

BIW is committed to protect the environment and provide a safe and healthy workplace.

- **Recognize and prevent** workplace hazards and pollution
- **Involve our employees** and community to create a safe workplace and protect the environment
- **Comply** with all Environmental, Health & Safety laws and regulations, and other commitments; and
- Periodically review and set objective for **continuously improving** our processes to reduce illness, injuries, and prevent pollution

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PREFACE

This handbook is general in nature and is not meant to be all-inclusive. It may not have the most current information available. Employees are responsible to review other relevant documents. These documents take precedence. BIW has many other rules, work practices, and directives such as Environmental, Health and Safety Procedures (EHSPs and SPMs) , Work Instructions (WIs) Departmental Operating Instructions (DOIs), and other methods of controlling the hazards inherent in shipbuilding. These procedures are available on the BIW Intranet. If you do not have Intranet access, please contact your supervisor for copies of procedures.

Rules and regulations in this handbook shall apply to all BIW employees, and all subcontractors, visitors, SUPSHIP personnel, military personnel, or others on BIW property.

Supervisors are responsible for safety and environmental compliance in their areas, as well as for the safe work practices and safe behavior of any employee. Each employee is responsible to work in a safe and environmentally compliant manner, by following all environmental, health and safety rules and regulations as a condition of employment. Particular care shall be given to assuring that tools and equipment are in safe condition and that the proper tools for each job are used. The company

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considers it the employee's responsibility to resolve or report unsafe or noncompliant conditions to supervision.

Nothing in this safety handbook shall violate the Union contract, State, or Federal law. Any questions regarding this handbook or interpretations of rules in this handbook should be addressed to Environmental, Health and Safety, (EHS), x1635.

ENVIRONMENTAL, HEALTH & SAFETY EXPECTATIONS

As an employee of BIW, you are expected to work safely at all times and in a manner that is protective of the environment. You can expect that all levels of management at BIW are sincerely concerned with your safety and are striving to provide you with the safest possible working conditions. In addition, you can expect that all levels of management are committed to the protection of public health and the environment.

Management at all levels has responsibility for assuring that every activity is performed under safe and environmentally compliant conditions. Every member of management is required to continually consider the safety of all subordinates and enforce established safety procedures.

Our mutual expectations can be met by working together in following some basic rules.

- If a mechanic or a supervisor is unsure of the safety requirements or guidelines relating to the task being performed, it is their responsibility to research those issues prior to starting the job. Supervision will ensure all safety requirements are in place before continuing.

- Follow approved procedures.
- Wear all required personal protective equipment (PPE), i.e., safety glasses, ear protection, hard hat, ANSI approved footwear, gloves, respirators etc.
- Stay alert for possible hazards around you and your fellow workers.
- Be responsible for your work area by maintaining good housekeeping practices at all times. Poor housekeeping, such as lines, leads, and ventilation tubes left on the floor, contributes to slips, trips and falls.
- Only operate equipment that you've been properly trained for and are authorized to use.
- Learn to recognize hazards and correct them immediately if you are qualified. Those you cannot correct should be reported to management or a Safety Inspector. You may need to involve your Union Safety Committee if there is no response (LS6 –x2063, LS7-x3787, BMDA x2216, and IGA x2266). If the hazard still exists call Safety and Health Engineering, x4777 (this number is not intended for emergency and imminent danger situations).

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- In the event of a serious accident or incident as described in SPM-S-03, the supervisor shall notify the Safety Engineer in his/her area and line management. If it is after working hours, page the on-call Safety Engineer @ 443-0376.
- If your work affects others, be sure to inform them of what you are doing and eliminate any possible hazards immediately.
- Always plan your work with safety in mind.
- Be familiar with materials you are working with and know the hazards that can be associated with them. (i.e., hazard communication training). See SPM-IH-05 for more detail (available on the BIW Intranet).
- If ever in doubt as to your safety or anyone's safety, consult a supervisor or your Safety Inspector immediately.
- Take appropriate precautions to prevent spills.
- Clean-up spilled material immediately;
- Place waste in proper containers;
- Report spills immediately by calling x2222 at Bath or x1222 at Brunswick facilities;

- Use secondary containment when storing liquids such as chemicals, oils or paints;
- Maintain good housekeeping to prevent material from being washed down storm drains and into the river.

1.0 GENERAL REQUIREMENTS

- 1.1 In order to minimize risk of injury when entering or exiting the shipyard during your working hours, employees will use designated walkways to get to and from their assigned workplace.
- 1.2 Avoid shortcuts through high-risk areas.
- 1.3 All signs and barriers must be observed at all times. Signs or barriers posted for limited duration shall be dated and removed at the completion of the job by the trade directing that activity. See SPM-S-11 for more detail.
- 1.4 Running, horseplay, and practical jokes are strictly forbidden.
- 1.5 No employee shall at any time remove or make inoperative any safety device.
- 1.6 No one is authorized to operate any equipment without prior instruction or training from a qualified trainer.
- 1.7 Temporary or permanent safety lines and railings shall not be cut, altered, or removed for any reason by employees who have not been properly trained and qualified.

- 1.8 Leads, lines, hoses and vent tubes are to be hung up off of the walking surfaces by personnel installing or using them. Similarly, they are to be removed from the work site when no longer in use. Care shall be taken to ensure that these materials do not block walking and working surfaces.
- 1.9 Cables and stanchions may be used as fall protection on elevated edges, open holes, and around other hazards. Leads, lines, hoses, and ventilation tubes must not be hung from the cable.
- 1.10 Fall protection is required in areas that are five feet above another surface or when impalement hazards exist that cannot be protected. No work is to be performed until adequate protection is provided. See 2.9 Fall Protection for more detail.
- 1.11 When working in or on the overhead, or from upper levels, do not drop or throw anything to lower levels.
- 1.12 Scaffolding or staging structures, such as ladders, shall not be used as a support to lift or lower material.
- 1.13 Employees are to remain alert to the various warning horns, whistles, and bells throughout

the yard. These warning sounds must be heeded and appropriately acted upon, such as moving away from overhead loads, keeping clear of tracks during crane movement, or staying clear of emergency vehicles. Lighting is provided on many different vehicles and equipment to aid hearing impaired employees.

- 1.14 Always use the appropriate device to raise yourself up to conduct work such as a ladder, sawhorse, staging, or aerial lift.
- 1.15 Walkways, aisles, roadways, access and exit areas shall be kept clear of material and equipment at all times.
- 1.16 Handrails are to be used when ascending or descending stairways.
- 1.17 Warning signs shall be posted alerting employees of the hazard when deck plates are removed or unsecured. Consult SPM-S-11 for guidance.
- 1.18 Budda jacks, mag-base drills, and magnet lights must be secured with cable to eliminate the hazard of the device falling from a height.
- 1.19 Electrical drop lights are provided with cages to protect personnel and the bulb. If the cage or

bulb is damaged or missing remove the drop light from service immediately.

- 1.20 Protruding nails or spikes are to be pulled out of or hammered into the material.
- 1.21 Items such as stuffing tubes, light hangers, studs, pins, etc. must be covered or identified by other means to protect against trips or potential impalements.
- 1.22 Ensure the ground pins on equipment or power cords, droplights, etc., are present and in good condition.
- 1.23 Ground Fault Current Interrupter (GFCI) is required to be used with electrical equipment or tools used in wet locations to avoid potential shock injuries. GFCI is sometimes provided from the outlet or from a GFCI extension cord, available at the Tool Crib.
- 1.24 All appliances must be UL listed and have proper grounded plugs. Appliances include but are not limited to: toaster ovens, refrigerators, microwaves, radios, coffeepots, hot plates, etc.

2.0 PERSONAL PROTECTIVE EQUIPMENT

Proper engineering and administrative controls shall be implemented in order to reduce employee exposure to work-related hazards. Personal Protective Equipment (PPE) is the next step in reducing employee exposure. When used properly, the controls, combined with PPE, will provide a safe and healthy working environment.

In order to ensure the maximum level of protection, personal protective equipment shall be worn in a manner consistent with the manufacturer's design criteria.

Personal Protective Equipment shall be worn in all production areas or when otherwise indicated. All PPE requires EHS approval.

For more information, see SPM-S-05.

2.1 Head Protection

Employees and contractors shall wear hard hats at all times while in designated areas of BIW property. Unless otherwise indicated, designated areas include:

- Aboard ship
- Aboard any floating equipment

- Staging
- Docks and LLTF
- Outside assembly platens
- 5-Skids
- Outside work and storage areas
- Assembly Building
- Panel Line
- Shell Shop
- Hyde South
- Preoutfit II Building
- Hardings
- All areas where there is overhead work or where cranes pass overhead
- There may be circumstances where chin straps and light activated welding hoods are required to enhance and support compliance with the head protection policy.
- Hard hats shall be worn in conjunction with welding hoods in areas where hard hats are required.
- **Hard hats shall be worn while working in the overhead.** It is permissible to remove a hard hat when and only when the hat itself does not fit in the area where your head is located.
- **All rigging operations require hard hat protection regardless of work area.**

Processes/Areas that allow exclusion to this requirement include:

NOTE: These exclusions only apply when there is no danger from overhead hazards.

Processes

- Working on computer systems in completed ALO spaces where construction work has ceased
- Spray painting operations
- Events, ceremonies, trials, etc. where construction work has been ceased
- Flat panels on panel line (in accordance with Memorandum from Dan Nadeau to Mark Lamarre dated 08/15/05)
- Boiler operation

Areas

- Nomex, pipe, tin, D/09 service shops
- South electric shop
- Hyde south basement
- North electric shop
- Administrative office spaces
- Boiler room
- Carpenter shop
- EBMF (inside building only)
- Hardings (C-bay, small assembly, door shop – work stations only, blast & paint, powder paint, shape layout)
- Machine shop

- Maintenance shops, AWP, pipe coverers, Maintenance garage
- Building 18
- Reduction gear
- Label plate

2.2 Eye Protection

During working hours, ANSI-approved safety glasses with side shields or safety goggles shall be worn at all times in all areas of BIW property, excluding administrative office spaces..

ANSI Z87.1 glasses are required in the shipyard. Should you damage or crack your prescription safety glasses while at work, your prescription glasses will be replaced at the BIW Main Store or Hardings Main Office upon presentation of the damaged or cracked glasses.

No dark or shaded lenses with a shade grade greater than 1.5 shall be worn in buildings, units or ships, or after sunset. Shaded lenses are permitted for operations or working in close proximity to operations that produce bright light, such as welding, burning etc. These glasses must be removed and replaced with clear lenses when the operation has ended or when the employee is moving through buildings, units or ships, or outside after sunset.

In addition to the above requirements, the following charts shall be used as a guideline for double eye protection and shaded lens protection while engaged in certain operations.

OPERATIONS REQUIRING DOUBLE EYE AND FACE PROTECTION

OPERATION	PROTECTIVE EQUIPMENT	COMMENTS
Boring Drilling Filing Punch Press Reaming Sealing Scraping Sawing (wood)	Safety glasses with side shields or monogoggles, or cup goggles	Face shield required for overhead work
Blowing down Chipping Disc Sanding Grinding (Stone&Offset) Needle gunning Wire brushing Sawing (metal)	Safety Glasses with side shields or monogoggles, plus a face shield	Monogoggles with face shield recommended for overhead work
Furnace Operations	Safety glasses or cup goggles with a face shield as necessary	
Chemical handling	Safety glasses with side shields and face shield required when handling corrosives	

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GUIDE FOR SHADE NUMBERS

Process	Electrode Size (inches)	Arc Current (Amperes)	Minimum Protective Shade	Suggested* Shade No. (Comfort)
SMAW	Less than 3/32	Less than 60	7	--
	3/32-5/32	60-160	8	10
	5/32-1/4	160-250	10	12
	More than 1/4	250-550	11	14
GMAW and FCAW		Less than 60	7	--
		60-160	10	11
		160-250	10	12
		250-550	10	14
GTAW		Less than 50	8	10
		50-150	8	12
		150-500	10	14
CAC-A Gouging	light	Less than 500	10	12
	heavy	500-1000	11	14
PAW		Less than 20	6	6 to 8
		20-100	8	10
		100-400	10	12
		400-800	11	14
PAC		Less than 20	4	4
		20-40	5	5
		40-60	6	6
		60-80	8	8
		80-300	8	9
		300-400	9	12
	400-800	10	14	
TB		--	--	3 or 4
TS		--	--	2
CAW		--	--	14

Processes:

SMAW	Shielded Metal Arc Welding
GMAW	Gas Metal Arc Welding
FCAW	Flux Cored Arc Welding
GTAW	Gas Tungsten Arc Welding
CAC-A	Air Carbon Arc Cutting (Gouging)
PAW	Plasma Arc Welding
PAC	Plasma Arc Cutting
TB	Torch Brazing
TS	Torch Soldering
CAW	Carbon Arc Welding
OFW	Oxy-Fuel Gas Welding
OC	Oxygen Cutting

GUIDE FOR SHADE NUMBERS

Process	Plate Thickness (inches)			Suggested* Shade No. (Comfort)
OFW				
light	Under 1/8			4 or 5
medium	1/8 to 1/2			5 or 6
heavy	Over 1/2			6 or 8
OC				
light	Under 1			3 or 4
medium	1 to 6			4 or 5
heavy	Over 6			5 or 6

* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxy fuel gas welding, cutting or brazing where the torch and/or the flux produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line of the visible light spectrum.

2.3 Foot Protection

Bath Iron Works Corporation requires ANSI Z41-1991-approved safety footwear in all facilities for all individuals assigned to work in the following areas: aboard ships); aboard any floating equipment; on LLTF, staging, docks, dry-docks and all outside work and storage areas; Assembly Building, Panel Shop and all industrial shops; all warehousing and material storage areas; Paint and Blast Buildings. The American National Standards Institute (ANSI) requires a protective toe cap of steel, composite, or fiberglass.

It is recommended that ANSI footwear be all leather. No fabric or partial fabric ANSI shoes or boots should be worn while conducting hot work. In this application hot work is defined as tack welding, welding, and burning operations. These operations may potentially cause fabric to melt or burn.

The exceptions to wearing ANSI approved footwear are as follows:

- Employees traveling to their manufacturing work site at the start of or leaving at the end of their shift
- Employees reporting to work after the start of the regular shift or leaving early

- Portal and bridge crane operators as long as they remain on designated walkways traveling to and from their crane.
- Employees working in non-manufacturing areas or traveling through manufacturing areas to access MSC or the Craft Administration Office traveling on designated exterior walkways
- Non-employees on business related facility tours accompanied by authorized BIW personnel

ANSI-approved footwear is available for employee purchase at the BIW Employee Store.

2.4 Hand Protection

Suitable and appropriate gloves shall be required for specific job functions. These will be so indicated by a Classification Administrator or Foreman of the trade, i.e., for cleaning and material handling operations. Classification Administrators, with guidance from the EHS division and Medical representatives, are responsible to develop criteria, by task, for the use and type of gloves.

Gloves shall not be worn when operating rotating or reciprocating machinery.

SEE GLOVE CHART ON INSIDE BACK COVER

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Required Chemical Protective Glove Selection Chart (* = Recommended)

Hazardous Material Operation	Neo-prene Thick	Natural Rubber Thick	Nitrile Thick	Nitrile Thin	Vinyl Thin
Acid	<input type="checkbox"/>				
Bondo			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Roll Epoxy & Lo Flash *	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Caustic Chemical	<input type="checkbox"/>		<input type="checkbox"/>		
Chemical Paint Stripper		<input type="checkbox"/>			
Flame Retarding Dip Tank	<input type="checkbox"/>		<input type="checkbox"/>		
Fuel *	<input type="checkbox"/>		<input type="checkbox"/>		
Janitorial *		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paints-Other *	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paint Thinners *			<input type="checkbox"/>		
Solvent Washing	<input type="checkbox"/>		<input type="checkbox"/>		
Spray - Epoxy & Lo Flash	<input type="checkbox"/>		<input type="checkbox"/>		

Recommended Gloves for Manufacturing Processes

Operation	Cotton Gloves	Leather and Pigskin (lined/unlined) gloves	Blue Beast Welding gloves	Pigskin Welding gloves	Small Welding gloves	Robar gloves
Oxy/Fuel burning			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Grinding		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
Material Handling		<input type="checkbox"/>				
Brazing		<input type="checkbox"/>				
Gouging			<input type="checkbox"/>	<input type="checkbox"/>		
Plasma Cutting		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sandblasting						<input type="checkbox"/>
Shipfitting		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweeping	<input type="checkbox"/>					
Tacking		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Welding			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

2.5 Hearing Protection

Hearing protection shall be worn at all times in those areas so indicated as "hearing protection required" areas. This requirement applies to all persons passing through these areas, as well as to those working in the areas.

In addition, hearing protection shall be worn while working within fifty (50) unobstructed feet of any of the following operations: grinding, needle gunning, abrasive blasting, plasma arc cutting, deck scaling, chipping and powered sawing.

In any situation, if you must raise your voice to be understood by someone standing next to you, then the noise levels are high enough to require hearing protection.

Double hearing protection (ear plugs plus ear muffs) shall be worn by anyone engaged in chipping and or carbon arc gouging, as well as by anyone working within fifty (50) unobstructed feet of either operation. Ear plugs and ear muffs are available at all shipyard tool cribs.

I-Pod and Walkman-type devices that place ear pieces in or over the ear are not permitted to be worn in Production areas. These devices increase the potential for hearing related injuries and can interrupt

needed communications, such as alarms or announcements.

For more information, see SPM-IH-13.

Bath

<u>Area:</u>	<u>Single Hearing Protection Required:</u>
Aluminum Shop	Full time
Assembly Building	Full time
Blast Buildings	During operation
Boiler and Compressor Rooms	During operation
Carpenter Shop	During operation
Pipe Shop	During operation
PreOutfit 2	Full time
Tin/Nomex Service Shop	During operation

“During Operation” = equipment or tools, such as listed below, but not limited to, are in operation in the area.

Hardings

<u>Area:</u>	<u>Single Hearing Protection Required:</u>
Blast and Paint Conveyor Building	During operation
Door Shop	Full time
Fabrication Buildings and Annex	Full time
Plate Shop and Plate Preparation	Full time

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East Brunswick Manufacturing Facility

Area: _____ **Single Hearing Protection Required:**

Pipe/Sheet Metal Fabrication Full time

Operation: _____ **Hearing Protection Required:**

Grinding	Single
Abrasive blasting	Single
Buffing	Single
Wire wheel brushing	Single
Cut-off wheel	Single
Arc gouging	Double
Bobcat	Single
Deck scaling	Double
Turbine operation	Single
Flame straightening	Single
Forklift	Single
Hammering	Single
Kett saw	Double
Needle gunning	Single
Pneumatic, Electric, Gas Sawing	Single
Pneumatic chipping of metal	Double
Pneumatic chipping on decking	Single
Routering	Single
Sonar operation	Single
Sponge blasting	Double *
Pressure Water Cleaning	Single
Pressure Water Jetting	Double

Single=Ear plugs or ear muffs

Double=Ear plugs and ear muffs

* Limited to 90 minutes of "trigger time" exposure per day

2.6 Respiratory Protection

The wearing of respiratory protection may be required when performing certain operations or when working in environments which contain airborne concentrations of toxic or hazardous substances. If your job assignment requires a respirator, you will be informed of that requirement by your supervisor.

Prior to being assigned a respirator, you must be fit-tested and trained to use the device; you must also be evaluated to determine if you are physically qualified to wear a respirator.

Upon completion of these prerequisites, you will be issued a respirator certification card. No employee shall be issued a respirator without presenting a valid certification card and or badge.

In order to provide maximum protection, the sealing surface of a respirator facepiece must be firmly sealed against the wearer's face. Full-face and half-face tight-fitting respirators shall not be worn by any employees having facial hair. Employees who are given a work assignment that requires a respirator are expected to be clean shaven, meaning that facial hair is prohibited.

- Examples of facial air include, but are not limited to, beards, goatees, stubble (i.e., defined per

OSHA guidelines as facial hair that exceeds one day's growth), long sideburns, and low hairlines.

- A Soul Patch, a small strip of facial hair centrally located between the lower lip and the upper chin, is acceptable except where it comes in contact with any part of the respirator.
- Mustaches which do not extend below the corners of the mouth AND which do not interfere with respirator valve function are acceptable.

Respirators must be returned to the point of issue at different time frames. Ensure that you are aware of the correct time frame to return your respirator.

Using your certification card to obtain a respirator for another employee, as well as using another employee's certification card to obtain a respirator for yourself is strictly prohibited.

Employees must comply with the "Respirator/Ventilation Requirements" chart in SPM-IH-03 for the various shipyard tasks.

For more information, see SPM-IH-03.

2.7 Protective Clothing

- Shirts shall be worn at all times. Shirts must have a minimum of 1/4 length sleeve. When welding, torch cutting, brazing, and doing other processes which produce hot sparks, full-length sleeves shall be worn. Employees shall not wear clothing made of synthetic material when engaged in these operations. Cotton is recommended. For overhead work, leather sleeves, capes or jackets are required.

It is recommended that all Production employees avoid wearing clothing of synthetic materials on the work site since such clothing is especially susceptible to sparks and could cause severe body burns. Loose or flopping clothing is prohibited. Frayed clothing is prohibited when working or near hot work operations. Full leg and torso covering is required at all times in all industrial and storage areas.

Visitors on tour through any production area shall be required to adhere to the BIW Standards regarding protective clothing. The one exception to this rule will allow female visitors to wear a dress while on tour, with the understanding they proceed through production areas in a timely manner and remain in the walkways at all times. No high heels, open toed shoes, or exposed feet are allowed.

2.8 Personal Care

When the length of hair presents a hazard, it must be restrained in such a way that it does not expose the employee to the hazard.

All items of jewelry are discouraged in production areas. Jewelry has an ability to conduct electricity, become tangled in machinery or equipment, or be caught during movement, all of which can lead to an injury. Remember, the jewelry you wear must not compromise your safety.

Employees are strongly encouraged to wash prior to eating. Eating or drinking in areas undergoing surface preparation or preservation is prohibited.

2.9 Fall Protection

Fall protection is required when above five feet. The most commonly seen fall protection at BIW is the use of cable and stanchions (C&S) to separate an employee from an edge or open hole. Employees are not permitted to cross through C&S fall protection unless they are adequately protected from the fall hazard and authorized to do so.

Other methods of fall protection are **fall restraint** and **fall arrest**. Restraint systems are designed to support the employee by preventing a fall. Restraint comes in many forms: it may be a tag line set six feet back from an edge or opening, retractable lanyards, or an anchor point on a unit or deck that is designed to keep you away from the edge or opening. All are designed to prevent a fall. **Arrest** systems are designed to support the employee should a fall occur. This system requires more thought and planning because the end result, if a mistake is made, will be a fall. A good arrest system will minimize the distance an employee could fall. Both **restraint** and **arrest** systems require a safety harness to be worn and the lanyard hooked up.

When working over land or structure, each employee working from a "picture box", aerial lift, or suspended platform shall be secured by a safety harness and lanyard.

When working over water, from floating equipment, or when working 6 feet from unprotected pier edges, all employees shall wear life preservers. Body harness hook-up is not recommended when working over the water.

For more information on Fall Protection, see SPM-S-07.

3.0 WORK AREAS

3.1 Housekeeping

Good housekeeping is essential to safety and health. All employees are responsible for the housekeeping and orderliness of their industrial debris. Work in progress or material in storage must be kept out of walkways. Scrap material is to be placed in proper disposal containers by the employees creating the scrap, prior to leaving the job or prior to completing the shift.

As part of each employee's responsibilities, it is expected that each employee clean up their own industrial debris while performing their job functions. Additionally, as a precaution to protect yourself as well as others in the area against airborne particles, it is expected that each employee look over the work site prior to starting a job before activating an air tool.

Temporary or permanent electrical cords, welding leads, and/or air hoses shall not be extended across roadways, aisles and walkways, or arranged in any manner so as to create a tripping hazard, or where there is a risk that the insulation could be worn away or damaged. Hoses and electrical conductors shall be elevated over or placed under the walkway or

working surface or covered by adequate crossover planking.

3.2 Ventilation

The proper use of exhaust ventilation is extremely important during any operation which produces air contaminants (e.g., welding, oxy-fuel and plasma burning, brazing, carbon-arc gouging, grinding, and painting). Temporary exhaust ventilation must be positioned as close to the source of emissions as possible, in order to capture and remove contaminants from the work area. This practice accomplishes two objectives: first, the air contaminants are carried away before you have a chance to inhale them; and second, the air quality in the work area stays cleaner and healthier. Refer to the EHS Procedure Manual, SPM-IH-03, for the “BIW Respirator and Ventilation Selection Policy”.

3.3 Temporary Ladders and Ramps

Access and egress to and from ships, barges, and units or between any two vessels shall be provided by trained and qualified personnel. When ramps are provided for access they shall be accompanied by the proper netting. Ladders or ramps shall be of adequate strength, well maintained and properly

secured. Jumping on or off ships, barges or units is prohibited. When it is impracticable to install a ramp or walkway, a substantial straight ladder, extending at least 36 inches above the upper landing surface shall be used. In all cases it must be adequately "footed" or secured with non-combustible material against shifting or slippage. Ladders with bent or splintered side rails, or broken or missing treads, rungs, or cleats shall be removed from service immediately unless rungs are removed to provide access.

Electric arc welding operations shall not be performed from metal ladders or metal stools to prevent the potential fall hazard from an electric shock.

Scaffolding is also installed and maintained by trained and qualified employees and must be kept in a safe and secure condition. Any defective components shall be replaced immediately by the appropriate employee. Back rails and toeboards shall meet or exceed the minimum requirements. Toeboards no less than 1" by 4" are required on working surfaces to prevent tools and material from falling on people below. $\frac{3}{4}$ " x 6" (or greater) plywood is acceptable to use as a substitute. Backrails shall be positioned with a top rail with an upper surface between 42" to 45" above the upper surface of the staging platform or runway and a midrail located

halfway between the upper rail and the staging platform or runway.

It is the responsibility of all employees to keep scaffolding clear of industrial debris or equipment. Do not work off scaffolding that is ice or snow covered.

3.4 Heaters/Fans

Only Company-provided heaters or fans will be permitted on BIW property. Only trained and qualified employees are responsible for the proper installation of these items. Fans and heaters shall be located in such a way that clothing or hair cannot be drawn into them. Guarding must be in place to protect against accidental contact with rotating parts. Missing guards or guard openings in excess of 1/2 inch must be removed from service until repaired.

4.0 POWERED VEHICLES

- 4.1 Motor vehicle traffic and crane movement are restricted during the following time periods (exceptions require approval from Safety Operations):

MAIN YARD

6:45 a.m. - 7:05 a.m.
11:30 a.m. - 11:40 a.m.
11:55 a.m. - 12:00 p.m.
3:25 p.m. - 3:35 p.m.
3:45 p.m. - 4:00 p.m.

11:25 p.m. - 11:50 p.m.

NORTH GATE

12:00 p.m. - 12:10 p.m.
12:25 p.m. - 12:30 p.m.

HARDINGS

6:20 a.m. - 6:35 a.m.
11:30 a.m. - 11:40 a.m.
11:55 a.m. - 12:00 p.m.
2:55 p.m. - 3:05 p.m.

EBMF

6:13 a.m. - 6:23 a.m.
11:30 a.m. - 11:40 a.m.
11:55 a.m. - 12:00 p.m.
2:43 p.m. - 2:53 p.m.
3:25 p.m. - 3:30 p.m.

- 4.2 All vehicles are limited to 10 mph or less inside yards.
- 4.3 Seat belts shall be worn by all occupants in all company vehicles at all times while in operation outside the yard and in private vehicles by employees while traveling on company business. Occupants of vehicles operating within the facilities are urged to use them.

- 4.4 Vehicles that have restricted visibility are required to have an audible back-up alarm. They shall not be operated if the alarm is not functioning. Temporary alarms may be used. They are located with Security at the plant entrance gates. If these temporary alarms are not available or effective with a particular vehicle type, a spotter may be utilized to facilitate movement. If the described methods are inadequate to allow a vehicle to move safely, then Safety and Health Operations must be contacted to assist in the development of a safe move plan.
- 4.5 The driver of the vehicle is responsible for the safe loading and operation of the vehicle. The driver shall ensure that visible warning devices (e.g. flags) are attached to material which extends beyond the borders of the vehicle at the time the vehicle is loaded to alert pedestrians moving around the vehicle and other vehicle operators to the hazard.
- 4.6 All mechanical maintenance shall be performed by a qualified mechanic. When required, the vehicle's checklist is to be completed by the driver on each shift
- 4.7 The driver shall ensure that oversized loads have been properly permitted before hauling

over the road, and that any required escorts accompany the vehicle.

- 4.8 Only trained and authorized operators shall operate aerial lifts or personnel-lifts. Safety harnesses and lanyards shall be worn and secured at all times except when working over water. When working over water, approved personal flotation devices shall be worn.
- 4.9 Operators shall not park vehicles in walkways or leave an unattended vehicle obstructing any roadway. Do not block roadways that may restrict emergency vehicle passage.
- 4.10 **Overhead Cranes, Gantry Cranes, and Mechanical Lifting Devices:**
Only designated personnel who are trained and qualified shall operate a crane or mechanical lifting device. Operators shall not pass loads over the heads of other employees. Employees are required to move away from overhead loads. For more information, the video library has a film on overhead loads (#161).

The operator of cranes and mechanical lifting devices must give audible warning when a

load is to pass over an area where any people are located. The operator must not knowingly move loads over personnel.

The rated lifting capacity of any lifting device shall be posted on the equipment and not be exceeded unless an approved engineered lift is planned with Engineering, Facilities Crane Engineers and Safety Engineering.

Where mechanical lifting devices are used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passing through is required

4.11 **Forklift Operations:**

Only trained and certified operators shall operate a forklift.

Seat belts are required to be worn when operating a forklift.

No person shall be allowed to stand or pass under the elevated portion of any truck whether loaded or empty. When a forklift is left unattended and out of sight, or 25 feet from the operator, the following precautions shall be implemented:

- a) Load engaging means shall be fully lowered.
- b) Controls shall be neutralized.
- c) Power shall be shut off.
- d) Brakes set.
- e) Wheels shall be blocked if the truck is parked on an incline.

Only approved forklifts shall be used in hazardous locations (i.e., blast/paint buildings).

If at any time a forklift develops a mechanical or electrical problem which would impair the safe operation of the forklift, it shall be taken out of service until such time as it is restored to a safe operating condition.

All forklifts shall be inspected by the operator on each shift prior to being placed into service. Any defects found shall be immediately reported to the operator's supervisor.

To avoid lifts shifting on grades, operators shall drive the load up-grade.

4.12 **Traveling:**

All traffic regulations shall be observed, including authorized plant speed limits of 10 mph, unless otherwise posted.

The right of way shall be yielded to pedestrians, ambulances, fire trucks, and other vehicles in emergency situations.

The driver shall slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.

Grades shall be ascended or descended slowly.

The driver shall slow down for wet and slippery surfaces.

5.0 HAZARDOUS MATERIALS / SUBSTANCES

5.1 Hazardous Materials

Many hazardous materials can be used safely provided that the appropriate precautions are taken. Information is available to employees in the form of **Material Safety Data Sheets** (MSDSs), container labels, and training.

All hazardous materials used by BIW have MSDSs available for employee review. The MSDSs offer employees the means of becoming familiar with hazardous substances before working with them. MSDSs provide recommended practices and information in the areas of personal protective equipment, health hazards, hazardous chemical contents, proper work practices, emergency procedures, and other precautions. MSDSs are kept on file with Environmental Operations, and many are available on the Intranet. Paper copies can be obtained by calling x5555.

Basic **Hazard Communication** (HazCom) training at new employee orientation includes “Right to Know” information and lessons on categories of hazardous materials at BIW. Supervisors are responsible for providing detailed HazCom training in the form of an annual safety talk. No hazardous material shall be

used by anyone who has not received HazCom training. Employees must store material in accordance with MSDS guidelines.

Proper labeling of hazardous materials is a key part of a hazard communication program and certain information must be present on hazardous material containers. Secondary containers shall be labeled with the product identify and health hazard warnings. In addition to these requirements, containers are labeled with MSDS numbers to help direct employees to proper MSDSs. See SPM-IH-05 or Safety Talk #168 for more information.

5.2 Compressed Air

Direct yard air pressure is maintained between 90 and 100 psi, and is to be used at that pressure for pneumatic tools only, or for an authorized process such as gouging or air pressure testing. Yard air, when used to blow down equipment, clean floors, or dry off wet or painted surfaces, shall require a special nozzle which will reduce air pressure to 30 psi when the nozzle comes in contact with any surface. Eye and face protection is required when blowing down. See Section 2.2 of this handbook.

Never point a jet of compressed air at another person or use it to clean clothing, as it can penetrate the skin and cause a severe injury.

5.3 Compressed Gases

Compressed gases are widely used throughout the shipyard for welding, cutting and brazing, as well as heating spaces, testing tanks, powering vehicles, and as fire-extinguishing agents.

Compressed gases, by their nature, present various potential hazards, including fire, explosion, and asphyxiation when working in confined and enclosed spaces. Necessary precautions shall be taken to avoid the formation of a flammable or explosive atmosphere or an atmosphere deficient of oxygen through following the established guidelines. See SPM-S-39 for further guidance.

Compressed gases commonly used in the shipyard include, but are not limited to:

FLAMMABLE	NON-COMBUSTIBLE
<ul style="list-style-type: none"> • Burning/brazing gases (Mapp, Propylene, Acetylene) • LNG (Liquefied Natural Gas) • Propane (LPG) 	<ul style="list-style-type: none"> • Carbon Dioxide (CO₂) • Nitrogen (N₂) • Argon (Ar) • Carbon Dioxide / Nitrogen mixtures • Argon / Carbon Dioxide mixtures • Helium • Helium/Argon mixtures • Oxygen*

Hands and gloves shall be free of grease and oil when handling oxygen regulators.

Use only regulators indicated for use with oxygen.

Never use oil, grease, or other organic petroleum lubricant to lubricate oxygen regulators, valves, or fittings.

*Note: Special precautions must be taken when handling oxygen. Elevated concentrations of oxygen accelerate combustion to a point where ordinary combustibles will burn violently. The presence of

oxygen at elevated concentrations decreases ignition temperature and increases the flammability range, increasing combustion hazards.

Compressed gases are distributed in two ways in the yard:

1. Portable cylinders
2. Pipe-fed to various work stations from bulk storage sites

Cylinders:

All cylinders shall be legibly marked as to their contents and the flammable, combustible, or oxidizing characteristics.

All compressed gas cylinders shall be chained or wired upright to prevent them from falling and rupturing the cylinder or valve stem.

Acetylene cylinders shall not be stored or moved in a horizontal position, nor be opened more than half turn.

Cylinders must have their safety caps secured in place, with valves shut off, when not in use or while being moved or handled.

When transporting cylinders, ensure that they are secured and that tailgates are in the upright position.

- All cylinders shall be stored:
 - upright on flat surfaces
 - in a well-ventilated area away from heat sources.
- In addition, oxygen and fuel gas cylinders shall not be stored within 20 feet of combustible materials, and never in a confined space.
 - A 5-foot non-combustible, vertical barrier with a minimum ½ hour fire rating separating them may be utilized in lieu of the 20 foot rule.
- Cylinders shall be lifted only in cradles or in approved slings, never by the cap or cover.

Piped (Manifold) Gases

Manifolds shall be placed in well-ventilated areas and never in confined spaces. All gas manifolds shall be stenciled and color-coded as follows to identify each gas used:

Green

Red

Blue

Blue

Blue

Oxygen

MAPP Gas (Propylene)

Argon

Argon/CO2 (95/5)

Argon/CO2 (75/25)

Nothing that could damage the manifold or valves or interfere with the quick closing of valves shall be

placed on or in the immediate vicinity of the manifold.

No oxy/fuel line shall be left unattended in a confined space – EVER. No oxy/fuel line shall be left unattended in an enclosed space for more than ten (10) minutes. If this time limit is to be exceeded, the

line is to be bled and coiled back to the manifold or cylinder valve.

All valves shall be shut off, regulators bled off, lines disconnected and coiled, and all safety caps threaded on at meal time, at the completion of the job, and at the close of the shift.

No inert gas line shall be left unattended for more than one hour. Employees using inert gas shall be trained on the applicable requirements of SPM-S-39. All inert gas lines shall be disconnected at the completion of the job and the end of the shift.

Damaged or leaking tools and lines shall be turned into the nearest tool crib. Oxy/fuel hoses are tagged with a due date code. Check the due date prior to hooking up the hose. Return the hose to the tool crib if it is outdated. Oxy fuel lines are checked on a six month basis.

Do not paint fittings, regulators, hoses, leaders, or torches. This contributes to deterioration of hoses and inhibits the inspection process.

In the event of a need to evacuate a building or ship area, all line valves and the main valves to the manifold shall be shut off in accordance with the evacuation plan for that area.

Only employees trained, authorized, and issued a BIW license for oxygen, acetylene, propane, and MAPP/Propylene gases shall be permitted to use oxy-fuel equipment. See SPM-S-39.

When an employee recognizes a flammable gas leak, the valve will be secured (if the source of gas is known). He/she will notify those in the immediate area who are performing hot work to cease the operation and to evacuate the space. . The employee will then notify supervision and/or the fireguard so announcements can be made over the intercom system. No one should re-enter the space. Supervision or the fireguard will call the facility's emergency number so an assessment of the area can be made. The Laboratory will determine if entry and/or hot work may proceed.

5.4 Paints and Solvents

Paints and solvents shall be transported and stored only in approved containers. Secondary containers shall be labeled with the product identify, MSDS number, and health hazard warnings.

All solvent/storage cabinets/flammable liquid lockers shall be grounded. There shall be no hot work within

10 feet of a solvent storage cabinet/flammable liquid locker.

Special care will be taken to ensure that no incompatible materials are stored in solvent storage cabinets/flammable liquid lockers. Incompatible materials include acids, oxiders, and corrosives.

Most paints and solvents are flammable. Care must be taken to avoid igniting the vapors created from paints and solvents.

Paints and solvents must be disposed of properly; see Section 12.0.

Depending on how paints and solvents are used, special PPE and ventilation requirements may be necessary. See SPM-IH-03.

5.5 Radiation

Ionizing Radiation

Ionizing radiation results from the decay of unstable radioactive materials known as radioisotopes.

Radioisotopes are used in Non-Destructive Testing (NDT) by licensed BIW personnel. The procedures used by the NDT personnel are strictly regulated by the Nuclear Regulatory Commission.

The following work practices shall be followed when using radioisotopes:

- a. While radioisotopes are in use, the affected areas shall be taped off and warning signs prominently displayed. Yellow/magenta radiation hazard tape and signs will be used to designate affected areas.
- b. All workers not directly involved in the testing operations involving radioisotopes are prohibited from entering the area.
- c. Workers engaged in the use of radioactive materials shall wear dosimeter badges.
- d. NDT work shall be done on off shifts whenever practical.

Non-Ionizing Radiation

Non-ionizing radiation includes electromagnetic radiation in the form of visible, infrared, ultraviolet light, and radio waves generated by radar antennas.

It is the non-ionizing radiation from radar antennas that is of concern in this section.

- a. The safety precautions outlined in SPM-S-20 "Safe Operation of Radiating and/or Rotating Shipboard Antennas" shall be observed when antenna rotation and/or radiation are planned.
- b. Temporary warning signs will be posted at all access routes to potentially hazardous areas prior to transmitting and/or rotating antennas. The signs are black and red and read " Danger Radio Frequency Radiation Hazard" "Do not proceed beyond this point- contact D/10 Combat Systems".
- c. Employees wearing Pacemakers must remain in areas away from radiating antennas to ensure personal safety.

Electric magnetic radiation interferes with pacemaker function, in particular, welding equipment and welding leads. If you are wearing a pacemaker, please consult with the BIW Medical professionals.

6.0 Ergonomics and Material Handling

6.1 Ergonomic Injury Risk

Awkward or static postures, excessive force, and task repetition are risk factors that may contribute to ergonomic injuries in the shipbuilding industry

Ergonomic controls include:

Engineering

Eliminate the risk by changing the work process, tooling, or work station layout.

Administrative

Reduce the risk through training, task rotation, and a stretching program

Protection

Minimize the risk by using Personal Protective Equipment (PPE)

Every job classification and shipyard process at BIW has been evaluated for ergonomic injury risk. For more information regarding your specific trade contact Chris Barbor at Ext. 2246.

Remember:

Ergonomic injuries may develop over time due to repeated exposure to awkward postures, excessive force, and repetitive tasks. You are an industrial athlete. Use appropriate stretches to condition and lengthen muscles between times of peak activity.

6.2 Manual Lifting

Do not lift loads beyond your physical capacity. Lifting capacity varies among individuals. Get help or use mechanical assistance as necessary. Items that you can easily lift under normal conditions may require a two-man lift in congested areas.

All personnel shall wear appropriate gloves when handling material. Refer to Section 2.4 for recommended glove selections.

Only properly trained personnel shall use electric pallet jacks, walkie stackies, or electric forklifts used for material handling.

Do not pull or tug on material that is “caught” or “hung-up”, as it may quickly release and cause an injury.

The following 7 steps are recommended when manually lifting material:

1. Face the load
2. Keep your chest high
3. Bend your knees
4. Keep your back straight and avoid twisting
5. Keep the load close to you
6. Establish firm footing and solid grasp; don't lift from a twisted or awkward position or move to a twisted or awkward position with the material in hand
7. Point your feet in the direction of the load

6.3 Contact Stress

Contact stress is created when force is persistently applied to a specific body part. Examples of this ergonomic risk are:

- Supporting your arms, elbows, or knees on hard surfaces while you work.
Recommendation: use padding whenever possible
- Standing on narrow ladder rungs for extended periods of time places stress on the balls of your feet.
Recommendation: use step ladders instead of rungs whenever possible

6.4 Static and Awkward Postures

Prolonged static and awkward postures may rob muscles and tendons of needed oxygen supply and may contribute to cumulative trauma disorders.

- Whenever possible keep wrists and elbows in a neutral position
- Minimize overreaching by raising the work or raising the worker
- Alternate your dominant and non-dominant hands and arms
- Take adequate rest / stretch breaks

6.5 Workstation Set-Up

Adjust workstation in the following order:

1. Chair

- > Feet flat on floor
- > Knees @ 90 degree angle
- > Hips @ 100-110 degree angle

2. Keyboard

- > Close to torso
- > Elbows @ 110-120 degree angle
- > Wrists neutral

3. Monitor

- > Position monitor so that you maintain a natural 30-60 degree downward angle
- > Avoid using risers and glare screens

7.0 TOOLS AND MACHINERY

7.1 General

- Never use tools/machinery that are not designed for the job.
- Never use tools/machinery that are not in good repair. Examine each tool before use. Return tool to crib if it is not in good working order. This includes personal tools.
- Never use tools/ machinery unless you have been trained on and have demonstrated knowledge of their proper use and know their safety requirements, as well as their mechanical limitations.
- Where guards provided on tools prevent specific operations from being performed, alternate methods of guarding the point of operation and the operator can be devised. Alternate methods shall provide the same level of safety for the operator and others as the provided guard. Alternate methods must be specifically approved by Safety and Health Operations.
NEVER Remove Guarding.

- Never modify tools or machinery without proper design and test criteria from Hull or Facility Engineering and approval from Safety and Health Operations.
- When using tools that could present a hazard to others, direct work away from aisles, walkways, and other employees working in close proximity. If the direction of work cannot be controlled, shields or temporary barriers shall be used.

7.2 Hand Held Power Tools

All hand held power tools shall be equipped with a constant pressure switch or control that will shut off when pressure is released. Never secure a tool switch or control in the on or open position.

Disconnect tools when not in use, before servicing, and when changing accessories, such as blades, bits, and discs.

Never carry tools by the cord or hose.

When required, guards will be used and properly adjusted. Tool crib employees are knowledgeable in these requirements.

Electrical hand tools shall be double-insulated or properly grounded. Do not repair damage to electrical

components or wiring. See section 8,4 of this handbook.

Hand held tools that vibrate, causing an employee to grip with excessive force during operation, may require the employee to regulate the time frame the tool is used. Contact Safety and Health Operations or the Occupational Health Nurse for more information that may help prevent chronic injuries.

7.3 Machinery

Points of operation on mechanical power presses, shears, and other machinery shall be guarded for work.

Hydraulic and pneumatic power presses, hammers, and press brakes will have guards on points of operation, where possible. The unused sections of press brakes will be guarded at all times during operation. Where point of operation guarding is not feasible, efforts will be made to use hand tools, push sticks, or other means to prevent inadvertent contact with the point of operation.

If two employees are required to handle a work piece, the operating controls for both employees must be interlocked to prevent the operation of a machine without both employees' awareness.

Fixed machinery shall be securely anchored to prevent walking or movement.

When operating rotating or reciprocating machinery, do not wear gloves, neckties or loose-fitting clothing. It is strongly recommended that rings and other jewelry be avoided. If a holding device is used (such as pliers), gloves are permitted.

The operating area around machinery is to be kept clear of obstructions at all times to prevent employees from being exposed to trip hazards.

Never operate any machinery unless properly trained and authorized by the supervisor in charge of the machinery.

The operator shall ensure that all belts, pulleys, gears, shafts, and moving parts are guarded prior to operating the machinery. Machinery guarding in a walking/working surface above 7 feet is exempted.

Foot-operated machines shall be protected from accidental operation and all control switches shall be so guarded that they cannot be accidentally turned on.

No maintenance work or machine cleaning (routine or special) shall be performed on machinery until the

lock out/ tag out procedure is followed. See SPM-S-21 for details.

7.4 Special Tools - Abrasive Wheels:

Bench and/or pedestal grinders must have tool rests. The tool rest must be within 1/8" of the wheel. Tongue guards must be installed and must not exceed 1/4" from the wheel.

Do not grind aluminum on abrasive wheels marked "steel only".

Do not "groove" on abrasive wheel by grinding small objects in one spot.

Ensure that the grinding tool or machine does not exceed the RPM rating of the wheel that is being used. This may be checked at the tool crib for portable hand tools.

All grinding wheels or hand held power tools with a diameter greater than two (2 1/2) inches shall be guarded.

Wire Wheels also require tongue guards with ¼" placement.

The maintenance or mounting of grinding wheels on fixed grinding machinery requires a ring test and shall be done by properly trained personnel only.

Sanding Discs or Belts:

Never use a polishing tool to grind metal.

Belt sanding machines shall be provided with guards at each nip point.

The unused run of a belt sander will be guarded at all times.

8.0 High Risk Processes

8.1 Confined Space Entry

There are many hazards associated with entry into confined spaces. These hazards differ greatly depending on the ship's stage of construction. Poorly ventilated, sealed or freshly painted tanks have the potential to be life-threatening due to the lack of oxygen or the presence of flammable or toxic vapors. Some of the processes performed during construction create their own hazards that are amplified by the design of a confined space. Temporary exhaust ventilation is required to be installed in all confined spaces prior to entry. Many confined spaces also require that testing be performed by a Shipyard Competent Person before entry is permitted. EHS Procedure SPM-EL-01 provides detailed guidelines to ensure your safety. The procedure applies to shipboard and land-side confined spaces and must be reviewed by supervisors with their employees prior to entering confined spaces. This communication training is critical to the safety of employees. Questions involving confined spaces should be directed to the Marine Chemist at x-2398.

A confined space is defined as:

1. A room not designed for human occupancy
2. Limited access

3. Does not have adequate natural ventilation
4. Can readily aggravate an exposure – a space because of its small nature permits contaminants to be more concentrated

An enclosed space is defined as a space enclosed by bulkheads and an overhead.

8.2 Hot Work

- Hot work at all BIW facilities will be performed in accordance with SPM-EL-11. Hot work is not permitted on commissioned ships or on ships that contain fuel without a written "hot work permit" for the specific job, signed by a "Shipyard Competent Person" (SCP) (Laboratory Technician). Hot work permits are typically not required on New Construction DDG class vessels from the 01 level and above.
- All flammable liquids or combustible/ignitable materials must be removed from the work area for a distance of thirty five feet. Shielding the hot work or protecting the combustible/ignitable materials by using a fire resistant covering is also acceptable. A trained fire watch is necessary if the above precautions cannot be accomplished.

- Hot work is not permitted on hollow structural voids (i.e. pipe stanchions, railings, fair waters, bilge keels, rudders, etc.) until tested by the SCP. Internal rusting of these structures creates potentially explosive atmospheres.
- **Hot work is not permitted on coated surfaces, except as provided in SPM-IH-08.**
- Hot work permits are required on ships that contain or have contained fuel and in non-designated hot work areas such as the paint building, storage buildings, office areas, etc.
- Hot work permits are requested by the trades or supervision for a specific job and signed by the Shipyard Competent Person (SCP) after appropriate inspections are performed.
- All employees performing hot work must be trained on the requirements of SPM-EL-11 as applicable to their work location.
- Some hot work requires that a trained fire watch be assigned. This typically occurs when combustible materials cannot be effectively removed or protected.

- For your personal safety and the safety of those around you, you are responsible to inspect the work area and the opposite site of your hot work to ensure that fire hazards have been addressed. Supervisors are expected to ensure that fire hazards have been abated.
- Welding, electrode-shielded arcs, MIG, TIG, carbon arc gouging, and plasma arc cutting operations all produce intense ultraviolet radiation. This can damage the eyes, penetrate lightweight clothing, reflect from light-colored or shiny surfaces, and burn skin and eyes.
- Where practical, welding and cutting operations shall be screened off from adjacent areas by the use of permanent or temporary welding screens to prevent glare and flash from affecting other employees.
- In enclosed and confined spaces, local exhaust ventilation tubes or hoods are required on all welding functions, burning, brazing, and soldering. In the case of carbon arc gouging, a 3-foot section of metal ventilation tube shall be attached to the working end of the sucker tube.
- Appropriate eye, face and body protection is required for all burning or welding work.

- Goggles, hoods, and shields that give maximum eye protection for each cutting or welding process shall be worn by operators and their assistants (please reference the Personal Protective Equipment table in Section 2.2). Additional guidance is available in SPM-S-05.
- All burners and welders must wear flame-resistant gloves, long-sleeved shirts and avoid synthetic clothing material, in accordance with the Glove Selection Guide found at the end of this handbook. Cotton is recommended. For overhead work, leather sleeves, capes or jackets are required.
- Hearing protection shall be used if excessive noise levels are encountered (please reference the Hearing Protection Section of this handbook - Section 2.5).
- Because plasma arc cutting presents unique hazards, separate training is required in order to use plasma equipment.

8.3 Spray Painting

- Spray painting will be accomplished in accordance with SPM-EL-04.
- Most spray painting requires that a spray paint permit be obtained.
- The permit is filled out by the painting supervisor and signed by the SCP after an appropriate inspection to ensure that proper precautions have been implemented.
- Most spray painting requires that containment, temporary ventilation, proper posting of the area, appropriate lighting, removal of all temporary electrical connections, and other safety precautions be implemented prior to the actual spray job.
- Spray painting will not occur when there are spark-producing operations within 20 feet, unless authorized by the SCP.
- There shall be no eating in any spray painting area.

- When spray painting, the minimum personal protective equipment includes eye, skin, and respiratory protection in accordance with SPM-IH-03.

8.4 Electricity

Electricity is one of the major forms of power in use at BIW. Only authorized personnel shall install, repair, and maintain electrical equipment on ships, buildings, or physical plants.

Only trained, qualified, and authorized personnel may relocate, remove, repair, or alter electrical wiring or equipment in the buildings and physical plant.

Only trained, qualified and authorized personnel will maintain and install all temporary electrical services.

Shipboard electrical circuits are to be maintained by personnel who are trained, qualified and authorized.

Report electrical problems! Do not attempt to temporarily or permanently repair electrical wiring or circuits unless you are trained, qualified, and authorized to do so. Duct tape is never an acceptable repair for damaged cords, leads, or other electrical wiring. Report duct tape repairs to your supervisor.

Treat all lines and leads as if they are live. Lock-out/tag-out devices shall be used when electrical circuits or physical plants are under repair or for required maintenance purposes. These devices are to be removed only by the person who installed them, or in special cases, by a competent or authorized person directly involved in the project.

Grounding

Welding on improperly grounded material can lead to shock injuries. Ensure the structure (piece or pipe) you are welding has positive contact with the base metal before striking an arc. This may require a ground strap. Coatings or other items that cover or prevent contact with the base metal must be removed or cleaned before proceeding.

Lockout/Tagout

- SPM-S-21 addresses lockout/tagout within the facility.
- Shipboard tagout processes are controlled by DOI 10-018.
- Lockout/tagout is a process that ensures the hazardous energy is controlled. Hazardous energy can be electrical, pressure, heat, steam, water and many others.

Never attempt to energize or bypass any electrical equipment that has been red-tagged or is in the process of lock-out/tagout.

Before using any electrical equipment, make sure you have received proper training. Check all power cords, welding leads, etc., to ensure that there are no exposed wires and that insulation is in good repair. Report any needed repairs immediately to Supervision. Do not attempt any repairs yourself.

All electrical shocks are to be reported immediately and the employee shall be transported by ambulance for evaluation.

Electrical Emergencies:

- If you see that someone is captivated by an energized electrical circuit: ***Do not touch the person!***
 - De-energize the power source immediately if you are qualified or seek out a qualified person.
- Call the emergency # (2222, 1222, or 9-725-6572) to get immediate medical assistance, then notify your supervisor.**

9.0 FIRE PRECAUTIONS AND EMERGENCIES

9.1 Flammables:

Flammable materials shall not be used when less hazardous materials or methods are as effective. Liquids with a flash point of 80 degrees F or less shall be handled in accordance with established procedures (i.e., acetone, alcohol, gas, UGS-50).

Flammable liquids shall only be stored in approved buildings, containers, or areas. Small quantities may be stored in individual shops if kept in approved flammable storage cabinets or containers. All paints, oils, thinners, oily rags, solvents, and other flammable substances are to be kept in special fire resistant, covered metal containers or approved buildings when not in use. Shipboard storage of flammable material shall not exceed more than one day's use unless authorized by the Fire Chief, Marine Chemist, or Safety and Health Operations.

9.2 Fire Emergencies:

Remember that free access must be maintained at all times to all exits, fire alarm boxes, and fire extinguishing equipment. Be familiar with the locations of fire fighting and other emergency equipment in your area.

Employees are expected to extinguish small fires when possible. There is no expectation that an employee place himself or herself in danger.

Classification of Fires:

Class A. Anything that leaves an ash. With ordinary combustible materials such as wood, paper, cloth, cardboard, etc., extinguish the fire with water, or A.B.C. extinguishers.

Class B. With flammable liquids, grease, paint, or solvents, extinguish the fire by blanketing, smothering, or flame interruption using CO₂, or PKP, or A.B.C. extinguishers.

Class C. C is current - involves electrical equipment. The electrical non-conductivity of the extinguishing agent is of prime importance. Use CO₂, PKP, or A.B.C. extinguishers. **DO NOT USE WATER.**

Class D. Combustible metals such as magnesium, potassium, sodium, etc. Extinguish the fire by using dry sand, metal X, or dry compound.

Whenever a fire extinguisher is used or is discovered to have a broken seal, report it immediately to the Fire Department or a Fire Inspector, Ext. 2345.

9.3 Emergency Numbers

1. Use emergency number:

Bath	x2222
Hardings EBMF/ CW	x1222
CROF, James	9-725-6572

2. When reporting an emergency, be prepared to give the following information:
 - a. The name of the building or ship
 - b. What the emergency is
 - c. Where it is located
 - d. Which entrance to use, your name, and the phone number.

3. Report to the nearest exit to meet emergency responders.

Emergency phone number stickers for telephones are available at the Fire Department. If your phone does not have one, notify your supervisor, who will see that the phone is so marked.

9.4 Evacuation Procedures

All supervisors are required to maintain a mustering site for their crews in the event that a work site must be evacuated for any reason. (Meetings shall be conducted in accordance with Company evacuation plans.) Check with your supervisor for your mustering site. Report only missing personnel to the Fire Department Officer in charge at the scene.

There are various forms of alarms in use in the yard and on ships, including but not limited to: horns, bells, buzzers, and public address systems. You must be aware of the alarm in your area.

A Fire Safety Plan has been developed by the Fire Department and is available on the BIW Intranet (Environment/Health/Safety, EHS Mgmt System, BIW Emergency Response Manual, Evacuation Procedures). The intent of the plan is to provide employees with a set of procedures to ensure they are protected from fire hazards in all aspects of shipyard employment, regardless of geographical location.

10.0 WARNING SIGNS/BARRIER TAPE

- 10.1 General - It is important to remember that tape and signs are one form of communication used in the shipyard, and it is important to read the message on the sign and adhere to that message. If signs are missing, avoid entering the area for your own safety and report the issue to the nearest supervisor. For more information, see SPM-S-11.
- 10.2 YELLOW CAUTION TAPE is used to secure an area when performing a job that may present an intermittent hazard of low risk that requires extra precautions. Only "Caution" signs will be used with yellow caution tape.
- 10.3 ORANGE DO NOT ENTER TAPE is used to secure an area when performing a process or an operation that contains potential hazards of higher risk such as missing fall protection, potential falling material, burning paint, etc. See list below. Only Do Not Enter signs will be used with orange Do Not Enter tape.

- Falling Material (Load Outs/Suspended loads, Scaffold Erection and Dismantling, Overhead Crane Work, Staging Blow Down)
- Chemical/Substance Exposure (Blasting and Spray Painting, MDI Reefer Job, Burn Paint Enclosures, Large Scale Grinding/Prepping Operations, Lead)
- Lack of Fall Protection/Slippery Conditions (Unit Erections, Ice & Snow Conditions)
- Biological Agents (Blood Cleanup)
- Yard Security (Security Barriers)
- Load Testing (Static & Dynamic Testing, Machinery Testing)
- Strike-By Exposure (Milling Machine Operation, Unit Lifting and Jacking, Line Handling)
- Energy Release Exposure (Working Live Power, Shore Power Hook Up Zones)

Personnel seeking entry into the secured area must obtain permission from the supervisor(s) in charge or the designee before entering the area.

Any other use of Do Not Enter Tape and Signs other than those established in the list above requires the evaluation and permission from the Environmental, Health and Safety Division

- 10.4 RED DANGER TAPE is used by Safety, Health, and Environmental representatives exclusively. It is used in situations where imminent danger(s) or severe hazard(s) may exist. Only personnel authorized by Safety, Health, and Environmental Operations may be permitted to enter the boundaries of red danger tape. Only "Danger" signs shall be used with red danger tape.
- 10.5 MAGENTA/YELLOW striped tape is used by Non-Destructive Testing personnel. It is used to warn against potential radiation hazards during the NDT process. No one is permitted in the area during testing.
- 10.6 RADIO FREQUENCY RADIATION Hazard sign is used to communicate the potential danger when antennas rotate and/or radiate. Do not pass beyond this sign.

- 10.7 NOTICE SIGNS are used only to communicate general information to the employees. Examples are the closing of a passageway, disposal of waste material(s), and general trade work. It may be appropriate to have a Notice sign give direction to "Do Not Enter" to protect a production process, i.e., curing of paint. Notice signs may not be used with any barrier tapes, i.e. "Caution", "Do Not Enter", or "Danger" tape.
- 10.8 The correct sign will be hung with the appropriate tape. The sign will include the reason for the direction, the supervisor(s) (or designee) name or point of contact, the date when starting, and phone extension or beeper number.
- 10.9 Only the supervisor in charge or his or her designee can give unauthorized personnel permission to enter the secured area.

10.10 Tape and sign barriers shall be properly maintained i.e., tape and signs damaged by weather shall be replaced. Upon completion of the task, all tape and signs must be removed and disposed of promptly. It is the responsibility of the person who installs the tape and sign(s) to maintain compliance for the duration of the process.

11.0 HAZARDOUS WASTE MANAGEMENT

All waste material shall be handled in accordance with established procedures and placed in the appropriate container to ensure proper disposal. Every employee is responsible for discarding waste into the proper container. SPM-EL-06 details specific instructions for handling hazardous waste. SPM-EL-23 further specifies requirements for those employees assigned to the central accumulation buildings.

11.1 General

BIW Environmental Operations personnel make every reasonable effort to identify hazardous wastes generated at BIW. Any employee generating a waste that is suspected to be hazardous should contact a supervisor or Environmental Operations to make a proper determination. At BIW, potential hazardous wastes include (but are not limited to) the following:

- Boiler soot and debris
- Waste antifreeze with lead
- DOP plasticizer
- Developer/cleaner fluid
- AFFF contaminated with lead
- Sodium hydroxide solution

- Photographic fixer
- Rydlyme/water
- Irridite solution
- Gasoline/diesel and debris
- Chromic acid
- Tectyl 891 with thinner
- Waste mercury
- Lead paint and debris
- Waste paint and solvent wash

Only trained personnel can handle hazardous waste. Training consists of annual classroom training on Hazardous Waste Management.

Hazardous waste transported within the Bath facility must have a fluorescent orange shipping tag with the preprinted words "Ship To: HAZARDOUS WASTE STORAGE BUILDING." This label must be affixed to the secured container prior to transporting.

11.2 Hazardous Waste Collection

- Hazardous waste must be accumulated in containers that are compatible with the material.
- Storage of hazardous waste containers must be in approved locations.
- Waste paint should be poured off directly into the collection drums located at the accumulation stations. Waste is not to be placed outside designated storage buildings.

11.3 Labeling

All Hazardous waste must be clearly labeled to identify the material and must have the proper markings. Every container of hazardous waste at BIW must have the following markings at a minimum:

- Proper name of the waste (for example, "Waste Paint")
- A yellow Hazardous Waste Label with the words "Hazardous Waste"; and
- The accumulation start date.

In most cases, Hazardous Waste personnel will pre-label containers. If a container is not labeled, Environmental Operations shall be contacted at x1635.

11.4 Waste Paint and Solvents

These are to be accumulated at designated locations throughout the shipyard. In general, these are the white buildings labeled “HazStor” found at each facility.

When authorized by Environmental Operations, “Satellite Accumulation Areas” can be established for small quantities of waste.

Hazardous Waste Personnel check all storage and satellite areas each day waste is being generated. Each facility designates personnel to relocate waste from these locations to a 90-Day Hazardous Waste Storage area when the containers become full, where they await shipment by a licensed hazardous waste transporter.

11.5 Paint Kits and Debris

Paint kits are to be returned to the paint issue station promptly. The attendant will then determine if the paint can be re-issued. Waste paint shall be poured into the appropriate hazardous waste drum by the paint issue station attendant, when determined to be of no further use. Used rollers, paint brushes, stirring sticks, empty cardboard containers, etc., are to be placed in the paint debris boxes located near the Issue Stations.

Note: This material must contain no free liquids. The presence of free liquids will render the debris hazardous. All free liquids should be returned to the Paint Issue Station or poured off into the proper drum at the collection location.

11.6 Aerosol Spray Cans and Hand-Held Disposable GasCylinders

Spent aerosol cans and gas cylinders are to be placed in the fluorescent orange cans marked "SPENT AEROSOL CANS" located throughout all production areas. Non-empty spray cans are to be returned to the Tool Issue Room for re-issue.

11.7 Dip Tanks

Area Management must contact Environmental Operations to coordinate removal and disposal of the tank contents from the following tanks:

- Brulin tanks
- Parts washer tanks
- Waveguide tanks
- Label plate shop tanks
- Bernite tanks

Note: To prevent inadvertent contamination, dip tanks should only be utilized for their intended purpose.

11.8 Corrosive Liquids (i.e. chromic acid, boiler treatment chemicals, etc.)

Waste corrosive liquids shall be collected in DOT-approved corrosive liquid containers by the generating department and sent to the Hazardous Waste Building immediately for accumulation and storage. **Note: Corrosive liquids must not be mixed together or with other material without approval from the Environmental Operations Department.**

11.9 Miscellaneous Hazardous Waste

Many of the Hazardous Materials utilized at BIW could be hazardous waste if discarded. Employees are responsible for contacting supervision if the proper disposal method for a hazardous material is not known. Area Management is responsible for coordinating disposal of any other wastes with the Environmental Operations Department.

12.0 SPECIAL WASTE

12.1 General

Certain types of waste are not classified as “hazardous waste” by EPA, but do require special handling. SPM-EL-20 outlines the requirements for managing special wastes. Personnel handling asbestos must be properly trained in accordance with safety & health procedures.

12.2 Oil Filters

Used oil filters at Bath are to be transported to the Maintenance Garage for crushing. At Hardings, used oil filters are to be placed in marked drums for proper disposal.

12.3 Blast Grit

Spent abrasive is to be cleaned up as soon as feasible to prevent contamination from “shipyard debris” and other pollutants. Each type of abrasive media (aluminum oxide, steel shot, and garnet) is to remain segregated from first use to disposal, to facilitate recycling where possible. Spent abrasives must be disposed of in labeled drums or roll-offs.

12.4 Asbestos

Must be disposed of in proper containers provided by Environmental Operations, and is to be handled by trained employees only.

13.0 UNIVERSAL WASTE

13.1 General

Universal wastes are hazardous wastes that can be recycled. SPM-EL-24 outlines the requirements for managing universal waste. Any employee designated to handle Universal Wastes must receive Universal Waste Training.

13.2 Fluorescent Light Bulbs

Spent bulbs must be packaged by **trained** employees and shipped to the Central Accumulation Storage Area.

Accumulation areas are designated at each facility generating spent bulbs. For Bath this is Building 63, Hazardous Waste Building. Spent fluorescent bulbs from EBMF and CW are transported to Hardings for accumulation. Hardings Central Accumulation Area is by the Paint/Blast Building.

13.3 Computer Monitors (CRT's)

Cannot be discarded into general trash. Contact Environmental Operations for proper disposal.

13.4 Spent Batteries:

Battery disposal at BIW falls into two categories:

- Alkaline Batteries: All spent batteries marked alkaline can be disposed of in any regular trash container (*example: Size D batteries used in flashlights*).
- All Other Batteries: All other batteries must be returned to the tool crib or shipped to the Hazardous Waste Storage area (*example: Batteries used in automobiles, Ni-Cd batteries used in emergency lighting or power tools, lithium batteries used in digital cameras*). **The above described waste must never be thrown in the trash.**

14.0 NON-HAZARDOUS SOLID WASTE

14.1 General

Non-hazardous solid waste must be managed in accordance with SPM-EL-20. BIW is committed to recycle as much of its waste as possible. Proper segregation of wastes is crucial to recycling and preventing unnecessary waste from entering landfills. The following is a breakdown of where non-hazardous waste must be placed.

14.2 Container Accessibility

Area Management and Supervision are responsible for making color-coded containers (Red, Yellow, Gray and Brown) accessible to waste handling vendors. This includes ensuring that containers are lifted off ships and units and placed in designated areas in time for pick-ups. Red Totes brought into buildings must be returned to the outside of the building for proper processing prior to the end of 3rd shift. SPM-EL-20, Solid Waste Management Procedure, outlines these requirements as well as the waste pick-up schedules.

14.3 Wood Disposal

Scrap wood must be placed into GRAY containers marked "Wood Only" or directly into roll-offs labeled "Wood Only." Large or bulky pieces of scrap wood should be banded together on pallets for easier transport.

14.4 Scrap Metal Disposal

In general, scrap metal is to be placed into YELLOW containers for recycling. **Note:** Certain areas, such as the Pipe Shop and Machine Shop have their own containers for scrap pipe or turnings.

14.5 Cardboard Disposal

Cardboard must be placed in BROWN containers for proper recycling. Every effort should be made to break down the cardboard to maximize space in the containers.

14.6 Cloth Rag Disposal

Shop towels are sent off-site for cleaning and re-use. In order to facilitate this process, dirty rags must be placed in the BROWN 20-gallon TRASH CANS and remain covered at all times. Rags saturated with liquid (i.e., solvents, paints, etc.) must be sent to Hazardous Waste.

14.7 Shipyard Waste Disposal

All other non-hazardous waste that does not fall into any of the above categories is to be thrown away in any of the RED receptacles or an OST trash chute.

NOTE: Never throw away any hazardous, special or universal wastes, or recyclable items into a red shipyard waste container.

15.0 SPILL PREVENTION & RESPONSE

15.1 General

- Chemical or oil (such as lube, hydraulic, or fuel) spills can create hazardous conditions and damage the environment. Even spills onto impervious surfaces, such as pavement, can eventually lead to environmental harm when storm water washes the residues into the river.
- All employees are responsible for following Best Management Practices (BMPs) as outlined in SPM-EL-15, when handling materials which could spill. Spills must be handled and reported in accordance with SPM-EL-03.

15.2 Spill Response

Incidental spills must be immediately contained and cleaned up by the person conducting the process that resulted in the spill. If additional material or help is needed contact:

Bath Hazardous Waste Buildings, Ext 3018
EBMF, Ext 2784
Hardings, Ext 1747,

Note: An *Incidental Spill* is a small quantity that results from normal operations (i.e., paint spillage during mixing, oil drips from filling of equipment. Etc). These types of incidents are minor and should be handled by the individuals at the locations.

For spills of unknown material or spills that are beyond your own ability to clean-up, contact the emergency numbers in Section 5.3 for assistance.

When an employee recognizes a spill of a flammable or combustible liquid such as paint or oil aboard a vessel at BIW, he/she will notify those in the immediate area who are performing hot work to cease the operation. The employee will then notify supervision and/or the fireguard so announcements can be made over the intercom system. Supervisor or the fireguard will call the facility's emergency number so an assessment of the conditions can be made. The Laboratory will determine if hot work may continue.

15.3 Spill Notification

To Report Spills:

- EBMF, Hardings x1222
- Bath and all other facilities x2222

15.4 Petroleum Product Transfers

Transfers of petroleum products create the potential for significant spills. All transfers of petroleum product to or from ships must be done in accordance with the BIW Petroleum Transfer Operations Manual. This manual details the specific requirements to safely transfer petroleum products. It specifically requires that only Qualified Personnel, as deemed by the Chief Operating Engineer, can conduct transfers. **Note:** this includes the transfers to and from all dry dock fuel oil, lube oil and waste oil tanks. All other types of petroleum product transfers must be done in accordance with SPM-EL-25.

15.5 Material Storage

Employees shall ensure materials such as oils, paints, and solvents are stored in adequate secondary containment, so that accidental spills or leaks cannot reach the receiving waters.

Material storage must be located away from receiving waters and catch basins, and in low-traffic areas.

Temporary staging of liquid materials (paint, solvent, oil etc.) shall be located away from storm drains.

The mixing of paints and solvents shall be carried out in locations and under such conditions that no accidental spills may enter the receiving waters.

Hand-carrying open containers of oil, solvents, or paints shall be prohibited to the maximum extent practical.

All containers of product must be covered when not in use.

Proper spill containment shall be utilized on all exterior operations where petroleum products are used, such as CPP system fill and test or void space fill and drain operations, to prevent accidental leaks or spills from discharging directly into the river.

Pallets, boxes, bags, containers, bundles, etc. stored in tiers shall be blocked, interlocked, and limited in height so that they are stable and secure at all times. Only use pallets in good repair.

Pallets and material storage reduce the handling necessary to transport material into production areas, as well as removing the finished product from shop areas.

Designated storage areas shall allow clearance between storage and automatic sprinkler heads of approximately 18".

Materials handled from aisles must allow for the turning radius of any vehicle to be used.

Employees shall keep material out of aisles and off of loading and unloading areas. These areas should be marked with painted lines and signs.

The employee handling material shall be responsible for establishing visible barriers or signals for material that temporarily extends into walkways, roadways, etc.

All exits and aisles, automatic sprinkler system controls, electrical panel boxes, fire hoses, extinguishers and other emergency equipment must be maintained and unobstructed at all times.

16.0 AIR EMISSIONS

16.1 Paint Usage

BIW is limited to the amount of Volatile Organic Compounds (VOC's) that can be contained in paint. The regulation that dictates this is referred to as NESHAP. SPM-EL-16_outlines the specific requirements for using paints on ships or ship parts.

In general, the following requirements apply:

- The type and amount of thinner that can be used with a particular coating is controlled.
- Contact the Paint Warehouse at x3306 to determine if a coating can be thinned
- If a coating can be thinned, the Warehouse will issue the proper thinner in the allotted amounts.
- Paint and solvent containers must be covered at all times unless material is being added or removed from the container or the material is being mixed.

16.2 Exterior Blasting and Painting

To ensure compliance with regulations, BIW has established Best Management Practices (BMPs). BMPs are BIW's required practices to minimize environmental impact. SPM-EL-15 contains specific information on the proper BMPs for exterior blasting and painting.

Some examples of BMPs are:

- Blasting and mechanical cleaning activities must be contained to the maximum extent practical to prevent abrasives, dust, and paint chips from polluting the atmosphere and/or reaching the receiving waters. While in drydock, the “enviro-screen” must be in place at both ends of the drydock during blasting activities.
- Uncontained, exterior abrasive blasting on hulls located in the water, or within close proximity where media may enter the water, is prohibited.
- Spray painting activities must be enclosed, covered, or contained, to the maximum extent practical, to prevent overspray from polluting the atmosphere and/or reaching the receiving waters.
- Exterior abrasive blasting and/or spray painting are prohibited when the wind velocity exceeds 20 miles per hour from any direction at the nozzle.
- Blasting units and associated pollution control equipment are to be operated and maintained at maximum efficiency.

16.3 Miscellaneous Air Issues

Dust collectors (i.e., Torrits, baghouses, and rotoclones) are to be maintained in good repair. There should be no visible emissions from these types of units.

Releases of Refrigerant or Halon, whether inside or outside, need to be reported to the Environmental Operations Department at Ext. 1635 for proper documentation.

17.0 WATER DISCHARGES

BIW generates many process wastewaters. These are wastewaters that result from the introduction of water into an industrial setting. Proper handling and disposal of waste water is critical to protecting our environment.

SPM-EL-21 outlines the specific requirements for handling wastewater, and should be referred to for the most up-to-date list of water discharge requirements.

SPM-EL-15 outlines the specific requirements to minimize contamination to storm water runoff. At BIW the main types of water discharges are:

1. Direct to a water body,
2. Sewer discharges (with and without pretreatment)
3. Storm Water discharges
4. Snow Dumps

17.1 Water Discharge BMPs

At a minimum the following BMPs must be followed for water discharges of any kind:

- There must be no visible oil residues or sheen (unless being discharged to the sewer through an oil/water separator;

- All decks, surfaces and other areas that water may come in contact with must be swept clean prior to using water;
- All debris must be contained;
- No cleaners or other chemicals are to be added (with the exception of Iron Out) without approval from Environmental Operations.

SAFETY/ENVIRONMENTAL HANDBOOK

	Direct Discharge	Direct Discharge to Sewer	Discharge to Sewer w/Pre-treatment	Collection
Discharge Stream				
flame straightening (Bath)	X			
sonar dome hydro test	X			
clean storm water pumped from units and spaces under construction	X			
building wash without cleaners or chemicals	X			
hull deck wash with Iron Out (<3,000 psi)	X			
hull wash to remove marine growth (3,000 to 10,000 psi)	X			

SAFETY/ENVIRONMENTAL HANDBOOK

Discharge Stream	Direct Discharge	Discharge to Sewer	Sewer w/Pre-treatment	Collection
snow from plowing and shoveling roads and walkways	X			
2nd rinse and subsequent from TSP/Citric and ChemCrest flushes		X		
boiler blow down		X		
pipe hydro test		X		
metal quenching		X		
potable water tank chlorinating and disinfecting		X		
potable water tank rinse		X		
flame straightening (EBMF)		X		
Brulin rinse		X		
HVAC cooling tower		X		
wash water from exterior vehicle power washing		X		
wash water from power washing air filters from ship de-misters, air condition units, etc.		X		
Aqua Miser process water		X		
blast settling tank wastewater		X		

SAFETY/ENVIRONMENTAL HANDBOOK

Discharge Stream	Direct Discharge	Discharge to Sewer	Sewer w/Pre-treatment	Collection
others as approved by the POTW		X		
oily water from ship bilges			X	
photo process discharge			X	
air compressor oily water			X	
hull blast water (.10,000 psi) via drydock storm water collection tanks			X	
Strip-it and Time Saver process water			X	
machine shop coolant water after filtration			X	
waste oil missile water after separation			X	
TSP/Citric Acid and ChemCrest 1st flush and rinse				X
Wave Guide rinse				X
Wave Guide cleaning solution				X
AFFF solution from system testing				X
machine coolants				X
bilge cleaning with cleaners				X

SAFETY/ENVIRONMENTAL HANDBOOK

Discharge Stream	Direct Discharge	Direct Discharge to Sewer	Discharge to Sewer w/Pre-treatment	Collection
blast vacuum and rotoclone water				X
Brulin solution				X
RDP solution used for any surface preparation or cleaning process				X

This list is not "all-inclusive." Any department that generates wastewater from a process that is not outlined above must notify Environmental Operations to determine proper handling.

17.2 Storm Water Discharges

Run-off from storm water has the potential for creating a significant impact to the water surrounding BIW facilities. As pollutants from various operations (welding, burning, grinding, painting, blasting, etc.) fall to the ground, they can get washed into the river and negatively impact the river or other nearby streams.

The best and most effective way to prevent storm water run-off from causing water quality problems is to keep areas that rain water contacts clean. Picking up debris and sweeping at the completion of a job or shift are the most effective ways that can be done.

SPM-EL-15 contains the BMPs that need to be followed to minimize impacts from storm water run-off.

18.0 COMMUNITY NOISE CONTROL

BIW has an obligation to be a responsible citizen in the communities we operate in. All of BIW's manufacturing facilities are situated in residential areas and are subject to community noise control standards. These community noise standards set limits on shipyard noise for daytime hours (7AM-7PM) and more stringent limits for nighttime hours (7PM-7AM). To ensure compliance with these standards and to prevent disturbing our neighbors, there are several best management practices that need to be followed. SPM-EL-22 lists in detail the BMPs for reducing the impact of shipyard noise on our neighbors. Several of the key BMPs are as follows:

- All solid waste and recycling containers at the Brunswick facilities are to be picked up after 7 AM.
- Coppos blowers used on the LLTF are to be covered with sound control boxes to the maximum extent possible.
- Nighttime (7PM-7AM) blasting jobs in the dry dock are to be limited to 2 blast lines on either side of the hull at any one time.
- During the summer months the West Side bay doors on the POII are to be kept closed from 9PM-7AM.
- The use of the 1MC intercom system is to be limited to day time use as much as possible.

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