences.

Personnel assigned to perform safety and health inspections should receive training in the application and interpretation of appropriate standards and the equipment and testing procedures used in identifying and evaluating hazards. Such training should also address general abatement procedures during or following assigned inspections as well as preparation of reports and other documentation used to support the inspection findings.

E. Hourly Employees

All employees should be informed of the organization's safety and health policy and its safety and health programs and should regularly be reminded of specific aspects thereof. Specialized safety and health training should also be provided for employees whose specific job assignments involve hazards beyond those generally regarded as normal.

Employees assigned to perform safety and health inspections as part of their normal and customary job functions must, of course, receive additional, specialized training.

V. Employee Participation

There is general acceptance of the observation that each shipyard in the industry has its own culture. That culture is the product of many factors including the yard's history, its size, its organizational structure, its employee relations atmosphere and its management style. It is dynamic, not static, and adjusts to internal and external influences. Each yard, therefore, develops and implements its policies and procedures, including those governing occupational safety and health matters, in a manner that suits its culture. What works in one yard may not work in another; each yard is the best judge of what will work for it.

Within the framework of accountability and responsibility described above in Section II. Administration, the most effective safety and health programs are those which maximize and recognize participation by employees and their representatives; indeed, there are experts who, from experience, are convinced that a safety and health program cannot be effective without such participation.

Where a decision is made to include employee participation in the safety and health effort emphasis should be placed on encouraging the involvement of employees both in the structure and operation of the program and in decisions affecting their safety and health. Such involvement promotes a sense of ownership, which is vital to the effectiveness of the participatory effort. In any event, positive performance recognition is integral to the success of any such effort: it encourages continued and greater involvement and, in participatory and non-participatory efforts alike, fosters further improvement.

VI. Internal Audit of Program Performance

Management will develop and implement a systematic process for internally auditing the effectiveness of its safety and health program so that it can determine whether policies and procedures are implemented as planned and whether, in practice, they have met the objectives set for the program. Internal audits will be conducted on a regular schedule to gauge performance levels over time. A summary report of the results of the internal audit will be prepared and will contain recommendations for improving the organization's performance.

THE NSRP NEEDS YOUR EVALUATION OF THIS REPORT!

PLEASE RETURN A RESPONSE CARD AFTER READING REPORT.

NSRP READER RESPONSE CARD

We would appreciate your comments on this report. Please take a few minutes to complete and return this postage-paid card. Thank you.

Name _____

Organization _____

Phone _____

•Overall Quality of Report

☐ Excellent ☐ Good ☐ Fair ☐ Poor

•Usefulness to You/Your Organization

☐ Very Useful ☐ Moderately Useful ☐ N/A

•Did/Will your organization implement the results of this project? ☐ Yes ☐ No

If not, why? _____

•How Did You Receive Report?

☐ Mailed directly to you

☐ Referred to you by someone else

•Did/Will You Pass Report On To Someone Else?

☐ Yes ☐ No

•In Your Opinion, Is Anything Missing That Would Make This Report Better?

☐ Yes _____

•General Comments

NSRP 0448

NSRP READER RESPONSE CARD

We would appreciate your comments on this report. Please take a few minutes to complete and return this postage-paid card. Thank you.

Name _____

Organization _____

Phone _____

•Overall Quality of Report

☐ Excellent ☐ Good ☐ Fair ☐ Poor

•Usefulness to You/Your Organization

☐ Very Useful ☐ Moderately Useful ☐ N/A

•Did/Will your organization implement the results of this project? ☐ Yes ☐ No

If not, why? _____

•How Did You Receive Report?

☐ Mailed directly to you

☐ Referred to you by someone else

•Did/Will You Pass Report On To Someone Else?

☐ Yes ☐ No

* In Your Opinion, Is Anything Missing That Would Make This Report Better?

☐ Yes _____

•General Comments

NSRP 0448



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 2635 SAN DIEGO CA

POSTAGE WILL BE PAID BY ADDRESSEE

NASSCO/NSRP PROGRAM MANAGER

ATTN: Pamela Roach M.S. 22-A
National Steel and Shipbuilding Co.
P.O. Box 85278
San Diego, CA 92186-5278



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 2635 SAN DIEGO CA

POSTAGE WILL BE PAID BY ADDRESSEE

NASSCO/NSRP PROGRAM MANAGER

ATTN: Pamela Roach M.S. 22-A
National Steel and Shipbuilding Co.
P.O. Box 85278
San Diego, CA 92186-5278



Additional copies of this report can be obtained from the National Shipbuilding Research Program Coordinator of the Bibliography of Publications and Microfiche Index. You can call or write to the address or phone number listed below.

NSRP Coordinator
The University of Michigan
Transportation Research Institute
Marine Systems Division
2901 Baxter Rd.
Ann Arbor, MI 48109-2150
Phone: (313) 763-2465
Fax: (313) 936-1081