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THE NATIONAL SHIPBUILDING RESEARCH PROGRAM

Environmental Training Modules
Module 1
Good Environmental Practices

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

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Environmental Training Modules

Module 1

Good Environmental Practices

Prepared by:

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NSRP 0541
(N1-94-02)

Module 1 and Module 2
Good Environmental Practice Sessions

Introduction:

Module 1 (NSRP 0541) and Module 2 (NSRP 0542) are designed to provide environmental awareness training to shipyard employees on various specific and general subjects ranging from air quality to hazardous waste management. The modules are divided into "sessions" called "Good Environmental Practices" (GEPs). The training package contains slides, instructor notes, and student handouts for each GEP training session. The training sessions are indexed into the following 8 directory files: General, Air, Water, Hazardous Materials and Waste (Haz-Cord), Oil and Bulk Fuel Transfer (Oil-Tran), Department of Transportation Regulations for Hazardous Materials Transportation (DOT), Paint, and Preventive Maintenance (PM).

Module 1 focuses on introductory environmental practices that are universal in nature and appeal to a diverse classroom of shipyard crafts. Module 1 is contained in the directory labeled "General". The GEPs are intended to provide the basis or foundation of understanding about key environmental issues in the shipyard. On the other hand, Module 2 Sessions are intended to reiterate, reinforce and extend upon subjects encountered in Module 1. Module 2 has a more comprehensive scope, in that a larger number of subjects are discussed that potentially pertain to a wide variety of shipyard crafts.

Scope of Module 1

Module 1 contains 18 GEP training sessions that span nearly all shipyard environmental areas of concern. The sessions touch on key issues in a general nature to provide an introduction to Good Environmental Practices to workers that have no environmental awareness training and/or new employees in shipyard. Included in this module is an introduction to federal environmental laws and regulations that affect shipyard operations the most.

Module 1 contains approximately 40 slides on 17 main GEP subjects plus the environmental law introduction. The files are located in the "General" directory. For the presentation, each slide should take between 4 and 6 minutes to present. Therefore, the entire sessions should take between 3 and 4 hours if all of the slides are presented to the class.

Modifying Module 1

Module 1 (NSRP 0541) is essentially a package of GEP sessions that have been selected as "introductory" for the purpose of entry level environmental training. Some shipyards may decide that all of the GEP sessions in Module 1 contain too much information to be given to entry level employees during orientation. If this is the case, the shipyard can simply go through the GEP sessions and identify the subjects that they would like to present (e.g., 8 Modified GEP sessions, 1 hr. orientation).

Scope of Module 2

Module 2 (NSRP 0542) "Craft Specific GEPs" includes over 85 training sessions on various environmental subject matters. Each GEP training session has an employee handout, overheads, and instructor's notes. The GEP sessions provide specific training on air quality

issues, water quality issues, hazardous waste concerns, waste minimization, transportation of hazardous materials (DOT), bulk hazardous materials transfer (USCG), and a number of other topics. The craft specific practices are arranged in a manner to facilitate customized Good Environmental Practices training programs for a variety of shipyard workers. The GEPs are written in a manner to illustrate the problems that may be encountered and to identify practices that, when applied correctly, can minimize the potential for hazardous spills, chemical related accidents, and environmental harm.

Applying Module 1 and 2 GEP Sessions: Creating Training Programs

Shipyards throughout the nation have different approaches and philosophies towards performing environmental awareness training. Training in specific shipyards must integrate with existing programs and fit into the current training organization. Module 1 and 2 are designed and organized in such a manner to enable shipyards to customize GEP sessions for various crafts and training groups. Therefore, Module 1 and 2 GEP sessions provide a flexible approach for shipyards to address environmental training.

The purpose of the training session flexibility is to enable the individual shipyards to create customized training programs for shipyard crafts (groups). No shipyard has the same set of shipyard crafts, departments, and worker organizations. Different craft groups have varying sets of responsibilities and work functions. The responsibilities and functions of each of the craft work groups, and how they interact with environmental concerns, is the main driver behind what type of GEP training is needed.

The Modules 1 and 2 contain over 100 GEP sessions that can be assembled together and presented in a variety of ways.

Each shipyard will need to identify their training groups by functions and responsibilities. These groupings will vary depending on the shipyard's approach to environmental compliance management and GEP training. One approach is to identify persons in the shipyard responsible for hazardous waste in their area and create a training program specifically for these individuals. This approach could result in a training program called "Hazardous Waste Coordinators" or "Hazardous Materials Coordinators." The shipyard could also use a similar approach that creates a training program for all persons in a particular craft. For example, all individuals from a particular craft would receive training (i.e. "Paint Craft Environmental Training" or "Maintenance Craft Environmental Training"). As another option, the shipyard may use a combination of the previous two approaches for addressing the environmental awareness training needs in their organization because of the various responsibility levels and regulatory requirements. The method chosen will be driven by the shipyard management structure and the shipyard's overall philosophy towards environmental training.

Other Training Approaches Utilizing Module 1 and 2 GEPs

The GEPs can be applied to the shipyard and provided to employees through a variety of mechanisms. The GEPs are structured in such a manner to allow for a short presentation approach. For example, shipyards could presented information from the GEPs at "Gang Box" Meetings on a daily basis. The GEP information could also be posted as "Environmental Grams" to be read by employees. Similarly, articles in the shipyard newsletter could be

tailored after selected GEP sessions. The key is to continually inform the employees about environmental awareness issues and the shipyard's commitment to environmental compliance.

Example Good Environmental Practice Matrix Program

An example GEP training matrix has been assembled to illustrate the development of Craft Specific Training Programs. On the horizontal axis, the matrix identifies several Departments, Crafts, and Work Groups in the shipyard that need environmental awareness training. Similarly, on the vertical axis, the nearly 100 GEPs are listed. Example "X's" have been assigned to GEP sessions that apply to the work groups. All of the GEP Sessions marked for a particular group would consist of a training program for that group. Each shipyard will want to develop a similar matrix to develop Craft Specific Training Programs.

GEP Sessions are Designed for Shipyard Modification

The training manual GEPs identify many practices and procedures that are considered "Good". The text in many cases also identifies what employees "should or could do." The shipyard may want to go in to the document and state "will do" to institute a shipyard good environmental policy. Many shipyards may not want to institute these practices in their shipyard for a variety of reasons. All training materials are available to download in their original Word and Powerpoint formats. Shipyards will usually want to modify the GEP Sessions to fit their specific environmental policies and add state requirements as needed.

Modification	Purpose for Modification
Change Text	Add policy and procedure statements and references; remove statements that do not apply; increase scope of GEPs
Add Shipyard Specific Photos	Add photos from specific shipyard areas to be used in the overheads.
Add Graphics	Add the company logo and other graphics to the training overheads and student handouts.
Customize Instructor Notes	Cusomize the instructor's notes to help with shipyard specific anecdotes and situations.
Change Slide Format and Color	Modify slide colors and formats to different tastes. Current colors and formats are conservative in nature.
Prepare Other GEPs	Using the same formats, create GEP Sessions to address specific shipyard issues.
Cut and Paste	Remove text to be incorporated into other documents and integrate text as needed from other related documents.
Link Files	Link individual GEP files together to arrange Training Programs for selected craft groups.
Integrate With Other Documents or Manuals	Many of the GEPs can be integrated with BMP, SWPP, and other permits and plans. Similarly, information from shipyard specific plans can be integrated into the GEP Sessions.

Software and Hardware Requirements

Software Requirements

The basic software requirements will enable the user to fully modify the training program to fit into their organization. The software can be operated by individuals who have a basic understanding of personal computers (PCs) “IBM compatibles” and experience working in a Windows environment.

Software Needed (Minimum Versions)

Microsoft Windows 95
Microsoft Word 7.0
Microsoft Power Point 6.0
Corel Photo-Paint Version 5.0

Hardware Requirements

The software required to modify and fully utilize this document has basic hardware requirements that must be fulfilled to run the programs. The minimum hardware arrangement will be very slow for modifying the presentations and the photographs. The photographs take a significant amount of memory and processing time. It is very desirable to have a Pentium processor and enough memory to store the training program on the hard drive. The table below displays minimum requirements and a highly recommended computer hardware systems for maximum use of the training document.

Minimum Requirements	Highly Recommended
Processor: 386	Processor: 486 or a Pentium
RAM: 8 Megabytes	RAM: 16 Megabytes or more
Hard Drive: 240 Megabytes	Hard Drive: 1 Gigabyte or more
Display: VGA	Display: SVGA
Mouse	Mouse: Logitec
Windows 95	Windows 95
iomega Zip Drive 100	CD ROM
Microsoft Office 7.0	Math Co-Processor
	Video Card - w/1M DRAM or more
	Color Scanner

Integrating Pictures into the Presentations

In many cases, shipyards will want to integrate pictures from their own operations into the presentation. This is easily accomplished using Corel Photopaint.

First Step - Getting photos and graphics in a format that the computer can read:

There are a couple of ways this can be accomplished. One method is to take 35mm pictures and have them transferred to CD-ROM. Kodak *Photo CD* is an excellent method. Consult your local photo developing labs about this process. It takes approximately 7 days and the cost is around $3.00 a picture. Another method is to scan the pictures yourself on a personal scanner. This may be accomplished in the publishing department of the shipyard or at a local copy shop. The photos are usually saved as "tif" files (i.e. HAZMAT.tif). Other types of files will also work; consult Corel and Microsoft word manuals.

Second Step: - Integrate photos into the presentation:

1) In Microsoft Power Point, photos and graphics are inserted as "Objects".

2) To add a picture to a presentation, Insert and Object. Double Click on the Object box. The computer will ask from what application (Corel Photo-Paint). This will open Photo-Paint.

3) The first screen asks for the size and resolution of the photo. For a typical horizontal slide, set parameters to (Width = 378 Pixels, Height = 256 Pixels, Resolution 300, Color Mode = 256). Experiment with these settings to match your picture requirements.

4) Once in Photo-Paint, input "Edit" - "Paste From File". Now, if you have the photo on CD, identify the drive and the picture desired. Click "OK"

5) It is a good idea to perform some picture enhancements prior to fully importing the photo into Photo-Paint. When the first window comes up, click on "Image enhancement". The Kodak color corrections functions are the best. Try to enhance the photo by adding green, red, blue, brightness, and/or sharpness with the provided functions. Once the picture looks acceptable, click, OK.

6) Now the picture is on the screen inside the dimensions that you set in the parameters. The picture should be close to the size identified. Only the picture inside the dimensions specified will be transferred to Microsoft Power Point or Word.

7) Now click on "File" - "Close and Update;" this closes Corel Photo-Paint and returns you back to Power Point or Word. The picture will show up on the screen very small. Click on the picture and drag a corner. This will increase the picture size without distorting it.

8) Cropping the picture is frequently helpful. Click on the picture and then pull down the TOOLS menu and CROP PICTURE. The Crop function allows you to cut the picture and focus in a particular area. Once the picture is cropped, click on the Arrow and then click on the picture to enlarge and position it properly. Remember, always enlarge the photo by dragging from the corner.

Summary and Table of Contents of Good Environmental Practices Sessions for Module 1 (NSRP 0541) and Module 2 (NSRP 0542)

"GENERAL" GEPs DIRECTORY (Module 1, NSRP 0541)

INTRODUCTION TO GOOD ENVIRONMENTAL PRACTICES (1-Introduction to Shipyard GEPs.doc)
OBJECTIVE To introduce the basic environmental awareness and good environmental practices.

ENVIRONMENTAL LAW (2-Environmental Law.doc)
OBJECTIVE Provide a brief overview of Federal environmental statutes that impact the daily shipyard operations**.**

PROPER HAZARDOUS MATERIAL HANDLING (3-Material Handling.doc)
OBJECTIVE Increase personal safety and environmental preservation through the proper handling of hazardous materials.

CHEMICAL HAZARDS IN THE SHIPYARD (4-Chemical Hazards.doc)
OBJECTIVE Identify specific hazards of chemicals used within the shipyard.

HAZARDOUS MATERIAL CONTAINER LABELING (5-Labeling.doc)
OBJECTIVE To understand the importance of maintaining proper labeling of hazardous and non-hazardous materials, products and/or waste.

GOOD HOUSEKEEPING (6-Good Housekeeping.doc)
OBJECTIVE Maintain and clean and organized shipyard to minimize the likelihood for accidental pollution. This mean that the entire shipyard, as well as your immediate work area, should be kept clean and well organized.

POLLUTION PREVENTION AND POLLUTION PATHWAY ANALYSIS (7-Pollution Pathways.doc)
OBJECTIVE To enlighten shipyard employees about pollution pathway analysis and their local environmental surroundings. Shipyard personnel are to identify potential pollution pathways in their work-scope.

VOCs AND OTHER AIR QUALITY CONCERNS (8-Air Pollution.doc)
OBJECTIVE To minimize the release of vapors and dusts into the atmosphere, which may be harmful to employee health, public health, and the environment.

NO DUMPING! (9-No Dumping.doc)
OBJECTIVE Eliminate the discharge of pollutants into the surface waters, storm drains, sewers, sinks, toilets, grounds or air.

MINIMIZE THE POTENTIAL FOR PAINT SPILLS (10-Paint Spills.doc)
OBJECTIVE To follow simple practices that can help minimize paint spills that cost companies time and money.

IN YARD HAZARDOUS MATERIALS/WASTE TRANSPORTATION (11-Transporting Hazardous Materials.doc)
OBJECTIVE To minimize the likelihood of spills and other hazardous accidents during the transportation of hazardous materials and wastes throughout the shipyard.

EMPLOYEE LEVEL SPILL RESPONSE (12-Spill Clean-up.doc)
OBJECTIVE Ensure quick and safe response to hazardous materials spills in the shipyard.

SECONDARY CONTAINMENT (13-Secondary Contrainment.doc)
OBJECTIVE To identify the "secondary containment" requirements and systems to be used in the shipyard and promote their use in preventing hazardous materials spills and leaks. Also, to ensure that secondary containment systems are in place to catch accidental spills, leaks, and splashing of chemicals and wastes.

LIQUID STORAGE AREAS (14-Hazmat Storage.doc)
OBJECTIVE Provide an area where hazardous liquids can be stored that will help ensure potential spillage from containers such as paint cans, solvent drums, and oil drums does not soak into the underlying soils or enter nearby surface waters.

MANAGING COMMON SHIPYARD WASTES (15-Common Shipyard Wastes.doc)
OBJECTIVE Identify proper management of common shipyard wastes.

WASTE MINIMIZATION, REUSE, RECYCLING AND RECLAMATION (16-Recyling.doc)
OBJECTIVE Promote waste minimization, recycling, reuse and reclamation in the shipyard.

INSPECTIONS AND PERFORMANCE EVALUATION (17-Evaluation.doc)
OBJECTIVE To increase awareness and help to ensure that shipyard workers follow GEPs in their areas.

PURCHASING HAZARDOUS MATERIALS (18-Purchasing Hazardous Materials.doc)
OBJECTIVE To introduce prudent purchase practices to reduce costs and environmental liabilities.

AIR GEP DIRECTORY Module 2 (NSRP 0542)

ABRASIVE BLASTING IN THE SHIPYARD (1ABRASIV.DOC)
OBJECTIVE To use proper practices, procedures and facilities to minimize the release of fugitive abrasive blast material into the environment.

ABRASIVE BLAST CLEAN-UP, STORAGE AND TRANSPORTATION (2ABR-STR.DOC)
OBJECTIVE To ensure that abrasive blast material remains in control through proper clean-up, storage, transfer and transportation practices.

INDOOR ABRASIVE BLASTING BOOTHS, CABINETS AND TANK /COMPARTMENTS (3ABR-BTH.DOC)
OBJECTIVE To minimize particulate matter emissions from abrasive blasting operations in booths, tanks and compartments through implementation of preventive maintenance and other practices.

ABRASIVE BLAST CONTAINMENT (4ABR-CNT.DOC)
OBJECTIVE To reduce particulate matter emissions from abrasive blasting operations in shipyards through implementation of containment facilities, and structures.

COMPOSITE MATERIAL OPERATIONS (5COMPSIT.DOC)
OBJECTIVE To reduce particulate matter, volatile organic compound (VOC), and hazardous air pollutant (HAP) emissions derived from composite material operations through changes in work practices, processes, and through implementation of training and management policies.

DEGREASING OPERATIONS (6DEGRES.DOC)
OBJECTIVE To reduce emissions from various degreasing operations through work practice changes and equipment modification.

SOLVENT WIPING OPERATIONS (7SOL-WIP.DOC)
OBJECTIVE To reduce fugitive emissions from solvent wiping operations through process modification, material substitution, work practice changes, and equipment modification.

OZONE DEPLETING SUBSTANCES (ODS) EVALUATION AND CONTROL (8ODS.DOC)
OBJECTIVE To reduce usage and releases of Ozone Depleting Substances (ODSs).

WELDING OPERATIONS (9-WELD.DOC)
OBJECTIVE To implement and maintain procedures and practices that minimize the release of potentially toxic substances from shipyard welding operations.

ASBESTOS OPERATIONS IN THE SHIPYARD (10ASBTOS.DOC)
OBJECTIVE To ensure that shipyard personnel are aware of accidental disturbances and planned removal of asbestos containing material in shipyard facilities and on ships.

METAL FINISHING OPERATIONS (11MET-PT.DOC)
OBJECTIVE To reduce fugitive emissions from metal finishing operations such as plating and pickling processes through work practice changes and equipment modification.

WATER GEP DIRECTORY Module 2 (NSRP 0542)

CONTROLLING DISCHARGES TO DRY-DOCK FLOORS (1-DKFLR.DOC)
OBJECTIVE To control and contain potential releases from shipboard systems while the ship is under repair or new construction in dry-dock or in a building position.

ROUTINE AND PRE-DOCKING DRY-DOCK CLEANUP (2-CLEAN.DOC)
OBJECTIVE To ensure that materials on the dock floors and building positions are cleaned-up on a regular basis which helps to ensure a clean and safe working environment.

OVER WATER PROTECTION (3-OVER.DOC)
OBJECTIVE To provide minimize the potential for pollution when work is performed over water on berthed vessels and there is the potential for pollutants to enter the surface water.

STORM DRAIN PROTECTION (4-STORM.DOC)
OBJECTIVE To keep storm drains and their surrounding areas clean and cleared in such a manner to minimize the likelihood of storm water washing debris and other pollutants into adjacent waters.

LEAKING PIPES, HOSES, AND VESSEL CONNECTIONS (5-LEAKIN.DOC)
OBJECTIVE Prevent potential pollutants leaking from hoses, valves, couplings and vessel connections from entering surface waters and storm drains through inspections, secondary containment, and procedures for immediate repair.

PIER AND DECK SCUPPERS AND DRAINS (6-PIERS.DOC)
OBJECTIVE To prevent pollutants from entering the receiving waters through pier, berth and ship scuppers and drains.

PIPE TESTING AND FLUSH WATERS (7-FLUSH.DOC)
OBJECTIVE To ensure that flush and test waters used for piping systems and tanks are not discharged to surface waters, storm drains, or other pollution pathways.

WASHDOWN WATER CONTAINMENT AND CONTROL (8-WASHDN.DOC)
OBJECTIVE To ensure that contaminated wash water from fresh and salt water washdown of vessels does not enter adjacent surface waters.

STEAM CLEANING IN THE SHIPYARD (9-STEAM.DOC)
OBJECTIVE To properly contain, collect, and discharge all steam cleaning effluents.

OIL CONTAINMENT BOOM DEPLOYMENT (10-OILCN.DOC)
OBJECTIVE To ensure that accidental spills or other floatables lost to adjacent waters are contained and cleaned up efficiently.

CONTROLLING BILGE AND BALLAST WATERS (11-BLDG.DOC)
OBJECTIVE To prevent discharges of contaminated bilge and ballast water to adjacent surface water and also prevent unauthorized discharges to sewer connections.

INDUSTRIAL WASTE WATER DISCHARGE CONTROL (12-INDUS.DOC)
OBJECTIVE To ensure that all industrial waste water is disposed in accordance with local, state, and federal regulations and the policies and practices of the shipyard.

CONTROLLING SANITARY SHIPBOARD WASTEWATER (13-GREY.DOC)
OBJECTIVE To minimize the potential for sanitary waste water (gray and black) from ships to become uncontrolled and enter adjacent surface waters.

SHIPYARD SALTWATER FIRE SYSTEMS (14-FIRE.DOC)
OBJECTIVE Ensure the all discharges from saltwater fire systems are a non-contact processes and free of potential pollutants.

SHIPBOARD SALTBOX DISCHARGES (15-SALT.DOC)
OBJECTIVE To prevent the discharge of "contaminated" or high temperature saltbox water to adjacent surface waters or storm drains.

HAZARDOUS MATERIALS AND WASTE (HAZ-CORD) GEP DIRECTORY Module 2 (NSRP 0542)

HAZARDOUS MATERIALS IN THE SHIPYARD (1-HZ-MATS.DOC)
OBJECTIVE - To describe what hazardous materials are, their usage in the shipyard, and Material Safety Data Sheets (MSDS').

HAZARDOUS MATERIAL CONTAINER LABELS (2-LABEL.DOC)
OBJECTIVE - To explain and understand hazardous material labels to better determine how to protect yourself and the environment.

HAZARDOUS MATERIALS PRE-PURCHASE SCREENING (3-SCREEN.DOC)
OBJECTIVE - To describe in detail how hazardous materials are brought into the shipyard and identify methods for hazardous materials control.

PURCHASING HAZARDOUS MATERIALS (4-PURCH.DOC)
OBJECTIVE - To purchase hazardous materials prudently and ensure that they have been reviewed by Safety and Environmental before they are ordered.

RECOGNIZING HAZARDOUS WASTE (5-WASTE.DOC)
OBJECTIVE - To recognize and identify hazardous wastes for proper handling and disposal practices and procedures.

HAZARDOUS WASTE ACCUMULATION (6-ACCUM.DOC)
OBJECTIVE - To understand the waste accumulation process and associated practices and procedures for compliance, safety and environmental protection.

PROPER DISPOSAL AND CONTROL OF EMPTY CONTAINERS (7-EMPTY.DOC)
OBJECTIVE - To ensure that empty containers are disposed of in an appropriate and efficient manner.

HAZARDOUS MATERIALS AND WASTES STORAGE AREAS (8-HZ-STR.DOC)
OBJECTIVE - To provide storage areas for hazardous materials and hazardous wastes.

OIL STORAGE & CONTAINMENT (9-OIL-ST.DOC)
OBJECTIVE - To ensure proper storage of oil and oily waste water in the shipyard.

HANDLING HAZARDOUS WASTES (10-HANDL.DOC)
OBJECTIVE - To understand proper handling of hazardous wastes to prevent personal injuries, environmental spills, and other hazardous incidents.

MARKING & LABELING HAZARDOUS WASTES (11-MARK.DOC)
OBJECTIVE - To understand proper marking and labeling of hazardous waste containers for accumulation and transportation.

IN-YARD TRANSPORTATION OF HAZARDOUS WASTE (12-WTRANS.DOC)
OBJECTIVE - To understand the importance of proper in-yard transportation of hazardous waste and ensure efforts to minimize spills and associated hazardous incidents.

CRADLE TO GRAVE RESPONSIBILITY (13-CADL.DOC)
OBJECTIVE - To explain the importance of proper hazardous material disposal and the role of hazardous waste Transporters and Treatment, Storage, Disposal and Recycling Facilities (TSDRFs).

SPILL CLEAN-UP AND RESPONSE PLANNING (14-SPILL.DOC)
OBJECTIVE - To identify and follow procedures and practices for spill response and cleaning-up small spills.

ENVIRONMENTAL INCIDENT REPORTING AND INTERNAL RESPONSE SYSTEM (15-REPOR.DOC)
OBJECTIVE - To understand spill and environmental incident reporting procedures and practices in the shipyard and become familiar with the emergency response plan.

EXTERNAL ENVIRONMENTAL REPORTING AND REPORTABLE QUANTITIES (Rqs) (16-RQS.DOC)
OBJECTIVE - To identify responsibilities with respect to external reporting of environmental emergencies, spills and other hazardous materials incidents and to understand “Reportable Quantities” (RQs).

OIL AND BULK HAZARDOUS MATERIAL TRANSFER (OIL-TRANS) GEP DIRECTORY Module 2 (NSRP 0542)

INTRODUCTION TO TRANSFER OF OIL AND BULK HAZARDOUS MATERIALS (1-INTRO.DOC)
OBJECTIVE To introduce the students to the contents of the training and the learning objectives

LETTER OF INTENT (2-LETTR.DOC)
OBJECTIVE To understand the purpose and requirements of a shipyard facility "Letter of Intent."

FACILITY REQUIREMENTS, OPERATIONS MANUAL, AND LETTER OF ADEQUACY (3-OP-MAN.DOC)
OBJECTIVE To understand the facility requirements imposed by the shipyard operations manual and describe the letter of adequacy.

EQUIPMENT REQUIREMENTS (4-EQUIP.DOC)
OBJECTIVE To understand the equipment requirements associated with transferring oil or hazardous materials in bulk quantity to and from ships and other vessels.

PERSON IN CHARGE QUALIFICATIONS (5-PIC.DOC)
OBJECTIVE To define a shipyard bulk fluid transfer "Persons In Charge" (PIC) and associated qualifications.

SAFETY REQUIREMENTS (6-SAFTY.DOC)
OBJECTIVE To understand safety requirements associated with transferring oil and other bulk hazardous materials to and from ships and other vessels.

RECORDS AND RECORDKEEPING (7-RECORD.DOC)
OBJECTIVE To be aware of records that need to be kept at a shipyard engaged in oil and other bulk hazardous material transferring operations.

PROCEDURES FOR SPILLS, LEAKS AND OTHER INCIDENTS (8-SPILL.DOC)
OBJECTIVE To understand the process for reporting and responding to spills and other incidents during bulk oil and hazardous material transfer operators.

RESPONSE PLAN (9-RPLAN.DOC)
OBJECTIVE To understand the facility oil spill response plan and its requirements.

DECLARATION OF INSPECTION (10-INSPT.DOC)
OBJECTIVE To understand the importance of the declaration of inspection and its requirements.

TRANSFER REQUIREMENTS (11-TRANFR.DOC)
OBJECTIVE To understand the procedural and preparation requirements for transferring oil or hazardous materials from or to a vessel.

POST-TRANSFER REQUIREMENTS (12-PSTRS.DOC)
OBJECTIVE To understand the procedural and post-transfer requirements for transferring oil or hazardous materials from or to a vessel.

POST TEST (13-TEST.DOC)

DEPARTMENT OF TRANSPORTATION REGULATIONS FOR HAZARDOUS MATERIALS TRANSPORTATION (DOT) GEP DIRECTORY Module 2 (NSRP 0542)

INTRODUCTION TO DOT TRAINING (1INTRO.DOC)
OBJECTIVE To introduce the principal subjects covered in this training and the primary learning objectives.

HAZARD CLASSES & DIVISIONS (2HAZ-CLS.DOC)
OBJECTIVE To become familiar with the different hazard classes and divisions of hazardous materials, as specified in 49 CFR for hazardous materials transportation.

HAZARDOUS MATERIALS TRANSPORTATION TABLES (3TABLES.DOC)
OBJECTIVE To become familiar with and be able to utilize the Table of Hazardous Materials as presented in 49 CFR 172.101, and Appendix A, Hazardous Substances, and Appendix B, List of Marine Pollutants.

SHIPPING PAPERS FOR HAZARDOUS MATERIALS (4SHP-PAP.DOC)
OBJECTIVE To properly prepare shipping paper using the information as provided in the hazardous materials table, 49 CFR 172.101.

GENERAL MARKING REQUIREMENTS - (5MARLNG.DOC)
OBJECTIVE To become familiar with general marking requirements to prepare hazardous materials for transportation.

LABELING REQUIRED FOR HAZARDOUS MATERIALS TRANSPORTATION (6LABLE.DOC)
OBJECTIVE To become familiar with the labeling requirements and to choose a proper label(s) to prepare for hazardous material transport.

PERFORMANCE HAZARDOUS MATERIALS PACKAGING (7PACKAGE.DOC)
OBJECTIVE To understand DOT performance packaging standards for proper shipment of hazardous materials.

PLACARDING FOR HAZARDOUS MATERIALS TRANSPORTATION (8PLACKARD.DOC)
OBJECTIVE To learn the importance and general requirements of placarding for proper transportation of hazardous materials.

LOADING AND UNLOADING OF HAZARDOUS MATERIALS (9LOADING.DOC)
OBJECTIVE To understand proper loading and unloading procedures and practices for hazardous materials while moving to and from motor vehicles.

EMERGENCY RESPONSE FOR HAZARDOUS MATERIALS TRANSPORTATION (10EMERGY.DOC)
OBJECTIVE To understand the emergency response requirements mandated by the DOT in 49 CFR for transportation of hazardous materials.

INCIDENT REPORTING FOR HAZARDOUS MATERIALS TRANSPORTATION (11REPORT.DOC)
OBJECTIVE To become aware of proper reporting procedures to follow in an event of incident involving hazardous materials.

POST TEST (12TEST.DOC)

PAINT GEP DIRECTORY Module 2 (NSRP 0542)

PAINT MATERIALS CONTROL AND RECORDKEEPING LIFE-CYCLE (1-MATRI.DOC)
OBJECTIVE To enhance shipyard environmental management and improve compliance through accurate paint materials control and proper record keeping.

PAINT AREA ORGANIZATION AND HOUSEKEEPING (2-ORGANZ.DOC)
OBJECTIVE Maintain a clean and organized paint area to minimize the likelihood for accidental spills and potential pollution problems.

PAINT EQUIPMENT MAINTENANCE AND CLEAN-UP (3-CLEAN.DOC)
OBJECTIVE To clean and maintain paint equipment in such a manner that ensures proper operation and environmental protection.

SECONDARY CONTAINMENT AREAS AND MAINTENANCE (4-CONTAI.DOC)
OBJECTIVE Utilize secondary containment whenever possible and maintain the containment area.

PAINT STORAGE AND MIXING AREA MANAGEMENT (5-STORX.DOC)
OBJECTIVE To provide proper storage facilities and mixing areas for paint material usage and waste accumulation.

WASTE STORAGE AND ACCUMULATION REQUIREMENTS (6-WSTORE.DOC)
OBJECTIVE To store and accumulate wastes in an organized manner in compliance with all federal, state, and local requirements.

PAINT WASTE MINIMIZATION AND RECYCLING (7-WSTMIN.DOC)
OBJECTIVE To promote waste minimization, recycling, reuse and proper reclamation techniques in the paint department.

MINIMIZE OVERSPRAY AND INCREASE TRANSFER EFFICIENCY (8-OVERSP.DOC)
OBJECTIVE To minimize the amount of paint overspray and increase overall transfer efficiencies while painting throughout the shipyard.

OUTDOOR PAINT OVERSPRAY CONTAINMENT (9-TARPS.DOC)
OBJECTIVE To reduce particulate matter emissions from painting operations in shipyards through implementation containment shrouding and wind screens.

BOOTHS, CABINETS AND INDOOR TANK/COMPARTMENT PAINTING (10-BOOTH.DOC)
OBJECTIVE To minimize particulate matter and VOC emissions from painting operations in booths, tanks and enclosed compartments through implementation of preventive maintenance and improved environmental practices.

SOLVENT WIPING SURFACE PREPARATION (11-WIPE.DOC)
OBJECTIVE To reduce volatile emissions from solvent wiping operations through process modification, material substitution, work practice changes, and equipment modification.

PAINT CRAFT AREA INSPECTION (12-INSPE.DOC)
OBJECTIVE Inspect and evaluate paint area compliance with all good environmental practices.

PREVENTIVE MAINTENANCE (PM) GEP DIRECTORY Module 2 (NSRP 0542)

ENVIRONMENTAL PREVENTIVE MAINTENANCE (1-PM-INTRO.DOC)
OBJECTIVE To implement preventive maintenance measures that reduce the potential for accidental leaks and excessive operational emissions.

BOILER OPERATIONS (2-BOILER.DOC)
OBJECTIVE To minimize emissions generated by operating boilers through proper maintenance, fuel substitution, and improved management practices.

INTERNAL COMBUSTION ENGINES (3-COMBUST.DOC)
OBJECTIVE To reduce emissions from internal combustion engines (ICE) through implementation of preventive maintenance and process modifications.

DRYING OVENS AND FURNACES (4-OVEN.DOC)
OBJECTIVE To reduce the potential for emissions from drying ovens and furnaces through improved operational practices and procedures.

SOLVENT DISTILLATION UNITS (5-STILL.DOC)
OBJECTIVES To implement practices that minimize the potential for spills and excessive VOC emissions from solvent distillation operations.

COOLING TOWERS (6-COOLIN.DOC)
OBJECTIVE To minimize the potential for toxic emissions from cooling towers.

VARNISH DIP TANKS (7-DPTNK.DOC)
OBJECTIVE To reduce fugitive emissions and the potential for environmental incidents from varnish dipping processes through work practice modification, equipment modification, and employee awareness.

FUEL STORAGE AND TRANSFER OPERATIONS (8-FUEL.DOC)
OBJECTIVE To minimize the potential for VOC emissions and spills caused during fueling operations and fuel storage.

WASTEWATER TREATMENT UNITS (9-WSTWAT.DOC)
OBJECTIVE To minimize the potential for spills and air emissions from wastewater collection, treatment, and storage operations.

OBJECTIVE: Explain the importance of Good Environmental Practices to all shipyard workers.

INTRODUCTION TO SHIPYARD GOOD ENVIRONMENTAL PRACTICES

NOTES

INTRODUCTION TO GOOD ENVIRONMENTAL PRACTICES:

All shipyards are located at the meeting of land, air and water. This fact is driven by the nature of the work performed at, and by, shipyards. Shipyards also tend to perform work out-of-doors more often than other industries. Many of the job tasks performed by shipyard employees may result in the release of pollution to the environment.

For example, the application of marine coatings will result in the release of Volatile Organic Compounds (VOC) to the air. VOC, combined with other pollutants and sunlight, make "smog" or ozone. Abrasive blasting often results in the discharge of metal pollutants, such as copper, lead and zinc to the land and water. Engines on cranes and other shipyard equipment discharge air pollutants through their exhaust systems, and soil and water pollutants through leaks and spills of crankcase oils and lubricants.

As a result of the fact that shipyards have a high potential for pollution, and can discharge pollutants easily to the land, water, and air, shipyard operators and workers have a significant responsibility to protect the environment. Consequently, shipyards here, and throughout the United States, are highly regulated by federal and state environmental authorities. It is not unusual for shipyards to be regulated by more than twenty different agencies with respect to compliance with environmental laws and regulations.

Compliance, as well as non-compliance with the environmental regulations, also imposes a significant financial burden on the company. Many manhours and dollars must be spent to ensure that the shipyard does its best to stay within the law and prevent environmental accidents. If something does go wrong, even small incidents can cost tens of thousands of dollars in remedial actions and fines. It is even possible for a shipyard to be forced to close, with the resultant loss of employment for all of its employees for the violation of an environmental crime.
The purpose of integrating "Good Environmental Practices" into the shipyard is to ensure that all shipyard personnel understand

both the importance of protecting the environment, as well as the necessity for complying with environmental laws. This program will provide an introductory level of environmental awareness to all employees, upon which more detailed and task specific training can be applied.

INTRODUCTION TO SHIPYARD GOOD ENVIRONMENTAL PRACTICES

NOTES

OBJECTIVE:
Provide a brief overview of Federal environmental statutes that impact the daily shipyard operations.

ENVIRONMENTAL LAW
Over the past 50 years, but mostly in the last 20 years, the federal government has passed many environmental laws. Most have been directed at the protection of one of the three specific ✌media✍ air; land; or water. Due to the shipyard's location on at the interface of the three media, almost all environmental laws effect our operations. A very brief summary of the most important federal statutes is provided below.

Act to Prevent Pollution from Ships. The Act to Prevent Pollution from Ships was enacted in 1980 to implement the agreements made at the Protocol of 1978 and the International Conference for the Prevention of Pollution from Ships of 1973. Both conventions were held in London to discuss local and international laws governing the discharge of oil and oily waste from marine vessels. In accordance with this Act, new ships must be designed to reduce the chance of oil spills and eliminate the discharge of oily waste during operation. Specific reporting of solid waste discharges and ballast releases were established, as well as specific operations, inspection and certification requirements. This Act also requires that heads of certain federal departments prescribe standards for ships under their authority, which are reasonable and practicable, without impairing the operations or operational capabilities of such ships.

Clean Air Act. The Clean Air Act of 1970 was designed "to protect and enhance the quality of the Nation's air resources so as to promote public health and welfare.…" In accordance with this Act, the Environmental Protection Agency (EPA) is required to monitor air emissions and issue permits to ensure that specific air standards are met. Amended in 1990, this Act is now significantly stronger and establishes specific goals and timetables for reducing air pollutants. Federal and State agencies are making a cooperative effort to reduce pollutants at their source. To achieve compliance, market incentives and increased fines have been incorporated into this Act which encourage industry to take a proactive approach to meet and exceed these standards

Clean Water Act. The Clean Water Act of 1977 (CWA), formally known as the Federal Water Pollution Control Act, authorizes the EPA to regulate the control and prevention of surface and ground

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water pollution. The CWA addresses the regulation of both domestic and industrial wastewater. The primary tool for the management of wastewater is the National Pollutant Discharge Elimination System (NPDES). NPDES permits are issued by the EPA unless the State in which the discharge is located has been given authority by the EPA to issue permits. Permits are required for industrial activities as well as facilities treating domestic wastewater. NPDES permits usually contain limits on the quantities of specific pollutants which can be discharged from the permitted point source, as well as sampling, chemical analysis, and reporting requirements.

Comprehensive Environmental Response, Compensation and Liability Act. In response to increased public concern over the dumping of chemical wastes, Congress passed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1980. This Act established a $1.6 billion dollar fund for cleaning up old waste spill and storage sites. The purpose of this fund was to expedite the remediation of our nation's worst waste sites, while seeking compensation through litigation from the persons responsible. This fund soon proved inadequate to fix a severe and costly problem. Subsequently, the Superfund Act of 1986 was approved and contributed $8.5 billion to the fund. While CERCLA lacked adequate funding and legal strength, it established the groundwork for determining legal liability for all those who "caused or contributed to a release of hazardous wastes."

Emergency Planning and Community Right to Know Act. The Emergency Planning and Community Right to Know Act of 1986 (EPCRA), also known as SARA Title III, requires immediate notification of State and local authorities in the event of a release of a hazardous material. Congress enacted this law to help local communities protect public health, safety, and the environment from chemical hazards. EPCRA is designed to "provide a basis for each community to develop a chemical release preparedness and planning program that suits its individual needs" and to "provide the public with the identity, quantity, location and properties of hazardous substances in the community." By establishing emergency planning and notification requirements as well as hazardous substance notification procedures, EPCRA is designed to increase community awareness and minimize the effects of authorized and incidental releases.

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Federal Facilities Compliance. The Federal Facilities Compliance Act of 1992 was designed to amend the Solid Waste Disposal Act so as to waive the sovereign immunity of federal agencies. This legislation requires federal facilities to comply with all federal, state and local hazardous waste management requirements. In accordance with this Act, federal agencies have the responsibility to take a leading role in reducing pollution and informing the public of toxic and hazardous chemicals at federal facilities. Federal agencies are no longer exempt from the fines and penalties that the EPA and states use to enforce compliance with hazardous waste laws with respect to non-governmental facilities (i.e., privately owed shipyards). Specifically, the head of each federal agency must perform an initial assessment of toxic releases and develop a plan to achieve compliance with the Pollution Prevention Act and EPCRA. Starting in 1995, federal agencies will begin submitting progress reports to the EPA. The goal of this Act is to protect human health and the environment by making the federal government accountable for its environmental record.

Federal Insecticide, Fungicide and Rodenticide Act. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) authorizes the EPA to regulate the manufacture, distribution, importation, and use of pesticides. Broadly defined, a pesticide is any agent used to kill or control undesired insects, weeds, rodents, fungi, bacteria, or other organisms. The term "pesticides" includes insecticides, herbicides, rodenticides, fungicides, nematicides, acaricides, as well as disinfectants, fumigants, and plant growth regulators. FIFRA requires pesticide manufacturers to register all active ingredients of pesticide formulations. Many types of antifoulant coatings applied to the underwater hulls of ships are classified as pesticides, and subject to federal and/or state pesticide regulations.

Hazardous Materials Transportation Act. The Hazardous Material Transportation Act (HMTA) of 1974 authorizes the Secretary of Transportation to protect the nation against the risks to life and property that are inherent in the transportation of hazardous materials in commerce. In accordance with this Act, the Department of Transportation (DOT) is authorized to issue regulations governing the safe transportation of hazardous materials in intrastate, interstate, and foreign commerce. The hazardous materials regulations include requirements for: material classification; identification and packaging; transportation and handling; and incident reporting. In 1990, the Hazardous Material Uniform Safety Act of 1990 was enacted to require training and to ensure safe handling of hazardous materials.

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This amendment to the HMTA established specific training requirements for employees who work with hazardous materials, and specified dates by which these training requirements must be satisfied.

National Environmental Policy Act. The National Environmental Policy Act (NEPA) requires federal agencies to consider the environmental impact of proposed actions in their planning and decisions. For major federal actions which will significantly affect the quality of the environment, NEPA requires federal agencies to prepare detailed statements, termed "Environmental Impact Reports" regarding such considerations and the resulting recommendations. Projects that could prompt NEPA review include: large dredging projects; constructions of major new installations; major land acquisitions; changed use of the property; construction of new sanitary landfills; and disposal of toxic substances.

Oil Pollution Act. In 1990, Congress passed the Oil Pollution Act to expand the scope of oil pollution prevention and response activities to all "oil discharge facilities" which pose a potential harm to navigable waters. This Act amended the Clean Water Act to augment federal authority, increase fines, and emphasize preparedness and prevention. It increased the number of regulated activities by including both transportation and non-transportation related facilities in close proximity to water sources. In accordance with this Act, the EPA required that all "substantial harm facilities" submit a local response plan for approval by February 18, 1993 or stop handling, storing, or transporting oil. This Act also provided specific guidance on how to develop response plans.

Pollution Prevention Act. The Pollution Prevention Act of 1990 established that it was the national policy of the United States to prevent and reduce pollution at the source, whenever feasible. Pollution which cannot be prevented should be recycled, and that which cannot be recycled or prevented should be treated and disposed of in an environmentally sound manner. The Pollution Prevention Act encourages source reduction of all types of waste, not just hazardous wastes. In accordance with this Act, the EPA has established an office to promote pollution prevention and assist businesses in adopting pollution prevention techniques. The EPA must consider the impact of new projects on source reduction efforts. Facilities that are currently required to file annual toxic chemical

release inventories must now include information on the their toxic chemical source reduction and recycling efforts.

Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendment Act (HSWA), authorizes the EPA to regulate the management, treatment, storage, and disposal of hazardous waste. Waste products are classified as hazardous if they exhibit the characteristics of ignitability, corrosivity, reactivity, or toxicity **or** if they are listed as a hazardous waste in the regulations. The major intent of RCRA is to promote "cradle-to-grave" management of hazardous waste, to reduce the amount of hazardous waste generated, and **to minimize** the detrimental impacts of hazardous waste on the environment. RCRA and HSWA also established standards for the management of underground storage tanks and used oil, and land disposal restrictions which encourage treatment in lieu of disposal.

Safe Drinking Water Act. The Safe Drinking Water Act (SDWA) authorizes the EPA to regulate drinking water. The EPA sets standards which must be met by all drinking water supplied to the public. The facility that supplies drinking water is responsible for ensuring that the water meets these standards. The drinking water program was established under the premise that the EPA would authorize the States to carry out and enforce the program. The requirements of the SDWA apply to all public water systems. A public water system is one which serves piped water to at least twenty-five people or fifteen service connections for at least sixty days of the year. Public water systems are divided into two categories; community water systems and non-community water systems. A community water system serves people year-round, (i.e., city or town), whereas a non-community water system serves people only a portion of the time (i.e., motel or campground). Different requirements apply to each type of water system.

Superfund Amendments and Reauthorization Act. It became apparent in 1985 that the original funding for cleaning up waste sites authorized under CERCLA was inadequate. Although 14 sites had been cleaned up, the National Priority List of sites in need of remediation continued to grow. The Superfund Amendments and Reauthorization Act (SARA) of 1986 contributed $8.5 billion to the fund. SARA established the Defense Environmental Restoration Account (DERA) to fund the clean-up of Department of Defense waste sites. Title III of this Act established specific reporting and

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planning requirements for businesses that handle, store, or manufacture hazardous materials. Among these requirements are specific methods for reporting incidental leaks and spills, planning for emergency response, and monitoring ongoing releases. In 1991, a reauthorization approved an additional $1.8 billion per year to the fund through 1994.

Solid Waste Disposal Act. The Solid Waste Disposal Act (SWDA) authorizes the EPA to regulate the management, treatment, storage, and disposal of solid wastes. Solid waste includes household, municipal, commercial, and industrial refuse. Solid waste encompasses hazardous and nonhazardous waste, including medical waste. Solid waste can take gaseous, liquid, or solid form. The federal regulations promulgated under SWDA focus on non-hazardous wastes, commonly known as trash or garbage. The EPA regulates solid waste collection, storage, recycling, incineration, and land disposal. The EPA requires mandatory procurement of certain recycled materials by federal government agencies. State and local authorities also regulate solid waste disposal.

Toxic Substance Control Act. The Toxic Substance Control Act of 1976 (TSCA) was enacted by Congress to test, regulate, and screen all chemicals produced or imported into the U.S. Most environmental regulations address problems associated with the management of hazardous substances after the substances have served their useful purpose (i.e., how do we dispose of the waste?). TSCA addresses substances while in use, and in some cases, prohibits their manufacture or importation. A major intent of this Act is to prevent problems before they occur, rather than solve them at the "end of the pipeline." Manufacturers of new chemicals must provide the EPA with 90-day advance notification of their intent to manufacture, unless excluded by TSCA. Significant new uses for existing chemicals require the same notification. In addition to these general requirements, TSCA addresses specific hazardous chemical substances. These substances include polychlorinated biphenyls (PCBs), which are commonly used as dielectric fluids in transformers and capacitors; asbestos, which is used in applications requiring heat resistant material; chlorofluorocarbons (CFCs) used as refrigerants; certain metalworking fluids; certain water treatment chemicals; dioxins; and furans.

Shipyards are subject to literally thousands of environmental regulations. It is not your job to know them all, or how they may

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apply in every situation. However, it is everyone's job to know how their own particular work tasks and job processes must be performed in order to protect both the environmental and the economic viability of the shipyard.

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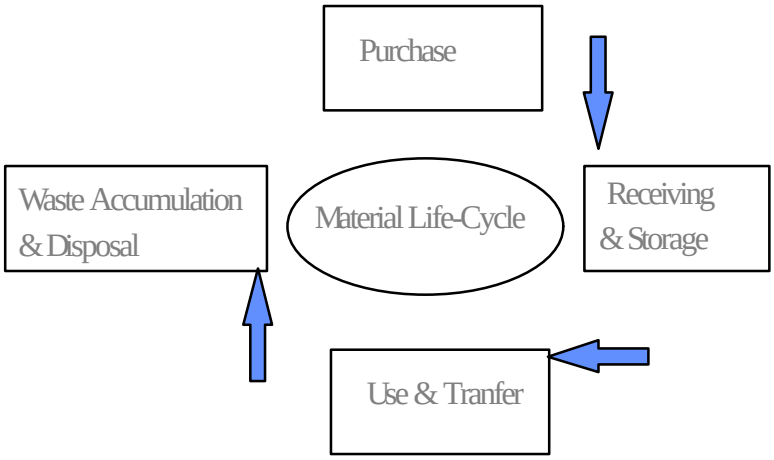
NOTES:

OBJECTIVE

Increase personal safety and environmental preservation through the proper handling of hazardous materials.

THE HAZARDOUS MATERIAL HANDLING LIFE CYCLE

Material handling practices form the basis for environmental protection and worker chemical safety. Materials need to be handled in such a way that chemical products and other potentially hazardous materials do not get into the environment or cause exposures to workers. Examine the life cycle of materials in the shipyard and how each element of that life cycle has the potential to reduce the shipyard's costs and environmental liabilities.



MATERIAL PURCHASE

- Avoid ordering hazardous materials in amounts greater than needed for your specific job task. Any purchase savings realized by ordering in bulk quantities can easily be negated by the cost of disposing of unused out-of-spec materials. Avoid ordering excessively hazardous substances when a more "environmentally friendly" product can be used.

PROPER HAZARDOUS MATERIAL HANDLING

NOTES:

MATERIAL RECEIVING AND STORAGE

- Store material inventory by chemical compatibility. Provide secondary containment to prevent spills from contaminating other products or the environment. Follow good safety practices and use proper storage equipment to store drums or other bulk containers.

MATERIAL USAGE AND TRANSPORTATION

- Before transporting hazardous materials or products, ensure that the containers have secured lids or seals. Properly label the material to ensure the receiver can identify the shipment. Use nylon straps or rope, shrink wrap, containment pallets or other methods to reduce the potential for spills and accidents during transport. Do not overload the truck or forklift with more than a safely manageable quantity of product. Ensure deliveries are made to the correct work site and are staged in a safe location.

Material Transfers and Usage - Perform transfer and mixing operations only in designated areas, using secondary containment such as drip pans. When using pumps and hoses to transfer materials, always flush the lines before breaking connections. Place a drip pan or bucket under the connection when breaking down in order to catch any spillage. Label all personal use containers prior to transport from the transfer and mixing area to the job site use area. All containers must be properly sealed except when adding or removing material. Only prepare the amount you need to perform your current job task.

Material Disposal - Return any unused or excess material to inventory, if it still meets spec. Non-spec excess material should be returned to the appropriate department for consolidation and disposal. Never discard waste materials into trash or solid waste bins unless you are certain they are non-hazardous. If you are uncertain, get guidance from your supervisor or qualified company personnel.

Good material handling procedures and practices protect the environment, workers, and the shipyard, by preventing chemicals from getting into the ground, air and water, or people.

PROPER HAZARDOUS MATERIAL HANDLING (Cont.)

NOTES:

OBJECTIVE
Identify specific hazards of chemicals used within the shipyard.

CHEMICAL HAZARDS IN THE SHIPYARD

KNOW THE CHEMICAL HAZARDS IN YOUR AREA
Most of the chemicals found in shipyards fall into one or more categories: flammable; corrosives; toxics; and reactives.

NOTES:

Flammables

- Materials that pose a hazard because they readily ignite. These chemicals fall into a series of classes depending on their physical characteristics. A *Class I* flammable liquid is any liquid that has a flash-point below 100^{o} F. A *Class II* liquid has a flash-point greater than 100^{o} F. A *combustible* liquid has a flash-point above 140^{o} F. Essentially, flammable chemicals usually can be ignited at normal room temperatures, while combustible chemicals must be heated to their flash-point temperatures before they ignite.

Corrosives

- Materials that usually cause the destruction of living tissue, like skin and eyes, during exposure. Similarly, they can cause the destruction of non-living materials such as wood and steel. Corrosives fall into three categories: *acids; bases; and solvents*. Acids cause burns because they react with the proteins, carbohydrates, and fats that compose living tissue. Bases, or caustic solutions, degrade the proteins and fat in the skin leading to desensitization and damaged tissue. Solvents can redden and roughen skin to the point of causing dermatitis.

Toxics

- Materials can damage your overall health, either immediately or after some period of time ranging from months to years. Exposures vary depending upon toxicity. Acute toxicity is an exposure in which the reaction to the exposure is immediately noticeable, or apparent within minutes/hours after the exposure. Chronic toxicity is opposite to acute. The response to the exposure is delayed, and may not be noticeable until months or years after the initial exposure. All materials can be toxic. It is the dose that determines the response.

Reactives

- Materials can react violently or dangerously with other common materials such as air, water, or themselves (self-polymerizing). Water reactive materials will generate extreme heat and may explode when introduced to water. Air reactive materials will burn vigorously in air, and may also explode. Self-polymerizing materials will burn vigorously in air, and may also explode. Self-polymerizing materials are typically two-part (A/B) systems, that when mixed in disproportionate amounts, generate large amounts of heat.

MSDS AND CHEMICAL LABELS

All chemicals can be used safely if you understand the hazards and follow the rules of chemical safety. The first source of information on the chemical hazards of a product is the label. The label will identify the product, physical and health hazards, and safe use instructions. Always follow the manufacturer's instructions for storage and use. The second source of information is the Material Safety Data Sheets ("MSDS") for a product will provide more detailed information on product hazards and procedures for safe usage. Review the MSDS prior to using any product for the first time, or if you are unsure about the hazards or proper safety precautions.

CHEMICAL HAZARDS IN THE SHIPYARD
(Cont.)

NOTES:

HAZARDOUS MATERIAL CONTAINER LABELING

NOTES:

OBJECTIVE

To understand the importance of maintaining proper labeling of hazardous and non-hazardous materials, products and/or waste.

ENSURE PROPER LABELING IN YOUR AREA

All containers need to be labeled to correctly identify their contents. Without this information, it would be easy to mistake the contents of a bottle, can, drum or box for another product or material. This type of mistake can result in production delays, rework, personal safety chemical exposures, environmental accidents, excessive waste and increased disposal costs. To prevent these problems, always adhere to the following good environmental practices for labeling containers:

GOOD ENVIRONMENTAL PRACTICES

UNDERSTAND AND LABEL CHEMICALS HAZARDS

- Identify any product hazards on the label, such as **FLAMMABLE** or **POISON**. Use the signal words: **DANGER!, WARNING**!, or **CAUTION** to identify the degree of hazard.
- Leave the original product label intact during storage and use. Always know where the MSDS is located.
- Read the container label before each use, transfer, or mixing operation to ensure you have correctly identified, and are using, the right product.
- If the original label is removed, use preprinted adhesive labels to identify the product rather than writing directly on the container. Adhesive labels can be removed if the contents of the container are changed. If transferring or mixing products, ensure that the new container is clearly labeled.
- Never turnover an unlabeled container to another worker, another shift or another department. All containers with hazardous materials must be labeled.

WASTE LABELING

- Apply a **HAZARDOUS WASTE** label only when directed by qualified company personnel, unless you have been tasked and trained to perform hazardous waste duties.

- Use a **WASTE** label to identify when a container's contents no longer meet "spec" or cannot be used for its intended purpose.

EXAMPLE SITUATION

- In the event of a spill or personal chemical exposure, it is imperative that the first emergency coordinator knows the type and nature of the chemical involved. A proper chemical label will provide the necessary information to clean-up the spill or attend to the chemical exposure (wash eyes with water). If the label is not on the container, valuable time may be lost searching for the MSDS to identify proper actions.

HAZARDOUS MATERIAL CONTAINER LABELING
(Cont.)

NOTES:

OBJECTIVE

Maintain and clean and organized shipyard to minimize the likelihood for accidental pollution. This mean that the entire shipyard, as well as your immediate work area, should be kept clean and well organized.

KEEP YOUR WORK AREA CLEAN AND ORGANIZED

Keeping your work area clean and organized creates efficiency, allowing you to perform your duties without immediate distractions. It further allows for other subsequent shift workers to complete their tasks without housekeeping problems. Ultimately it makes your job easier.

"Good Housekeeping" is the practice of maintaining a clean, well-defined work space. It means keeping the immediate area where you perform your work free of trash, debris, and other similar materials. This is important because it maintains your work area (shipyard, office, warehouse, etc.) in a clean, professional, and safe manner. It promotes an efficient working environment, and it minimizes or prevents the discharge of **pollutants** into the environment.

Pollutants are objects, materials, chemicals, products, and/or waste that can contaminate air, water, and/or land, if released into the environment. Some examples of pollutants are foam coffee-cups, napkins, rags, paints, solvents, abrasive blast-grit, cigarette butts, cans or bottles. Anything can be a pollutant if it is disposed of in the wrong place.

GOOD ENVIRONMENTAL PRACTICES

EXAMPLE SITUATIONS

- Leaking equipment is one other example of poor housekeeping. If you discover leaking equipment, lines or hoses, you should take appropriate corrective action as soon as possible. Notify your supervisor or the appropriate maintenance department that the equipment requires repair. Clean-up any spilled or leaked material immediately if your are properly trained for clean-up.

- Small leaks may result in serious consequences. Another worker in the area could slip and injure him or herself. If not cleaned up, spills could run-off into a nearby storm drain, pier or dry dock basin, then ultimately drain into the surrounding water.

GOOD HOUSEKEEPING

NOTES:

GOOD HOUSEKEEPING (Cont.)

- Keep the chemical product containers you are using in an organized manner, and under control. Keep the lids in place at all times, (even on empty containers), when you are not removing, adding or mixing product. Note: Empty containers should be separated and sent to the waste yard for scraping or disposal. Partial or full containers sometimes may be returned to inventory if the product still meets manufacturer's specifications.

- All grit blast material and paint overspray should be swept up and properly disposed as soon as practical. Wind and rain can come into contact with this material and can be transported into the local environment.

NOTES:

POLLUTION PREVENTION AND POLLUTION PATHWAY ANALYSIS

NOTES:

OBJECTIVE

To enlighten shipyard employees about pollution pathway analysis and their local environmental surroundings. Shipyard personnel are to identify potential pollution pathways in their work-scope.

Within the shipyard their are a variety of chemicals and hazardous materials that can be transported to surface waters if an accident should occur. Accidents involving chemical or hazardous material spills can occur at any time or place in the shipyard. Areas that pose a significant risk are those which have direct pathways leading to adjacent surface waters.

All employees must be aware of possible spill pathways. Storm drains are located throughout the shipyard. All storm drains discharge to adjacent surface waters. Only storm water is allowed to discharge into the storm drains (unless otherwise permitted by Environmental Engineering).

1) Air Pollution to Land Pollution

2) Air Pollution To Water Pollution

3) Water Pollution to Sediment Pollution

4) Land Pollution to Water Pollution

5) Solid Waste to Land Pollution

Major potential water pathways are utility trenches, direct runoff channels, pier scuppers, sally ports, vessel decks, and unsealed manholes.

OBJECTIVE

To minimize the release of vapors and dusts into the atmosphere, which may be harmful to employee health, public health, and the environment.

AIR QUALITY HEALTH CONCERNS

Shipyards utilize a wide variety of production operations and equipment for shipbuilding and repair that have the potential to release harmful fumes and dusts. Production processes include welding, painting, degreasing, abrasive blasting, and several other operations. In addition, production equipment such as boilers, internal combustion engines, and furnaces are an essential element of any shipyard and produce emissions. These shipyard operations and equipment produce air emissions that may adversely affect employee health, the public, and/or the environment. Although, in some cases, emissions produced by shipyard operations and equipment are not considered immediate health risks to employees, especially when proper safety equipment is used. Also, public exposure to shipyard emissions is primarily location specific and usually considered minimal. It is always desirable to minimize air pollution due to compounding effects with outside emission sources such as other industries and automobiles.

SHIPYARD EMISSION TYPES

Several types of emissions generated by shipyard operations potentially include criteria pollutants and hazardous air pollutants (HAPs). Criteria pollutants are a major category of air pollutants that include Oxides of Nitrogen (NOX), Carbon Monoxide (CO), Oxides of Sulfur (SOX), volatile organic compounds (VOC), Lead (Pb) and Particulate Matter (PM and PM_{10}).

PUT A LID ON IT!

Paints, thinners, solvents, degreasers, adhesives, sealant, etc. are just a few of the chemicals used in the shipbuilding and repair activities. And many of these chemicals emit vapors called Volatile Organic Compound (VOC) into the atmosphere. VOC's contribute to formation of smog in the atmosphere. There are simple and effective ways to prevent VOC's from being emitted into the air:

- Put a lid on the container when you are not using the material. If you need to leave your work area for a tool, lunch, or any other reason, put the lid on.

VOCs AND OTHER AIR QUALITY CONCERNS

NOTES:

- Keep equipment covers closed. Keep degreaser, Safety-Kleen, and other cleaning equipment covers closed when not in use.
- Do not store brushes, rollers, etc. in covered solvent containers.
- Keep solvent and oil laden rag container covers closed.

VOCs AND OTHER AIR QUALITY CONCERNS (Cont.)

KEEP DUST UNDER CONTROL:

Dust particles are commonly referred to as Particulate Matter (PM). PM emissions result from most shipyard operations including Painting, Welding, Abrasive Blasting, Grinding and Sanding. These emissions can have adverse effects on employee health as well as the environment. There are some easy steps that can be taken to minimize the amount of PM emission that become airborne.

- Use containment curtains to control dusts
- Use processes that produce less dust
- Perform dust generation activities in a manner that minimizes airborne dust
- Do not perform the operation in windy conditions or block the operation from the wind
- Keep area swept clean to minimize the likelihood of materials becoming airborne.

NOTES:

OBJECTIVE

Eliminate the discharge of pollutants into the surface waters, storm drains, sewers, sinks, toilets, grounds or air.

UNDERSTAND DUMPING AND PREVENT IT

The discarding of pollutants into storm drains, surface waters, sinks and toilets, or onto the grounds is unacceptable and illegal. Pollutants consist of paints, solvents, oils, trash, abrasive blast material, detergents, etc. The dumping of a pollutants into a storm drain means a discharge to adjacent surface waters. The dumping of pollutants onto the ground can enter surface waters by wind or rain runoff. Liquid spills if not cleaned up immediately can soak into the soil and eventually reach surface and/or ground water. Dumping of pollutants not only includes directly discharging pollutants to the water, air or ground, but also includes irresponsibly placing the pollutant where it is likely to get transferred to the air, grounds, or water.

WHAT IS A POLLUTANT?

- **Pollutants** are any material, chemical or product in the "wrong" place in the environment. In the shipyard, there are many materials that could be pollutants if they are "dumped" in the wrong place. These materials include paints, solvents, detergents, oils, greases, adhesives, abrasive blast, rags, trash, paper, cigarette butts, or any waste material not properly managed.

GOOD ENVIRONMENTAL PRACTICES

DO NOT DUMP INTO:

Surface Waters

- Many pollutants can damage the living species in our oceans, bays and rivers. Do not dump any pollutants into the surface waters!

Storm Drains

- All storm drains lead to surface or ground waters, not to treatment plants. Dumping pollutants into or near storm drains will result in their discharge to water or ground. Never dump pollutants or waste into storm drains!

NO DUMPING!

NOTES:

Sinks and Toilets

- Sinks and toilets discharge to a treatment plant or septic tank. Dumping pollutants into either results in pollutants getting into the environment, and is usually illegal as well. Do not dump pollutants or industrial wastes into sinks or toilets!

Facility Grounds

- Dumping pollutants onto the ground will result in their contamination of the soil, or transport by storm waters to surface waters. Clean up all spill immediately. Do not dump wastes or pollutants on the ground!

DUMPING IS ILLEGAL - BE RESPONSIBLE:

- All employees shall be committed to preserving state waters and the environment. Employees are asked to take part in this shipyard's commitment to preserve the environment by not dumping. Be aware that illegal dumping of pollutants is a violation of Federal and State Environmental Laws. Environmental regulating agencies will fine and/or imprison individuals and companies for illegal dumping.

NO DUMPING! (Cont.)

NOTES:

OBJECTIVE
To follow simple practices that can help minimize paint spills that cost companies time and money.

MINIMIZING SPILLS SAVES TIME AND MONEY
Remember the old saying - **"An ounce of prevention is worth a pound of cure."** Application of this idea to paint materials handling means that YOU can take steps to minimize the potential for spills and unnecessary releases. As you know, spills take a long time to clean-up and paint materials are very expensive. Use time more effectively by minimizing the likelihood that a spill will take place in your area.

Minimize the potential for spills in your area by following the listed good environmental practices.

GOOD ENVIRONMENTAL PRACTICES

MSDS REVIEW AND UNDERSTANDING

- Review the hazards associated with the material being used and the prescribed clean-up procedure.

CONTAINER MANAGEMENT

- Always keep paint containers closed when not in direct usage (i.e. lids on and tight). Containers with out lids are an accident waiting to happen.

- Do Not dent or damage containers during your working process. Also only use containers that are in good condition at all times.

- Store hazardous material containers and associated equipment on sturdy, flat surfaces.

QUANTITY CONTROL

- When possible handle the smallest quantity necessary for the job.

CONTAINMENT PRACTICES

- Whenever practical, provide secondary containment around the containers that is large enough to hold the contents of the largest container. If a spill were to occur, the secondary would prevent discharge to surface waters and allow for easier spill clean-up.

MINIMIZE THE POTENTIAL FOR PAINT SPILLS

NOTES:

AREA HOUSEKEEPING AND INSPECTIONS

- Be aware that spills can occur and maintain your area to minimize the potential (i.e. organize your area).
- Perform inspections of all material storage, work areas, and waste accumulation area. Ensure that they are organize in such a way that minimizes the potential for spills.

IMPROVED LIQUID TRANSFER OPERATIONS

- Use funnels, splash guard, and secondary containment when transferring hazardous materials and waste from one container to another.
- Provide proper grounding when transferring flammable materials.

MINIMIZE THE POTENTIAL FOR PAINT SPILLS (Cont.)

NOTES:

IN YARD HAZARDOUS MATERIALS/WASTE TRANSPORTATION

NOTES:

OBJECTIVE

To minimize the likelihood of spills and other hazardous accidents during the transportation of hazardous materials and wastes throughout the shipyard.

IN-YARD HAZARDOUS MATERIAL TRANSPORT

Shipyard personnel transport hazardous materials and waste throughout the entire facility using a variety of equipment. Transportation equipment consists of forklifts, trailers, trucks, cranes, mule trains and others. In many cases, the surface of the roadways can vary from smooth to extremely rough (i.e., rail tracks, storm drains, etc.) throughout the shipyard and spills can occur if the loads are not properly secured and driving precautions are not observed.

PACKAGING ISSUES

In many cases, proper packaging will require the hazardous material to be shrink-wrapped, strapped or otherwise secured to the transportation pallet. It is always a good idea to package pallets such that they are not over-loaded. Over-loaded pallets are an accident waiting to happen.

GOOD ENVIRONMENTAL PRACTICES

PROPER PACKAGING FOR TRANSPORTATION

- Materials shall not be transported unless they are properly prepared for transportation. This may include: properly secured lids, plugged bungs, proper strapping, and others.

- Material and waste can be secured to transportation pallets be using cellophane wrap, nylon straps and rope, walled containment pallets, or some other method that minimizes the potential that the load spills during transportation.

- Material and waste pallets shall be kept to a manageable load size while being transported. A general rule of thumb is that 5 gallon cans should not be stacked over 3 cans high.

- The individual who packages the waste should perform a series of stability tests prior to transportation. Stability tests are meant to imitate conditions experienced by the load on a forklift. Stability tests could include simple shaking, pushing, and pulling efforts that test the load packaging.

LABELING FOR TRANSPORTATION

- All hazardous materials and wastes shall be labeled in accordance with federal, state and local requirements.

SPILL PREPARATION

- Transportation employees shall be aware of the risks and response procedures associated with spilling hazardous materials and wastes. They shall be aware of emergency spill notification procedures.

MATERIAL COMPATIBILITY

- Materials transported on pallets shall be compatible with one another (see GEP on Material Compatibility).

IN YARD HAZARDOUS MATERIALS/WASTE TRANSPORTATION

NOTES:

OBJECTIVE
Ensure quick and safe response to hazardous materials spills in the shipyard.

DETERMINING THE REQUIRED RESPONSE
Spills of materials or products in the shipyard will fall into one of two response categories. The first type is spills that can be cleaned up by area workers, without using special protective equipment or procedures. The second category of spills are those that require trained personnel, protective equipment and special procedures, to clean up. There are three important factors that determine what response category a spill belongs.

These three important factors are:

1) The hazards of the spilled material.

2) The volume of the spilled material.

3) The location of the spill.

WHAT I NEED TO KNOW

REPORTING SPILLS TO ON-SITE MANAGEMENT

- Report spills above a 5 gallons to on-site environmental personnel. Future reporting to regulators may be necessary.

CLEAR THE WORK AREA

- Clear the work area of employees they may be exposed to immediate threats such as fire, explosion or toxic fumes.

CONTROL THE SPILL

- Control the spread of the spillage if possible. Block the spill pathway to the ground, water, or storm drains. Although, do not attempt to stop the flow unless you know it can be done without putting yourself or other workers in jeopardy.

DISPOSE OF WASTE CORRECTLY

- Remember that when hazardous materials are spilled, the residue is always a *hazardous waste*. Never put spill clean-up materials into a trash bin. You must properly containerize the residue, label the container and transport to a storage facility for disposal.

EMPLOYEE LEVEL SPILL RESPONSE

NOTES:

EXAMPLE SITUATIONS

- A spill of a low hazard material, in a small amount, such as a few gallons or less of hydraulic fluid, in a location that is not an immediate threat to people or the environment, can be cleaned up by area workers.

- A large volume spill of a high hazard material, such as a 55 gallon drum of flammable solvent, in a location where people or the environment maybe injured requires a quick response by trained personnel.

EMPLOYEE LEVEL SPILL RESPONSE (Cont.)

NOTES:

SECONDARY CONTAINMENT

NOTES:

OBJECTIVE

To identify the "secondary containment" requirements and systems to be used in the shipyard and promote their use in preventing hazardous materials spills and leaks. Also, to ensure that secondary containment systems are in place to catch accidental spills, leaks, and splashing of chemicals and wastes.

WHAT IS SECONDARY CONTAINMENT?

Secondary containment is the use of any practice, equipment or system that prevents spills or leaks from containers or equipment from getting into the environment. Secondary containment is used to catch accidental spills, leaks, and splashes, should the primary container or equipment leak, spill or puncture. The primary container is the drum, tank, or can that a material or waste is stored. Secondary containers are found all over the shipyard. Drip pans, bermed areas, containment pallets and sand bags are examples of secondary containment systems. In the shipyard, secondary containment facilities can range from contained dry dock areas to tarps and liners to drip pans. Secondary containment systems can either be permanently installed or portable.

By breaking the "pathway" of the spill or leak to the ground or water, secondary containment prevents pollution and/or expensive clean-ups. It improves production efficiencies by reducing re-work, down-time and clean-up time when the work is done. Secondary containment should be used whenever storing, transporting or using hazardous materials or products.

EXAMPLE SECONDARY CONTAINMENT

- Material inventory racks with a sealed bottom and lips.
- Mixing paints in a designated area that is sealed and bermed.
- Dry dock troughs, dip pans, containment pallets, plastic tarps, paved and bermed areas, and sand bagging are all examples of shipyard secondary containment systems.
- Placing a plastic tarp and sand bag berm under and around portable equipment such as generators or air compressors.
- Containment pallets

- Double walled piping and tanks.
- Drip pans under valve and pump connections during oil transfer operations.
- Using container over-packs during use or transport.
- When cleaning parts and equipment use secondary containment system such as bermed plastic sheeting, drip pans or canvas tarps.
- Provide separation between secondary containment systems that contain incompatible hazardous materials or wastes.

SECONDARY CONTAINMENT (Cont.)

NOTES:

LIQUID STORAGE AREAS

NOTES:

OBJECTIVE

Provide an area where hazardous liquids can be stored that will help ensure potential spillage from containers such as paint cans, solvent drums, and oil drums does not soak into the underlying soils or enter nearby surface waters.

HAZARDOUS MATERIALS AND WASTES STORAGE

Dangerous liquid wastes or materials such as fuels, paints, solvents, acids, caustics, etc. should be stored in a area that can contain the material in the event of a spill or container leakage.

CONTAINMENT AREA CURB, DIKE, OR BERM

- The containment area should be surrounded by a curb, dike, berm that is sufficient to contain spills and leaks. The berm must be combined with an impervious surface, such as plastic, concrete and sealed asphalt. Ensure that the diking system makes a complete seal with the surface of the containment floor. For example, asphalt dikes/curbs need a sealer in-between the floor surface and the curb. If a sealer is not used, leaks can occur at the interface.

CONTAINMENT AREA SURFACE

- All paved storage areas should be free of cracks and gaps, and should be sufficiently impervious to contain leaks and spills until they can be addressed.

- Concrete is usually good for all types of hazardous materials and liquids.

- Asphalt is not always adequate for use as a surface to contain fuels or other hydrocarbons.

- Plastic surfaces should only be used when it is compatible with the materials stored

CONTAINMENT AREA CONTROLS

- Inside the contained area, the surface could be sloped towards a drain which is used to drain spills and rainwater. Some yards may choose to incorporate a blind sump in their containment area to recover spilled material. The blind sump is good for centralizing the spilled materials and utilizing a pumping system when appropriate.

- The drains in storage areas could have positive controls. For example, a closed drainage valve or plug (with management practices/procedures for controlling spills). When practicable, storage areas should have sloped roofs to minimize the amount of rainwater buildup inside the contained area.

LIQUID STORAGE AREAS

NOTES:

CONTAINMENT AREA VOLUME

- Ensure that the secondary containment to provide sufficient volume to help contain possible spills and leakage. In many shipyard situations, the volume of the containment is a function of shipyard policy.

- In some cases secondary containment volume is regulates. For example, large permanent tanks require that the volume of the secondary containment area should be 110% or the largest container or 10% or the total material contained, Whichever is Greater.

ENSURE THAT

- Storage of reactive, ignitable, or flammable materials will comply with all local and state fire codes.

LIQUID STORAGE AREAS
(Cont.)

NOTES:

OBJECTIVE
Identify proper management of common shipyard wastes.

KNOW HOW TO MANAGE THE WASTE IN YOUR AREA
Proper management of waste is critical to the environment and the shipyard industry. Trash and solid waste disposal costs can have a large impact on the cost of the job. Improper disposal of hazardous waste can have even more serious consequences, ranging from fines to criminal prosecution. It is vital that all shipyard workers know and use good waste management practices.

GOOD ENVIRONMENTAL PRACTICES

Contaminated Rags

Solvent, paint or oily rags must not be put in trash or solid waste containers. These waste materials must be placed in hazardous or segregated waste drums.

Empty Paint and Coating Cans

Do not pour any paint or coating residue into storm drains, sewers, sinks or on the ground. Excess material should be considered to be hazardous waste until qualified personnel make a "waste determination". Empty cans containing a dried residue may also be hazardous waste, depending upon the contents and amount remaining. If practical, cans with no free liquid or dried residue should be recycled as scrap metal.

Used Oil and Lubricants

These wastes are often hazardous wastes but can usually be recycled if not contaminated with solvents or other hazardous wastes. They should be collected in designated drums or tanks, by type of waste material, and held for recycling or disposal.

Spent Solvents

Degreasing and cleaning solvents must never be disposed of in storm drains, sewers, sinks or trash bins. This includes not only chlorinated and petroleum based solvents, but also citrus and other "natural" biodegradable solvents. The solvent itself may be non-hazardous, but the spent solvent will contain the oil, grease, metals or other hazardous contaminates it picked up during use.

MANAGING COMMON SHIPYARD WASTES

NOTES:

MANAGING COMMON SHIPYARD WASTES (Cont.)

NOTES:

Spent Blasting Media

Various types of blasting media are used in the shipyard. Large quantities of spent abrasive media are generated during exterior and interior vessel blasting. While the virgin blast material may be non-hazardous, the spent blast may contain toxic metals derived from the substrate and/or coating that was blasted. Do not dispose of spent abrasive blast into regular trash bins. Collect the spent media and store in designated areas or containers.

Scale and Wax

Scale is a mixture of paraffin type waxes, oils and oxidized metals, and is found in some types of vessel tanks. When it is removed during repair operations it becomes a "waste." Scale should never be mixed with other wastes or trash. If a waste determination shows the scale to be hazardous, it must be managed as a hazardous waste. It can also be recycled in a fuel blending process for cement kilns or facilities that require high Btu fuels.

Shipyards, unlike production-line manufacturing facilities, produce a variety of wastes that can have considerable diversity in their characteristics. A waste that was non-hazardous one day could be a hazardous waste the next, depending upon the processes that generated the waste. It is important for all shipyard workers to understand the basics of waste management and to take the proper precautions to ensure the correct handling of the wastes which are generated by their job tasks. When in doubt, always ask for guidance from your supervisor or qualified company personnel.

WASTE MINIMIZATION, REUSE, RECYCLING AND RECLAMATION

NOTES:

OBJECTIVE

Promote waste minimization, recycling, reuse and reclamation in the shipyard.

WHY MINIMIZE WASTE AND RECYCLE MATERIALS?

Waste minimization and recycling are essential for preserving the environment and saving the shipyard money. Land fill capacity is being reduced as we generate more and more waste. Each year the shipyard spends thousands of dollars to dispose of hazardous waste and trash. Everyone can contribute to preserving both natural and financial resources by reusing, reclaiming, recycling and minimizing waste.

In addition to effectively managing the waste that is presently generated, The Shipyard has undertaken steps to actually reduce the quantity of waste that will be generated in the future. This concept is called "waste minimization" and is made up of several parts. These are:

Source Reduction

Decreasing the amount of waste generated by modifying or redesigning the process (e.g. primer line).

Recycling

Processing a material to regain its original use or other beneficial purpose (e.g. paper and paint).

Reuse

The process of using a material more than once. For example, many sand blasting and grit blasting machine reuse the material 10 to 1000 times.

Material Substitution

Seeking alternative chemicals or processes which reduce or eliminate the generation of waste (e.g. non-solvent cleaners).

Incineration and Treatment

Destroying, detoxifying, or neutralizing a waste to form a non-hazardous substance (e.g. paint sludge).

You have probably already seen some of the effects of the waste minimization and recycling plan in the shipyard.

WASTE MINIMIZATION, REUSE, RECYCLING AND RECLAMATION (Cont.)

Waste minimization, reuse, reclamation and recycling are all forms of pollution prevention, and cost reduction. When life cycle costs of job tasks include waste disposal, these pollution prevention strategies are often very cost effective.

APPLYING WASTE MINIMIZATION TO YOUR AREA

- Understand what kinds of waste are generated from your work tasks.
- Think about what you can do to reduce each type of waste.
- Consider each step in the waste stream generation process to look for changes that can reduce the volume or hazards of the waste.
- Recover and reclaim materials "in line" whenever practical. Reuse waste materials in the same job task if the materials still meet specification. If practical, reuse waste materials in other job tasks.
- Never purchase more than you need for specific tasks or jobs. Rotate stock so that the self-life of the material does not expire before use. Recommend to your suppliers that they adopt just-in-time material delivery whenever possible.
- Segregate waste streams to prevent the co-mingling of hazardous waste and trash, thereby decreasing the volume of hazardous waste. For maximum efficiency, waste streams should be segregated at the point of generation, prior to transportation to other areas of the shipyards for disposal, reuse or reclamation.
- Calculate the cost of waste disposal into each job task. Some tasks may not be profitable if the waste disposal costs are too high.

NOTES:

OBJECTIVE

To increase awareness and help to ensure that shipyard workers follow GEPs in their areas.

INSTITUTE PERFORMANCE EVALUATIONS:

The process of GEP performance evaluation is crucial to the success of any environmental compliance program. Evaluation is the process of periodic potentially unannounced internal inspections to ensure that individuals and departments are taking proper measures consistent with Good Environmental Practices. This internal evaluation is an excellent tool that companies can use to measure the overall performance of pollution prevention and shipyard environmental compliance. The intent is to provide an objective point of view about how well the shipyard is performing before potential violations and/or unnecessary releases occur. The evaluations are meant to complement all self-inspection and preventive maintenance programs currently in place. All GEP evaluations should be reviewed with and provided to the responsible department personnel for evaluation and improvements.

INSPECTIONS AND RECORDKEEPING:

Use evaluation forms that contain date, time, results of inspection, and proposed follow-up. A follow-up procedure should be in instituted to ensure that adequate response and corrective actions are taken. (See Performance Evaluation Checklist Form)

Evaluations should include an examination of pipes/pumps, containers (open lids), tanks, leaks/seepage, material and wastes transfer processes, storage areas, housekeeping issues, baghouses, ducting systems, containment curtains, procedural compliance, and other potential release points identified.

INSPECTIONS AND PERFORMANCE EVALUATION

NOTES:

INSPECTIONS AND PERFORMANCE EVALUATION (Cont.)

Assess areas identified for performance evaluation are selected on the basis of potential for accidents and risk of releases. Evaluate performance at potentially high risk areas and practices such as:

- Hazardous materials and waste storage areas
- Transfer areas and operations
- Loading and unloading of materials and waste
- Containment screening
- Proper housekeeping practices

Identify optimal time intervals between evaluations. It is sometimes desirable to include environmental concerns into an existing inspection program.

Individuals performing the evaluations and inspections should have proper training, education, and experience in environmental management and company-specific operations.

NOTES:

PURCHASING HAZARDOUS MATERIALS

NOTES:

OBJECTIVE

To introduce prudent purchase practices to reduce costs and environmental liabilities.

Chemicals are an essential part of our lives at home and at work. Generally, a hazardous material is any chemical that has the potential for producing harm to human health or the environment. Mishandling or misusing of these chemicals can cause injuries and environmental damages. Proper identification of hazardous materials and the knowledge about them can and will prevent injuries or damages to the environment.

One important task that a hazardous materials coordinator faces is making hazardous material purchases. By practicing prudent buying habits, you can prevent many environmental liabilities and significantly reduce costs associated with hazardous materials and wastes.

GOOD ENVIRONMENTAL PRACTICES

PRE-PURCHASE REVIEW

- Check with your environmental or safety department for strictly regulated hazardous materials before ordering. Many shipyards have put great efforts to reduce or eliminate the use of many regulated materials such as ozone depleting substances (e.g., CFC-113, 1,1,1 trichloroethane), xylene containing solvents, and lead based paints.

DO NOT OVERSTOCK

- Avoid ordering hazardous materials more than needed. Any cost savings realized by ordering bulk quantities can be wiped out by one spill incident and clean up effort. A large inventory of hazardous materials may increase the local permit fees. Also, expired material may have to be managed as hazardous wastes which is costly and increases the company liability.

- Adopt a Just-In-time (JIT) type of approach to inventory control.

- Exchange or return hazardous materials before the shelf-life expires.

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