

3.0 RULES PROTECTING WORKERS FROM NOISE, AND HAZARDOUS MATERIALS INHALATION, ABSORPTION, AND OTHER BODILY AND SENSE ORGAN INTAKES

A. General

Under the Occupational Safety and Health Act, the Occupational Safety and Health Administration (OSHA) has promulgated standards that apply generally to all employers and standards that apply to specific industries. Part 1910 of the regulations¹ applies generally to all employers. Part 1915 of the regulations² applies specifically to shipyard employment.³

Shipyard employment includes shipbreaking and related employment. "Shipbreaking" means any breaking down of a vessel's structure for the purpose of scrapping the vessel. This includes the removal of gear, equipment, or any component part of a ship.

"Related employment" means any employment performed incident to or in conjunction with shipbreaking work. Inspection, testing, and employment as a watchman are examples of related employment. Employees at dry docks, graving docks, and marine railways would ordinarily be protected by the regulations.⁴ A vessel's master, officers, and crew, and anyone engaged by the master to repair any vessel would not be considered employees of the ship breaking/recycling facility.

The shipyard employment standards generally apply to ship breaking/recycling facilities. A standard in part 1915 that is specifically applicable to a particular aspect of ship breaking/recycling will prevail over a different, general standard in part 1910. However, a general standard will apply where the industry standards do not impose different requirements.⁵ For example, as noted below, there is no specific shipyard noise exposure standard in part 1915. Consequently, the general standard in part 1910 regulating noise exposure, 29 CFR § 1910.95, applies to ship breaking/recycling.

Not all of the regulations in part 1915, which covers all shipyard employment, apply to ship breaking/recycling. Some of the regulations by their terms exclude shipbreaking—thus excluding ship breaking/recycling—and apply only to shipbuilding or ship repair. Moreover, other regulations, although applicable to shipbreaking, will not as a practical matter substantially affect ship breaking/recycling.

Typically, when a ship is recycled, it is hauled up an incline and cut into pieces with saws, cutting torches, or large industrial shears. Insulation and other material that could either generate toxic fumes or ignite are often removed, either by hand or through grit blasting, before the ship is cut.

Large components are removed from the ship as they are exposed. The scrap metal may be cut to the desired size, either directly from the ship's hull or onshore, from larger pieces weighing as much as 20 to 30 tons. Sometimes parts of the ship are shredded and the metal and nonmetals are separated later.

Vessel recycling does not entail as much work in confined or enclosed spaces as shipbuilding and ship repair. Therefore, the regulations applicable to these activities⁶ will have less impact on the day-to-day work at a ship breaking/recycling facility than in a traditional shipbuilding or repair yard.

B. General Duty Obligation

Workplace standards cannot cover every possible safety and health problem. Therefore, Congress included in § 5(a)(1) of the Act⁷ a "general duty" clause. This clause requires employers to furnish employment and a place of employment "free from recognized hazards that are causing or likely to cause death or serious physical harm" to employees.

The general duty applies to "recognized hazards" in the workplace that are likely to cause serious physical harm and that feasibly may be eliminated.⁸ A recognized hazard is one of which an employer either had or should have had knowledge.⁹ In the event of a dispute, the Occupational Safety and Health Administration (OSHA) is responsible for determining whether a workplace hazard is likely to cause serious physical harm. An affirmative determination by the OSHA will be upheld as long as that hazard could result in serious physical harm other than through "a freakish or utterly implausible concurrence of circumstances."¹⁰

C. Competent Person Requirement

Throughout subparts B (confined and enclosed spaces), C (surface preparation and preservation), D (welding, cutting, and heating), and H (tools and related equipment) of part 1915, tests and inspections are required to be performed by a marine chemist, certified industrial hygienist, or some other "competent person."

The "competent person" must be capable of recognizing and evaluating employee exposure to hazardous substances or to other unsafe conditions and specifying the necessary precautions to be taken before work may be performed. For performing certain tests and inspections¹¹ in connection with surface preparation or in areas where there is no flammable hazard, a "competent person" need only satisfy § 1915.7(c), which simply requires knowledge of the regulations and the location where the work is to be done, and an ability to follow directions and use testing equipment.¹²

The impact of the "competent person" requirement upon the ship breaking/recycling industry is clear. Trained personnel must be available whenever ship breaking/recycling activities are taking place. The facility's employees must know when a "competent person" must be called upon to make an inspection and a decision prior to work commencing or continuing.

D. Hazard-Specific Requirements

1. Noise

The general noise standard applies to ship breaking/recycling operations. Routine ship breaking/recycling operations such as cutting and grit blasting will produce noise levels in excess of 100 decibels A-weighted (dBA). When employees are subjected over a constant period of time to sound exceeding the levels set forth in § 1910.95, feasible administrative or engineering controls must be utilized to reduce the noise. As shown in Table 1, these noise levels range from 90 dBA over an 8-hour period to 115 dBA over a period of 15 minutes or less. If administrative or engineering controls fail to reduce sound levels to that prescribed in the regulation, personal protective equipment must be provided by the employer. Obviously, a ship recycler will have to carefully monitor the noise level and be able to implement quickly any necessary corrective action.

Table 1. Limits on Amount of Time an Employee Can Work at Various Sound Levels, as Mandated by OSHA

Sound Level	Duration (per day)
90 dBA	8 Hours
92 dBA	6.1 Hours
95 dBA	4 Hours
97 dBA	3 Hours
100 dBA	2 Hours
102 dBA	1.5 Hours
105 dBA	1 Hour
110 dBA	0.5 Hour
115 dBA	0.25 Hour

2. Air Contaminants

Ship breaking/recycling generates air contaminants that are regulated by OSHA. Asbestos is found in pipe lagging, adhesives, tiles, gaskets, valve packing, electric cable covering, heat shields, putty, acoustic and thermal insulation, and pipe hangers. On older ships, asbestos is in the engine room, on the boat deck, and on the main deck. Lead is found in ballast, paint, cable coverings, gaskets, and plumbing joints. It is found throughout older ships, from the bilges to the boat deck. Manganese, nickel, chromium, iron, and aluminum are in shipboard metals. Chromium compounds are in paint. Coal tar pitch is used in epoxy in bilges. Chlorodiphenyl is found in some acoustic insulation, electrical components, and gaskets. Fibrous glass is used in insulation and patches not essential for watertight integrity. Ozone is produced by electric sparks. Carbon dioxide and carbon monoxide are produced by combustion. These materials and miscellaneous particulates are released during ship breaking/recycling, through torch cutting, grinding, sawing, and grit blasting. Toxic, volatile solvents such as acetone are used for surface preparation and cause toxic fumes.

The contaminants released in ship breaking/recycling can have acute and chronic toxic effects on workers and may cause cancers. For example, lead can cause poisoning and long-term damage to the central nervous system. Cadmium is poisonous and over the long term can cause lung cancer and kidney disease. Benzene poisoning can cause convulsions. Long-term benzene exposure can cause anemia and leukemia. Asbestos can cause lung disease and cancer.

In the case of most contaminants released in ship breaking/recycling, the limiting factor in the development of an overall exposure limit is the cancer risk to the worker. Although ingestion and, in some cases, absorption of these contaminants is possible, inhalation is the main pathway of concern.

Chromosomes regulate cells and store genetic material. Mutation of a chromosome can result in a failure of cellular control mechanisms and can lead to cancer in the exposed worker. Contaminants released during ship breaking/recycling can also cause genetic and embryonic or fetal damage. If the mutation is present in a gamete, the mutation can be passed to the worker's offspring. Chromosome breaks can result in the deletion or translocation of genetic material, both of which can cause serious reproductive disorders.

Exposure of a pregnant woman to ship breaking/recycling contaminants can damage the fetus. During its periods of rapid tissue differentiation and growth, the fetus is very susceptible to injury, even at exposure levels well below those harmful to either parent. In a pregnant woman, lead crosses the placenta and lead concentrations in umbilical cord blood are nearly equal to those in maternal blood. The OSHA standard, however, is probably not sufficient to protect a fetus. Lead below the OSHA standard of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) poses developmental risks both to young children and to fetuses.

Lead may pose reproductive hazards to men as well as women. Lead is concentrated in the male reproductive system. Exposure to lead results in lowered sperm count and reproductive failure in

men, and may also result in harm to offspring. Benzene and carbon monoxide also pose a reproductive hazard, but their biological half-lives (hours or days) are relatively short when compared to lead (years).

It is not clear that OSHA's mission extends to protection of workers' offspring. Nonetheless, a ship breaking/recycling facility could be liable for negligently causing genetic damage or damage to a fetus. This is an area that requires some delicacy and considerable thought, because an overzealous fetal or genetic protection policy may subject the facility to liability for gender-based discrimination.

a. General Exposure Limits

The shipyard regulations¹³ contain roughly 400 exposure limits for various air contaminants that are considered toxic and that are likely to be encountered in ship breaking/recycling. These are derived from the 1970 Threshold Limit Values (TLVs) of the American Conference of Governmental Industrial Hygienists. For some contaminants, the exposure limit must never exceed the exposure limit given for that substance. If instantaneous monitoring is not feasible, the ceiling is a 15-minute time-weighted average exposure, which must not be exceeded at any time over a working day. There is such an instantaneous standard, for example, for manganese compounds and manganese fumes; in both cases the limit is 5 milligrams per cubic meter (mg/m^3).

For most other air contaminants, the exposure limit must not exceed a substance-specific, 8-hour time-weighted average in any 8-hour work shift of a 40-hour workweek. The exposure limits for air contaminants likely to be encountered in ship breaking/recycling are listed in Table 2.

b. Standards and Practices Applicable to Asbestos, Lead, Cadmium, and Benzene

The regulations contain specific standards and practices regulating occupational exposures specifically to asbestos, lead, cadmium, and benzene.¹⁴ These substances may be encountered during vessel recycling in products such as thermal insulation (asbestos), paint (lead), metal plating (cadmium), and solvents (benzene). These regulations are more detailed than the exposure limits listed in Table 2. Typically, these regulations contain a combination of additional requirements, such as worker practices and action levels. The action levels, short-term exposure limits, and permissible exposure limits for asbestos, lead, cadmium, and benzene are listed in Table 3.

The regulations contain an asbestos¹⁵ PEL of 0.1 fiber per cubic centimeter (f/cm^3) of air averaged over an 8-hour workday and 1 f/cm^3 over a 30-minute period. The regulations

Table 2. Exposure Limits for Air Contaminants

Air Contaminant	Maximum Exposure (8-hour time-weighted average)
Aluminum	Total dust: 15 mg/m ³ Respirable fraction: 5 mg/m ³
Acetone	1,000 parts per million (ppm); 2,400 mg/m ³
Carbon Dioxide	5,000 ppm; 9,000 mg/m ³
Chlorodiphenyl (42% chlorine)	1 mg/m ³
Chlorodiphenyl (54% chlorine)	0.5 mg/m ³
Chromium Compounds	0.5 mg/m ³
Chromium Metal and Insoluble Salts	1 mg/m ³
Coal Tar Pitch Volatiles	0.2 mg/m ³
Fibrous Glass	Total dust: 15 mg/m ³ Respirable fraction: 5 mg/m ³
Iron Oxide Fumes	10 mg/m ³
Ozone	0.1 ppm; 0.2 mg/m ³
Nickel	1 mg/m ³
Particulates Not Otherwise Regulated	15 mg/m ³

Table 3. Exposure Limits for Asbestos, Benzene, Cadmium, and Lead

Contaminant	Action Level	Short-Term Exposure Limit	Permissible Exposure Limit (8-hour workday)
Asbestos	--	1.0 fiber/cm ³ (30-minute period)	0.1 f/cm ³
Benzene	0.5 ppm	5 ppm (15-minute period)	1 ppm
Cadmium	2.5 µg/m ³	--	5 µg/m ³
Lead	30 µg/m ³	--	50 µg/m ³

prescribe certain worker practices¹⁶ that apply to virtually all shipyard work where asbestos is present and include a fit test protocol for respirators and the air analysis and quality control procedures that must be used. The regulations also require medical surveillance and employee notification.

Similar requirements apply to occupational exposures to lead, cadmium, and benzene. The PEL for lead¹⁷ is 50 µg/m³ of air averaged over an 8-hour workday. The action level is 30 µg/m³ of air, also based on an 8-hour workday. The action level triggers several requirements such as exposure monitoring, medical surveillance, and training and education.¹⁸ Levels of these magnitudes may be encountered during grinding or torch cutting of metals containing lead.

The PEL for cadmium is 5 µg/m³ of air averaged over an 8-hour workday. The action level is 2.5 µg/m³ per cubic meter of air, based on an 8-hour workday.¹⁹ The PEL for benzene is 1 part of benzene vapor per million parts of air (ppm) for an 8-hour workday, and the maximum short-term exposure limit is 5 ppm for any 15-minute period.²⁰

3. Surface Preparation

Toxic cleaning solvents such as acetone may be used in surface preparation for cutting steel ship hulls and superstructure. When toxic solvents are used, the cleaning operation must be completely enclosed to prevent the escape of vapor into the working space. Natural ventilation or mechanical exhaust ventilation must be used to remove the vapor at the source and to dilute the concentration of vapors in the working space to a concentration which is safe for the entire work period. Employees must be protected against toxic vapors from these solvents by respiratory protective equipment and, where necessary, against exposure of skin and eyes to contact with toxic solvents and their vapors by suitable clothing and equipment.²¹

When flammable solvents are used, additional precautions must be taken. Smoking, open flames, arcs, and spark-producing equipment may not be used in an area where these solvents are being used. Ventilation must be provided so that the concentration of vapors is below 10 percent of their lower explosive limit, and frequent tests must be made to determine the concentration. Scrapings and rags soaked with these materials must be kept in a covered metal container. Only explosion-proof lights may be used. All power and lighting cables must be inspected to ensure that the insulation is not cracked or worn, that there are no connections within 50 feet of the operation where the solvents are being used, that lines are not overloaded, and that the cables are suspended with sufficient slack to prevent undue stress or chafing. Fire extinguishing equipment must be immediately available in the work area.²²

Greasy and soft preservative coatings may not be removed by flame or heat. Hardened preservative coatings may not be removed by flame in enclosed spaces unless the employees exposed to fumes are protected by air line respirators. Employees performing this operation in the open air, and those exposed to the resulting fumes, must be protected by a fume filter respirator.²³

Ship recyclers frequently use abrasive blasting to clean and prepare the hull of the ship prior to cutting. If abrasive blasting is used, the hoses must be of a type to prevent shocks from static electricity. Hose lengths must be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings. Nozzles must be attached to the hose by fittings that will prevent the nozzle from becoming disengaged by accident. Nozzle attachments must be metal and fit onto the hose externally. A dead-man control at the nozzle must either provide direct cutoff or signal the operator to cut off the flow. Hoses and all fittings used for abrasive blasting must be inspected frequently to ensure timely replacement before an unsafe amount of wear has occurred.

Abrasive blasters must be protected by hoods and air-fed respirators or by positive-pressure air helmets and protective clothing. Abrasive blasters working in the open may use filter-type respirators when synthetic abrasives containing less than 1 percent free silica are being used. Employees other than blasters, including machine tenders and abrasive recovery men, working in unsafe concentrations of abrasive materials and dusts must use eye and respiratory protective equipment.

4. Cutting and Heating

Scraping activities very seldom take place in enclosed spaces on a ship. Nonetheless, it is possible that cutting or heating in closed spaces might be required if, for example, a piece of equipment attached to a bulkhead or deck had to be removed before a ship's hull could be cut. Cutting or heating²⁴ any of the following metals in any enclosed spaces aboard a vessel requires local exhaust ventilation or air line respirators: metals containing lead, other than as an impurity,

or metals coated with lead-bearing materials; cadmium-bearing or cadmium-coated-based metals; or metals coated with mercury-bearing metals. Cutting or heating beryllium-containing base or filler metals requires both local exhaust ventilation and air line respirators. In enclosed spaces, all surfaces covered with toxic preservatives must be stripped of all toxic coatings for at least 4 inches from the area of heat application. Otherwise, employees must be protected by air line respirators.

Employees performing any of these operations in the open air must be protected by filter-type respirators. Employees exposed to the smoke and fumes from these operations must be protected in the same manner as the employee actually doing the work.

Drums, containers, and other hollow structures that have contained flammable substances must either be filled with water or thoroughly cleaned, ventilated, and tested before they are heated or cut. Furthermore, before a hollow structure or jacketed vessel is heated, it must be vented to allow for the release of pressure. Before being heated or cut, structural voids such as skegs, bilge keels, fair waters, masts, booms, support stanchions, pipe stanchions and railings must be inspected and, if necessary, tested for the presence of flammable liquids or vapors and nonflammable liquids that could heat up and cause pressure.²⁵

E. Proposed New OSHA Standards

OSHA is considering more stringent exposure limits for chromium, nickel, and manganese fumes. These metals are common ingredients in hull steel, stainless steel, and other metals used in ship construction. Large amounts of chromium, nickel, and manganese fumes are released during torch cutting. The new limits being considered are as low as 0.5 µg/m³ and will be difficult to meet with existing cutting technology and ventilation practices.

F. Enforcement

OSHA inspectors have vast inspection and investigation authority.²⁶ If an employer refuses to allow an inspector to enter the workplace, the Solicitor of the Department of Labor may obtain a warrant in District Court. A warrant may be obtained if there is a showing akin to probable cause or if it is part of a general administrative plan for enforcement of the Act.²⁷ Unsupported allegations by an employee are not sufficient basis for a warrant.²⁸

Civil penalties between \$5,000 and \$70,000 may be imposed for willful or repeated violations. An employer who fails to correct a violation for which a citation has been issued may be assessed a civil penalty of up to \$7,000 for each day the violation continues.

A "willful violation" is not defined in the Act. It is administratively defined²⁹ as one "where the evidence shows either an intentional violation of the Act or plain indifference to its

requirements." Pursuant to OSHA policy, a repeated violation must be substantially similar to the prior violation and occur within 3 years from the date of the final order or within 3 years of the final correction date of the earlier violation, whichever is later. If the prior violation occurred in a different area office jurisdiction than the second violation, OSHA generally will not issue a citation for a repeated violation.³⁰

Criminal penalties of up to \$10,000 and 6 months imprisonment may be imposed for conviction of any violation that results in the death of an employee. For subsequent convictions, the maximum penalty is a \$20,000 fine and a year imprisonment.

Anyone convicted of giving advance notice of an OSHA inspection may be fined up to \$1,000 and imprisoned for not more than 6 months. Giving false statements is punishable by a fine of \$10,000 and 6 months imprisonment.

States have also brought criminal actions against employers who endanger the health or safety of their employees. The Occupational Safety and Health Act, however, preempts any state law or regulation that establishes an occupational health and safety standard if OSHA has already promulgated a standard, unless the state has obtained the Secretary of Labor's approval for its plan.³¹

Because of the nature of the ship breaking/recycling industry, in terms of pollutants released and potential harm to employees, it is assumed that such operations will be aggressively policed by OSHA inspectors.

G. Advanced Technology Applications to Health and Safety Issues

There are two advanced cutting technologies that could be used in ship breaking/recycling and that would reduce some occupational health and safety hazards. Laser cutters make less noise and generate lower volumes of toxic fumes than torches now in use. A laser cutter uses a laser beam, which seals the cut line as it cuts. This prevents the release of air contaminants. The FireJet[®] torch may also generate fewer toxic emissions than a conventional torch. Laser cleaning lessens the use of toxic solvents. Water jet cutters generate no airborne hazardous materials when cutting steel. Water jet cutters, however, do present additional safety issues arising from the use of water at a pressure of up to 55,000 psig.

NOTES CHAPTER 3.0

1. 29 CFR part 1910.
2. 29 CFR part 1915.
3. In addition to the rules discussed herein pertaining to hazardous substances and noise, there are many other rules regulating various practices and minimizing hazards in the workplace in general and shipyards in particular. These other rules regulate, for example: general working conditions (e.g., housekeeping, illumination, first aid); the use of scaffolds, ladders and other working surfaces; gear and equipment for rigging and materials handling; ship's machinery and piping systems; and electrical machinery.
4. The responsibility for compliance with the regulations is placed on "employers." Although owners, operators, agents and masters of vessels are not relieved of their customary duties, they are not subject to the regulations unless they are acting as employers. 29 CFR §§ 1915.3, 1915.4.
5. 29 CFR § 1910.5(c).
6. There are extensive requirements applicable to work in confined and enclosed spaces. Confined or closed spaces must be tested for oxygen content before initial entry by an employee. Spaces that have contained, or are adjacent to spaces that have contained, any of the following substances must be inspected and tested before initial entry by an employee: combustible or flammable liquids or gases; or liquids, gases, or solids that are toxic, corrosive, or an irritant. An employee may not enter a space where the oxygen content, by volume, is below 19.5 percent or above 22.0 percent, except for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space. Subject to the same exceptions, an employee may not enter a space where the atmosphere exceeds a permissible exposure limit (PEL) or is immediately dangerous to life or health (IDLH) or where the concentration of flammable vapors or gases is equal to or greater than 10 percent of the lower explosive limit. These requirements are simply illustrative.
7. 29 U.S.C. § 654.
8. *Pratt & Whitney Aircraft*, 8 OSHC 1329 (1980) vacated on other grounds, 649 F.2d 96 (2d Cir. 1981).
9. *Magma Copper Co. v. Marshall*, 608 F.2d 373 (9th Cir. 1979); *Brennan v. OSHRC*, 494 F.2d 460 (8th Cir. 1974).
10. *Kelly Springfield Tire Co. v. Donovan*, 729 F.2d 317 (5th Cir.), reh. denied, 738 F.2d 437 (5th Cir. 1984).
11. These tests and inspections are those performed to comply with 29 CFR §§ 1915.35(b)(8) and 1915.36(a)(5).
12. Section 1915.7(c) lists the following criteria:
 - (1) Ability to understand and carry out written or oral information or instructions left by Marine Chemist, Coast Guard authorized persons and Certified Industrial Hygienists;
 - (2) Knowledge of Subparts B, C, D and H of this part;
 - (3) Knowledge of the structure, location, and designation of spaces where work is done;
 - (4) Ability to calibrate and use testing equipment including, but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;
 - (5) Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in subparts B, C, D and H of this part;
 - (6) Ability to inspect, test, and evaluate spaces to determine the need for further testing by a Marine Chemist or a Certified Industrial Hygienist; and
 - (7) Ability to maintain records required by this section.
13. 29 CFR part 1915, subpart Z.

14. The regulations also contain practices and standards for other substances less likely to be encountered in ship breaking/recycling: e.g., 4-nitrobiphenyl; alpha-naphthylamine; methyl chloromethyl ether; 3,3'-dichlorobenzidene (and its salts); bis-chloromethyl ether; beta-Naphthylamine; benzidine; 4-aminodiphenyl; ethyleneimine; beta-propiolactone; 2-acetylaminofluorene; 4-dimethylaminoazobenzene; n-nitrosodimethylamine; vinyl chloride; inorganic arsenic; bloodborne pathogens; 1,2-dibromo-3-chloropropane; acrylonitrile; ethylene oxide; formaldehyde; and methylenedianiline.
15. Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated or altered.
16. OSHA found that it could achieve minimal exposure by imposing an asbestos PEL of 0.1 f/cm³ and specific worker practices. PEL levels below 0.1 f/cm³ cannot be measured accurately. Therefore, required worker practices, rather than a lower PEL, results in better protection for workers, reduces compliance burdens on employers, and eases the government's enforcement burden.
17. "Lead" means elemental lead, all inorganic lead compounds, and a class of organic lead compounds called lead soaps.
18. 29 CFR § 1915.1025.
19. 29 CFR § 1915.1027.
20. 29 CFR § 1915.1028.
21. 29 CFR §§ 1915.32 and .33.
22. 29 CFR § 1915.36.
23. 29 CFR § 1915.34.
24. 29 CFR § 1915.51. (46 CFR §§ 146.02-20 contains Coast Guard regulations pertaining to welding and cutting while explosives and dangerous cargoes are being handled).
25. 29 CFR § 1915.54.
26. 29 U.S.C. § 657.
27. *Marshall v. Barlow's, Inc.*, 436 U.S. 307 (1978).
28. *In re Kelly-Springfield Tire Co.*, 16 OSHC (BNA) 1561 (7th Cir. 1994).
29. OSHA Inspection CPL 2.45B, § IV.B.3 (1993).
30. OSHA Instruction CPL 2.45B, § IV.B.5 (1993).
31. *Gade v. National Solid Waste Management Association*, 112 S.Ct. 2374 (1992).

4.0 RULES GOVERNING THE MANAGEMENT OF OIL

A. General

Some vessels sold for recycling contain partial loads of fuel oil, lubricating oil in engine sumps, and drums of unused lubricating oil in ship storerooms or engineering spaces. Various regulations apply to the management of this oil during the voyage of a vessel to the recycling facility and during the recycling process.

The responsible party for a vessel or onshore facility from which oil is discharged is strictly liable for removal costs and damages. Under certain circumstances, a party can invoke the defense of act of God, act of war, or act or omission of a third party.

Although little can be done to eliminate statutory liability, some steps can be taken to clarify the responsibilities for management of oil before and after the ship breaking/recycling process begins. It may also be possible to use a centralized waste oil management facility that would remove oil from the ship prior to its arrival at the recycling facility.

B. Towing Rules

Before the tow, the master of the towing vessel must coordinate with the U.S. Coast Guard Captains of the Port for the departure port, destination port, and each transit port, to establish the requirements necessary to ensure the safety of both the tow and the ports.¹ All of these requirements must be contained in a towing plan.

Typical towing plans include oil spill countermeasures plans, plans to safeguard the vessel being towed, and any requirements peculiar to the vessel and its contents. Different locations may require different or additional requirements in the plan. For example, special requirements for the management of ballast water may be imposed if the vessel is being towed to the Great Lakes or up the Hudson River north of the George Washington Bridge.²

C. Vessel Recycling Rules

If more than 250 gallons of fuel oil or lubricating oil are to be removed from the vessel, the Captain of the Port must be notified and Coast Guard approval obtained. Also, the port must certify that there are adequate oil transfer facilities available. The facility must have oil spill cleanup and notification procedures and periodic inspections, and provide training.

Used oil collected from engine and equipment sumps may be a hazardous waste because of accumulated impurities, such as lead. Thus, it should be managed in accordance with applicable solid waste management rules and regulations. Used oil destined for disposal is not a "listed" waste under RCRA because existing regulations, including those describing characteristic wastes, adequately control the management of used oil.³

Oil transportation from the ship breaking/recycling facility is subject to Department of Transportation requirements concerning equipment, contingency plans, training, and record keeping.⁴ Compliance with these requirements is the responsibility of the transporter.

D. Enforcement

A civil penalty of up to \$25,000 per day may be assessed for a violation of the Oil Pollution Act or implementing regulations. In addition, the Department of Justice may obtain any relief necessary to compel compliance with the Act. This includes an injunction terminating operations.

E. Applications of Advanced Technology to Oil Management

There is no ship breaking/recycling advanced technology that would obviate the need for oil management. Advanced waste technology may be available to use waste oil and unused fuel oil to provide a heat source for advanced waste oxidation or reduction or to provide electric power. Use of the oils at the vessel recycling site would eliminate the expense and complexity of oil shipping.

NOTES CHAPTER 4.0

1. 33 CFR §§ 6.04-.08 and part 160.
2. 33 CFR §§ 151.1500 et seq.
3. EPA was upheld in its decision. *NRDC v. EPA*, 25 F.3d 1063 (D.C. Cir. 1994).
4. 49 CFR parts 130 et seq.

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5.0 RULES RELATED TO ENVIRONMENTAL CONTROL OF AIR POLLUTION

A. General

Ship breaking/recycling will generate air pollutants subject to regulation under the Clean Air Act. Asbestos, lead, and PCBs are hazardous air pollutants. Asbestos is found in pipe lagging, adhesives, tiles, gaskets, valve packing, electric cable covering, heat shields, putty, acoustic and thermal insulation, and pipe hangers. It is located in the engine room, on the boat deck, and on the main deck of older vessels. Lead is found in ballast, paint, cable coverings, gaskets, and plumbing joints. It is found throughout older ships, from the bilges to the boat deck. PCBs are found in cables, gaskets, paint, and elsewhere throughout older ships. These pollutants can be released into the air when a ship is cut up for recycling.

Other air pollutants that will be generated during ship breaking/recycling include oxides of nitrogen (NO_x) and of sulfur (SO_x), and particulate matter. Cutting torches and shoreside power plants generate NO_x and SO_x . Torch cutting, grinding, sawing, grit blasting, and other industrial processes used to cut vessels apart generate large amounts of particulate matter. Solvents used in ship breaking/recycling contain volatile organic compounds (VOCs).

Pursuant to the Clean Air Act, the EPA has promulgated National Ambient Air Quality Standards (NAAQS)¹ for ozone, nitrogen oxides, sulfur dioxide (SO_2), carbon monoxide, lead, and fine particulate matter, equal to or less than 10 microns in diameter (PM_{10}). After the promulgation or revision of an NAAQS for a given pollutant, the Air Quality Control Regions (AQCRs) are tested to determine their current status with regard to the NAAQS: attainment, nonattainment, or unclassifiable.

Areas within an AQCR with air quality better than a NAAQS are further divided into three classes as part of a program for the Prevention of Significant Deterioration (PSD) of air quality. These three classes of PSD areas are then subjected to various levels of controls to ensure that the EPA-designated "maximum allowable increases" of pollutant are not exceeded as a result of any new sources in that area.

Areas that do not meet the NAAQS for a particular pollutant are designated nonattainment areas. Pollution control measures must be prescribed by the state to bring these areas into compliance with the NAAQS.

Each state must submit to EPA a State Implementation Plan (SIP),² which contains permitting requirements and other controls the state will apply to particular sources or source categories to ensure attainment or maintenance of the NAAQS. SIPs include emission limits for classes of sources, and compliance schedules. They also include preconstruction permitting requirements for new major stationary sources, and modifications of these sources.

Stringent preconstruction permitting requirements apply to new and modified sources to be constructed in areas where an NAAQS is not being met ("nonattainment areas"). Less stringent requirements apply to areas meeting the NAAQS (PSD areas).

B. Preconstruction Permitting for Major Sources of Air Pollution

Preconstruction permitting and review are required for the construction and operation of new plants or plant modifications that are either a "major stationary source" or a "major emitting facility." A "major stationary source" is generally defined as any source that emits or has the potential to emit 100 tons or more per year of any air pollutant. A "major emitting facility" (a designation which triggers preconstruction review in PSD areas) is defined as any source from the statutory list of over two dozen types of sources that emits, or has the potential to emit, 100 tons per year or more of any air pollutant, or, any other source having the potential to emit 250 tons per year or more of any air pollutant.³

VOCs are produced through the evaporation of chemical compounds used in many common products such as solvents and cleaning fluids, which are likely to be used in ship breaking/recycling. NO_x and SO₂ will be generated by shoreside power plants. PM₁₀ will be generated by torch cutting, grinding, sawing, grit blasting and other industrial processes used to cut vessels. These emissions as well as others could cause a ship breaking/recycling facility to be either a "major stationary source" or "major emitting facility."

C. Preconstruction Permitting For Major Emitting Facilities

These sources must demonstrate that "maximum allowable increases" of a pollutant will not be exceeded. In addition, sources in these clean areas must use best available control technology (BACT) and continuous monitoring.

Hazardous air pollutants are not, as such, subject to PSD permitting. Hazardous air pollutants are subject to PSD permitting only as part of another, more general pollutant. For example, benzene, vinyl chloride, methanol, toluene, and methyl ethyl ketone are subject to PSD permitting as VOCs under the PSD regulations. Lead compounds and asbestos are still regulated as particulates under the PSD regulations. In addition, the elemental lead portion of lead compounds⁴ is a criteria air pollutant subject to the lead NAAQS and, therefore, subject to PSD permitting.

D. Preconstruction Permitting For Major Sources of Air Pollution in Nonattainment Areas

Control measures must be prescribed by the state to bring nonattainment areas into compliance with the NAAQS for any particular pollutant. This includes permit requirements prior to construction or operation of new or modified stationary sources. The SIP delineates what and

when annual incremental reductions, representing "reasonable further progress," will be attained to ensure that the NAAQS are being met.

In nonattainment areas, major new sources must achieve the lowest achievable emission rate (LAER), the most stringent emission limitation imposed. The emission increase from any new source must be offset by a previous decline in total emissions in that area so that "reasonable further progress" toward attainment of the NAAQS is maintained.

Facilities that emit VOCs are subject to greater scrutiny than other facilities in nonattainment areas. Such facilities are more likely to qualify as new or modified facilities subject to new-source review. In general, only sources with the potential to emit 100 tons per year or more of a given pollutant are defined as "major sources" and subject to new-source review; however, sources emitting as few as 5 tons of VOCs per year can be "major sources" and subject to such review, depending upon the ozone nonattainment classification of the area.

In ozone non-attainment areas, major sources of NO_x ⁵ and VOCs must use reasonably available control technology (RACT). In moderate PM_{10} nonattainment areas, sources of PM_{10} must also apply RACT. Sources of PM_{10} in serious PM_{10} nonattainment areas must employ BACT. The ratio of total VOC emission reductions to the total increased emissions from a new or modified source must now be between 1.1-1.5 to 1, based upon the area classification and whether BACT is used.

The revised SIPs for all areas designated moderate or worse are required to demonstrate a net reduction of 15 percent in total emissions of VOCs and NO_x by November 15, 1996. Therefore, additional control strategies for not only VOCs but also NO_x will probably be included in the SIPs of states with ozone nonattainment areas.

E. New Source Performance Standards

EPA has also promulgated New Source Performance Standards⁶ (NSPS) applicable to "new stationary sources." The NSPS apply to all new or modified sources for which a standard had been promulgated, and represent the "best technological system of continuous emission reduction" that has been "adequately demonstrated."

If a ship breaking/recycling facility constructed or modified a stationary gas turbine with a heat input of at least 10.7 gigajoules per hour, that turbine would have to satisfy an NSPS.⁷ The NO_x emitted by the turbine may not exceed certain levels that are based upon the nitrogen content of the fuel used. Emissions of SO_2 may not exceed 0.015 percent by volume. Fuel that contains more than 0.8 percent sulfur by weight may not be used.

If a ship breaking/recycling facility constructed or modified a steam generating unit, that unit might have to satisfy an NSPS.⁸ If the unit were smaller than 29 megawatts (MW) but greater

than 2.9 MW, it would be subject to specific limits on SO₂ and particulate emissions upon the type of fuel used. Larger steam generating units are also subject to NO_x emissions limitations.

Petroleum storage facilities at a ship breaking/recycling facility would have to satisfy an NSPS.⁹ The standard applies to storage facilities with a capacity greater than 40,000 gallons or 40 cubic meters, depending on the date of construction or modification. Older facilities may have external floating roof tanks. Some newer facilities must have either: a fixed roof and an internal floating roof, an external floating roof, a closed vent system, or a system equivalent to one of these systems.

F. National Emission Standards for Hazardous Air Pollutants

Section 112 of the Clean Air Act contains a list of 189 Hazardous Air Pollutants (HAPs).¹⁰ EPA must list all categories of major sources and area sources (i.e., sources of HAPs that are not "major sources") of each listed pollutant. A technology-based standard of maximum degree of emission reduction achievable is imposed on all new and existing major sources, and EPA promulgates standards for categories of industrial sources. This program is sometimes referred to as the "air toxics program."

The term "major source" is defined to mean any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit, considering controls and in the aggregate, 10 tons or more per year of any hazardous air pollutant or 25 tons or more per year of any combination of hazardous air pollutants.

Chromium, manganese and nickel are present in vessels being recycled. Shipboard paints contain lead and chromium compounds. There are large amounts of lead and lead alloys in permanent ballast and rotating shaft bearings. Some vessel insulation products contain fine mineral fibers. Benzene is a regulated hazardous air pollutant and is a common constituent in petroleum fuels. Asbestos is very common in thermal insulation in old vessels. Recovering or cutting these materials will cause fumes and could create the potential to emit 25 tons per year of a combination of HAPs or 10 tons per year of a single HAP.

Emissions of a particular HAP, e.g., asbestos, could well be subject to specific emission standards promulgated under § 112. For example, EPA has promulgated an asbestos standard for demolition and renovation of facilities.¹¹ Although the standard is drafted in such a way that it appears to be intended for building demolition and renovation, technically a ship is a "facility." Consequently, depending upon the type, quality, and amount of asbestos involved, this emission standard might apply to ship breaking/recycling. The asbestos emission standard applicable to asbestos waste disposal might apply as well.¹²

The centerpiece of the new air toxics program is the national standards for air toxics, which require the use of the maximum achievable control technology (MACT). EPA establishes categories of sources that are the primary emitters of the 189 hazardous air pollutants listed under

§ 112(b). Over a period of 10 years following the 1990 Amendments, EPA must establish nationally applicable standards for these categories. As "applicable requirements" under 40 CFR part 70, the MACT standards must be incorporated into the Title V permit.

G. Operating Permit Program

Operating permits for air pollution control are a new EPA program. Although most states have had operating permit programs for at least 10 years, the states may not be able simply to use these existing programs to comply with EPA's new program. Thus, many of the details as to how the operating permit program will work remain to be seen.

Operating permits will include all of a facility's Clean Air Act requirements. These permits are patterned after the National Pollutant Discharge Elimination System (NPDES) permits required under the Clean Water Act. This may be an elusive goal. Typically, there are considerably more sources of air pollution than there are point sources of water pollution at a facility.

Sources requiring operating permits include major sources, sources subject to standards under § 111 or 112 of the Act, and affected sources under the acid rain requirements of Title IV. If a ship breaking/recycling facility were a major source or subject to the NSPS or to a standard under § 112 dealing with HAPs, an operating permit would be required.

The major provisions of the Clean Air Act — particularly the NAAQS program, the NSPS, and the air toxics programs — are enforced through operating permits, which will contain all emissions requirements. These programs will be administered by the states after they have been approved by EPA. EPA retains veto power over every operating permit.

The states may exempt temporarily nonmajor sources from the operating permit program. There are different thresholds for determining whether a source is a "major source" and, thus, not exempt. Which threshold applies depends on whether the source emits air pollutants generally, hazardous air pollutants, or "criteria" air pollutants in areas designated nonattainment for those pollutants.

The term "stationary source" means any building, structure, facility, or installation which emits or may emit any air pollutant. In general, a "major stationary source" means any stationary source that emits or has the potential to emit 100 tons per year or more of any air pollutant. If, however, a source is located in a nonattainment area, the threshold for a major stationary source is 25 tons per year of VOCs in severe areas and 10 tons per year of VOCs in extreme areas.

Section 112 of the Act includes a list of chemicals, compounds, or groups of chemicals deemed by Congress to be HAPs. For purposes of hazardous air pollutants, the term "major source" is defined to mean any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit, considering controls and in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or

more of any combination of hazardous air pollutants. EPA may establish a lesser quantity of pollutant emissions for the definition of a major source based on characteristics of the pollutants being emitted, including potency, persistence, and the potential for bioaccumulation.

Applications must be filed within 12 months from when a source becomes subject to the program, unless the state has established an earlier date. In theory, permitting authorities must act on applications within 18 months.¹³

Applications must contain a description of the source's processes and products, as well as certain emissions-related information and air pollution control information. Each application also must include a compliance plan and schedule. The compliance plan is not binding on the source, but the schedule is. Ultimately, the schedule of compliance is incorporated into the permit.

If the source is already in compliance with the Clean Air Act, the plan and schedule of compliance are virtually a formality. If a source is not in compliance with an applicable requirement, the schedule of compliance must include an enforceable schedule of actions and milestones, along with a schedule for submission of progress reports at least every 6 months.

Activities approved by EPA as "insignificant" may in some cases be omitted from the application altogether or treated in summary form. Any activities needed to determine the applicability of Clean Air Act requirements or the amount of fees due are not subject to these exemptions.

The purpose of the operating permit program is to achieve compliance with all "applicable requirements." If a permit does not ensure compliance with an applicable requirement, EPA must object to issuance of the permit.

The operating permits may allow some operational flexibility through permitting the "worst case," permitting by classes of chemicals, and permitting in the alternative. The "off-permit" provisions in the regulations allow changes not "addressed or prohibited" by the permit to take place without a permit revision. The source must provide contemporaneous notice of these changes to the state permitting authority and EPA. The source must keep a record of these changes at the facility. Thus, a ship breaking/recycling facility might not need a formal permit revision to emit a pollutant not even mentioned in its permit.

The operating permits rule allows some emissions trading within a facility. The permitting authority must allow emissions trading among emissions units at a facility, solely for the purpose of complying with a federally enforceable emissions limit accepted by a facility to limit the "potential to emit" and the applicability of the Act.¹⁴ Individual units within the facility could exceed individual emissions limitations so long as the emissions limitations for the entire facility were not exceeded.

H. Enforcement

Criminal penalties may be imposed under the Act for "knowing" violations. The penalties include up to 5 years imprisonment for a first offense and 10 years for subsequent convictions.

Civil penalties of up to \$25,000 per day per violation may be imposed and injunctive relief sought against "owner or operator" or any other person. There is a statutory presumption that the violation continues to occur "each and every day" after the date of notice of violation. District Courts have jurisdiction to enforce standards or apply civil penalties through citizen suits.

EPA may assess administrative penalties not in excess of \$200,000 simply by issuing an order. EPA may assess on-the-spot civil penalties of up to \$5,000 per day for "minor violations" without a prior administrative order or civil action.

I. Applications of Advanced Technology to Air Quality Issues

New technology may well reduce air emissions from ship breaking/recycling. Lasers, water-jets, and even explosive tape and shears may produce fewer emissions from ship cutting than conventional torches. To the extent that cold cutting, e.g., water jet cutting, is used, fumes from heated metals will be reduced. The FireJet® Torch produces fewer emissions than conventional torches. Underwater cutting would substantially reduce air emissions; however, occupational safety concerns may make it impractical.

NOTES CHAPTER 5.0

1. Standards may be found at 40 CFR part 50 et seq. Primary standards are designed to protect public health with an adequate margin of safety. Secondary standards are designed to prevent any known or anticipated adverse effects of an air pollutant on public welfare.
2. 40 CFR part 52.
3. These listed facilities are: fossil-fuel fired steam electric plants of more than 250 million British thermal units per hour heat input; coal cleaning plants (thermal dryers); kraft pulp mills; Portland cement plants; primary zinc smelters; iron and steel mill plants; primary aluminum ore reduction plants; primary copper smelters; municipal incinerators capable of charging more than fifty tons of refuse per day; hydrofluoric, sulfuric, and nitric acid plants; petroleum refineries; lime plants; phosphate rock processing plants; coke oven batteries; sulfur recovery plants; carbon black plants (furnace process); primary lead smelters; fuel conversion plants; sintering plants; secondary metal production facilities; chemical process plants; fossil-fuel boilers of more than 250 million British thermal units per hour heat input; petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels; taconite ore processing facilities; glass fiber processing plants; charcoal production facilities. 42 U.S.C. §7479.
4. 40 CFR part 60, appendix A, method 12.
5. There are exceptions for NO_x if the administrator determines that NO_x reductions would not benefit air quality.
6. 40 CFR part 60.
7. 40 CFR part 60, subpart GG.
8. 40 CFR part 60, subparts Db and Dc. Subpart Db applies to generating units that are larger than 29 MW and subpart Dc applies to those that are 29 MW or less but at least 2.9 MW.
9. 40 CFR part 60, subparts K-Kb.
10. 40 CFR part 61.
11. 40 CFR § 61.145.
12. 40 CFR § 61.150.
13. The state may take up to 3 years to issue permits to sources submitting applications during the first year, but it must act on one-third of such applications annually during the first 3 years.
14. This provision is not intended to override state new source review programs, and discretion to determine the adequacy of a particular trading proposal is left to the state. Consequently, this provision is something less than a total approval of emissions trading designed to avoid review under the Clean Air Act.

6.0 RULES RELATED TO ENVIRONMENTAL CONTROLS OF WATER POLLUTION

A. General

Ship breaking/recycling facilities routinely handle process water, harbor water, and rainwater that accumulates in the bilges of ships. Typically, this water contains oily residues, metals, chemicals used in ship cutting, and other shipboard contaminants. The discharge of any of these waste waters into either the waters of the United States or publicly owned treatment works (POTWs) is regulated under the Clean Water Act.

Aside from bilge water and other waste water, rainwater runoff from a ship breaking/recycling facility will probably require a permit. Scrapyards and salvage yards must obtain a storm water runoff permit regardless of whether the storm water has come into contact with any equipment or material.

The regulations issued pursuant to the Clean Water Act establish limits¹ on the pollution that can be discharged by direct dischargers, including POTWs, and indirect dischargers. Direct dischargers are regulated through a National Pollutant Discharge Elimination System (NPDES) permit under § 402 of the Act.² A permit is required for all point sources³ of pollutants, including storm water runoff, discharged to virtually any body of surface water. Permits are also required under § 404 for the discharge of dredged and fill material.

B. Direct Dischargers

A ship breaking/recycling facility that discharges pollutants from a point source into surface water will require an NPDES permit. An NPDES permit contains a variety of standard, boilerplate conditions that vary little from one permit to the next. These include requirements that the permittee mitigate violations that would adversely affect human health or the environment, properly operate and maintain the treatment system, allow EPA representatives to enter and inspect the facility, conduct proper monitoring, maintain records, and submit reports to EPA.

NPDES permits also contain conditions that are specific to the type of point source being permitted.⁴ EPA has established a number of different kinds of technology-based effluent limitations guidelines and new source performance standards⁵ and a complex apparatus to enforce rigid maximum effluent limitations on point sources. The NPDES permit process converts these effluent limitations and related standards into obligations enforceable against pollutant dischargers. Lest any pollutant of concern avoid the reach of EPA's industry-wide standards, permit writers are authorized to set discharge limits based on best professional judgment.⁶

New Source Performance Standards (NSPS) are based on best available demonstrated technology. New sources⁷ have the opportunity to install the best and most efficient production processes and waste water treatment technologies. In establishing NSPS, EPA considers the best demonstrated process changes, in-plant controls, and end-of-process control and treatment technologies that reduce pollution to the maximum extent feasible. EPA is also required to consider the cost of achieving the effluent reduction and any nonwater quality environmental impacts and energy requirements.

Existing industrial sources discharging conventional pollutants must use the "best conventional pollutant control technology (BCT). Conventional pollutants are biochemical oxygen demanding pollutants, total suspended solids, fecal coliform, pH, oil, and grease.

BCT must be "cost reasonable."⁸ The cost to private industry of reducing its conventional pollutants must not be unreasonable when compared with the cost to POTWs of achieving similar reductions of these pollutants. Moreover, the additional industrial treatment that BCT would require beyond the best practicable control technology currently available (BPT),⁹ a standard that had to have been met by July 1, 1977, must be cost-effective.

Existing industrial sources discharging toxic and nonconventional pollutants must use the best available technology (BAT).¹⁰ BAT is based on the age of the equipment and facilities involved, the process employed, the engineering aspects of the control technologies, process changes, the costs and economic impact of achieving such effluent reduction, and environmental impacts other than impacts on water quality. EPA has considerable discretion in assigning the weight given these factors. EPA has prescribed best management practices to prevent the release of toxic and hazardous pollutants from plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage associated with the manufacturing or treatment process.

C. Indirect Dischargers

A ship breaking/recycling facility that discharges pollutants into a POTW rather than directly into surface water will not need a permit but will be an indirect discharger and subject to pretreatment standards.¹¹ EPA has promulgated two types of pretreatment standards: general pretreatment standards, and categorical standards.

General standards¹² prohibit the release of any pollutants by any nondomestic source if those pollutants interfere with or pass through a POTW.¹³ In addition, the general standards contain a number of specific prohibitions. For example, discharges with a pH lower than 5.0 are prohibited. No discharges are allowed that may cause toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems. Petroleum oil, nonbiodegradable cutting oil, or mineral oil products in amounts that will cause interference or pass through may not be discharged into a POTW. Trucked and hauled waste may be discharged only at specific points designated by POTWs.¹⁴ The general standards also allow POTWs to establish their own local rules, which are enforceable to the same extent as the federal standards

if they are more stringent than federal standards. These regulations¹⁵ also require noncategorical users to file semiannual reports if they are "significant industrial users."¹⁶

Industrial users must notify the POTW, EPA and state hazardous waste authorities of discharges of RCRA hazardous waste. Industrial users discharging more than 100 kilograms of hazardous waste per month must comply with additional notification requirements. Industrial users discharging hazardous waste must certify that they have a program to reduce the volume and toxicity of wastes being generated.¹⁷

The categorical standards establish numerical limits on the discharge for specific categories¹⁸ of industrial sources of particular toxic pollutants that could interfere with or pass through¹⁹ POTWs. An indirect discharger has an obligation to meet a categorical standard²⁰ that is independent of the obligation of the POTW into which it discharges.²¹

The regulations also establish elaborate reporting requirements for industries subject to these standards. A baseline monitoring report must be filed by indirect dischargers within 180 days after the effective date of the categorical pretreatment standard or within 180 days after a final decision on a category determination request, whichever is later. It must contain an identification of the indirect discharger, a description of its operations, a report on the flows of regulated streams and the results of sampling analyses to determine levels of regulated pollutants in those streams, a statement of the discharger's compliance or noncompliance with the standard, and a description of any additional steps required to achieve compliance.

A report on compliance is required of each indirect discharger within 90 days following the date for compliance with an applicable categorical pretreatment standard. The report must include the nature and concentration of all regulated pollutants in the facility's process waste streams, the average and maximum daily flows of the regulated streams, and whether the facility is consistently in compliance with the Act.

A semiannual compliance report on continuing compliance with all applicable categorical pretreatment standards must be filed. It must show the nature and concentrations of the regulated pollutants discharged to the POTW, the average and maximum daily flow rates, the methods used to sample and analyze the data, and certification that these methods of sampling and analysis satisfy the regulations.

D. Storm Water Runoff

A ship breaking/recycling facility, as a discharger of storm water²² associated with industrial activity, must apply for an individual permit,²³ apply for a permit through a group application, or seek coverage under a promulgated storm water general permit.²⁴ The term "storm water discharge associated with industrial activity"²⁵ means "the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant." Facilities involved in the

recycling of materials — including metal scrapyards and salvage yards — are specifically listed²⁶ as facilities engaging in industrial activity. The material, equipment, and machinery at such a recycling facility need not have been exposed to storm water in order to trigger the need for a permit.

The term "storm water discharge associated with industrial activity" does not include discharges from facilities or activities excluded from the NPDES program.²⁷ Thus, effluent from properly functioning marine engines and any other discharge incidental to the normal operation of a vessel do not require permits.

The operator of a storm water discharge associated with industrial activity must submit a permit application²⁸ that contains: a site map showing topography or the outline of drainage areas of the facility;²⁹ an estimate of the area of impervious surfaces and the total area drained by each outfall within a mile of the facility; and significant materials³⁰ that in the 3 years prior to submittal of the application have been exposed to storm water. With regard to these materials the applicant must describe: the method of treatment, storage or disposal of such materials; materials management practices employed in the 3 years prior to the submittal of the application to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner and frequency in which pesticides, herbicides, soil conditioners and fertilizers are applied.

The application must also contain: the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; a description of the treatment the storm water receives, including the ultimate disposal of any solid or fluid wastes other than by discharge; certification that all outfalls that should contain storm water discharges associated with industrial activity have been tested or evaluated for the presence of non-storm water discharges which are not covered by an NPDES permit; and significant leaks or spills of toxic or hazardous pollutants at the facility within 3 years prior to the submittal of the application.

Quantitative data³¹ based on samples of storm water runoff must also be included. These data must show: any pollutant limited in an effluent guideline to which the facility is subject; if the facility has an NPDES permit, any pollutant listed in that permit for the facility's process wastewater; oil and grease, pH, BOD₅, COD, total suspended solids, total phosphorus, total Kjeldahl nitrogen, and nitrate plus nitrite nitrogen; and flow measurements or estimates of the flow rates for the storms sampled, along with dates, duration, total discharge, total rainfall, and length of time from the previous measurable storm.

E. Discharge of Dredged and Fill Material

Pursuant to § 404 of the Clean Water Act,³² the Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States, which include adjacent wetlands.³³ There are individual and nationwide permits.

Nationwide permits are approved categories of activities listed in the regulations.³⁴ The Corps does have the discretion not to allow an activity to proceed under a nationwide permit. Nationwide permits do contain general conditions — e.g., notification requirements for certain discharges — as well as permit specific conditions.

The individual permit process requires an elaborate balancing by the Corps of the factors that the regulations list as comprising the public interest. These factors include conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife, floodplain values, flood hazards, land use, navigation, shore erosion and accretion, recreational water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, property ownership, and the needs and welfare of the people.³⁵

Although the Corps issues or denies the permits, EPA plays an important role. The permit will be denied if it does not satisfy EPA's § 404(b)(1) guidelines.³⁶ EPA may veto a Corps permit action if the discharge would have an unacceptable effect on municipal water supplies, shellfish, fishing areas, wildlife, or recreation area.³⁷

The 404(b)(1) guidelines provide that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem."³⁸ There is a presumption against permit issuance for non-water dependent projects unless there are no practicable alternatives that are less environmentally damaging. It would seem reasonable that a ship breaking/recycling facility would be water dependent.

Certification that the discharge will not violate applicable water quality standards must be obtained from the state or interstate agency having jurisdiction over the waters at the point of discharge. Obtaining this certification can be an arduous task if the state has defined its waters to include wetlands that would be affected by the discharge or if the state has adopted standards more stringent than the minimum standards required under the Clean Water Act.

Certification of consistency with the state's coastal zone management plan may also be required for work in the coastal zone. The impacts considered in coastal zone management programs have been expanded to include historic values impacts on areas likely to be affected or vulnerable to sea-level rise.³⁹

F. Enforcement

The Clean Water Act contains civil and criminal penalties and administrative and judicial enforcement procedures. The criminal penalties, however, deserve special attention for two reasons. First, most environmental criminal actions are brought either under the Resource Conservation and Recovery Act (RCRA) or the Clean Water Act. Second, it is now much easier for the government to obtain a conviction under the Clean Water Act than it was before United States v. Weitzenhoff.⁴⁰

In Weitzenhoff, two sewage treatment plant managers were found guilty for knowingly violating the Clean Water Act. The court held that it was not necessary for the government to prove that they knew they had violated the NPDES permit or the Act, but only that they knew they were discharging materials. Therefore, facility owners may be subject to criminal penalties for "knowing" violations of the Clean Water Act without knowing that they are breaking the law.

G. Application of Advanced Technology to Water Quality

Technologies such as laser cleaning that do not require the use of toxic solvents and that reduce overall emissions — e.g., laser cutting, FireJet® torch — could facilitate compliance with the Clean Water Act.

NOTES CHAPTER 6.0

1. Section 301(a) of the Clean Water Act, 33 U.S.C. § 1311(a), prohibits the discharge of pollutants into waters of the United States, except as provided in §§ 301, 302, 306, 307, 318, 402, and 404 of the Act.
2. 33 U.S.C. § 1342
3. A point source is defined in the Act to be "any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. . . ." 33 U.S.C. § 1362(14). This has been found to embrace "the broadest possible definition of any identifiable conveyance from which pollutants might enter the waters of the United States." *United States v. Earth Sciences, Inc.*, 599 F.2d 368 (10th Cir. 1979).
4. EPA has interpreted its regulations at 40 CFR § 122.4(d) as prohibiting issuance of an NPDES permit "when the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected states." This interpretation was viewed approvingly by the Supreme Court when it held that EPA had properly issued an NPDES permit to a sewage treatment plant in Arkansas and required permit conditions to protect the water quality of all affected states. *Arkansas v. Oklahoma*, 112 S. Ct. 1046 (1992).
5. NSPS have been promulgated for: nonferrous-metal forming and metal powders; pharmaceutical manufacturing; ore mining and dressing; battery manufacturing; plastics molding and forming; metal molding and casting; coil coating; porcelain enameling; aluminum forming; copper forming; electrical and electronic components; pulp, paper, and paperboard; builders' paper and board mills; metal finishing; iron and steel manufacturing; nonferrous metal manufacturing; steam electric power generating; leather tanning; timber products; textile mills; petroleum refining; and inorganic chemical manufacturing.
6. U.S.C. § 1342(a)(1).
7. 40 CFR § 122.2 defines "new source" as any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which is commenced: after promulgation of standards of performance applicable to that source; or after proposal of standards of performance applicable to that source if the standards are promulgated within 120 days of proposal. 40 CFR § 122.29(b)(4) further provides that "construction" of a new source has commenced if the owner or operator has, as part of a continuous on-site construction program, begun any placement assembly or installation of facilities or equipment, begun significant site preparation work; entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time.
8. *American Paper Institute v. EPA*, 660 F.2d 954 (4th Cir. 1981).
9. BPT was based on the average of the best existing performance by plants of various sizes, ages, and unit processes within the category or subcategory. In establishing BPT limitations, EPA considered the total cost in relation to the age of equipment and facilities involved, the processes employed, process changes required, engineering aspects of the control technologies, and nonwater quality environmental impacts (including energy requirements). The total cost of applying the technology was balanced against the effluent reduction.
10. Notwithstanding the use of BAT, there remain numerous bodies of water that contain high levels of toxic contaminants. Consequently, states have been required to submit to EPA lists of water bodies that do not meet water quality standards due to point source discharges of toxic pollutants and to propose an individual control strategy for each such point source. The states are also required to submit a list of waters that do not meet water quality standards due to any source of toxic pollutants, point source or otherwise, and a list of waters that do not meet the goals of the Act due to the presence of any pollutant. The states have been required to identify sources of pollution contributing to the problems identified on the latter two lists as well. See *NRDC v. EPA*, 915 F.2d 1314 (9th Cir. 1990).
11. EPA is directed to promulgate pretreatment standards "to prevent the discharge of any pollutant through Publicly Owned Treatment Works, which pollutant interferes with, passes through or otherwise is incompatible with such works." 33 U.S.C. § 1317(b)(1). Citizens suits may be brought to enforce these standards. 33 U.S.C. § 1365(a)(1)(A), (f)(4).
12. 40 CFR part 403.

13. The regulations provide an affirmative defense to "pass through" or "interference" if an industrial user can demonstrate that: it did not know or have reason to know that its discharge, alone or in conjunction with discharges from other sources, would cause pass through or cause interference, and the discharge was in compliance with any local limits designed to prevent pass through or interference or, if there were no local limits, the discharge did not substantially differ from the user's discharges during periods when the POTW was in compliance with its permit and sludge requirements.
14. 40 CFR § 403.5.
15. 40 CFR § 403.12(h).
16. Significant industrial users are those: (a) that are subject to a categorical pretreatment standard; (b) that discharge an average of more than 25,000 gallons per day of processed wastewater; (c) that contribute 5 percent or more of the average capacity of the POTW; or, (d) that otherwise have a reasonable potential to affect adversely the POTW's operation. 40 CFR § 403.3(t)(1).
17. 40 CFR § 403.12(p).
18. The categories are: nonferrous-metal forming and metal powders; pharmaceutical manufacturing; battery manufacturing; plastics molding and forming; metal molding and casting; coil coating; porcelain enameling; aluminum forming; copper forming; electrical and electronic components; pulp, paper, and paperboard; builders' paper and board mills; metal finishing; iron and steel manufacturing; nonferrous metal manufacturing; steam electric power generating; leather tanning; timber products; textile mills; electroplating; petroleum refining; and inorganic chemical manufacturing.
19. A bypass that does not result in a violation of the pretreatment standards is permissible if it is for essential maintenance to ensure efficient operation. A bypass that does cause a violation of pretreatment standards may be allowed if it was necessary to prevent loss of life, personal injury, or severe property damage; if there were no feasible alternatives; and if the industrial user submitted the required notice. 40 CFR § 403.17.
20. An "upset" defense may be available for violations of categorical pretreatment standards. An "upset" is "an exceptional incident in which there is unintentional and temporary noncompliance with categorical pretreatment standards because of factors beyond the reasonable control of the industrial user." 40 CFR § 403.16(a). In *Sierra Club v. Union Oil Co.*, 813 F.2d 1480 (9th Cir. 1987), the court held that Union Oil could not invoke this defense because a state may impose standards more stringent than the federal standards and, in this case, the state had issued a permit that did not contain an "upset" provision. The court also noted that this particular defense is available only with respect to technology-based standards, not as a defense to water-quality-based permit violations.
21. *Atlantic States Legal Foundation v. Karg Brothers*, 841 F. Supp. 51 (NDNY 1993).
22. "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR § 122.26(b)(13).
23. A single NPDES permit may be issued for storm water discharges associated with industrial activity from point sources that discharge through a non-municipal or non-publicly owned separate storm sewer system. Each discharger must be a co-permittee to a permit issued to the operator of the portion of the system that discharges into "waters of the United States."
24. Instead of an individual application, a group application may be filed by an entity representing a group of applicants (except facilities that have existing individual NPDES permits for storm water) that are part of the same subcategory (see 40 CFR parts 405-471). A general permit under 40 CFR § 122.28 may also be available. Facilities with existing NPDES permits for storm water discharges associated with industrial activity, however, must maintain existing permits.
25. 40 CFR § 122.26(b)(14). The term specifically includes: storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters; sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas, including tank farms, for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water.

26. 40 CFR § 122.26(b)(14)(vi).
27. For exclusions from NPDES permit requirements, see 40 CFR § 122.3.
28. 40 CFR § 122.26(c).
29. This includes each of its drainage and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall; each past or present area used for outdoor storage or disposal of significant materials; each existing structural control measure to reduce pollutants in storm water runoff; materials loading and access areas; areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal facilities; each well where fluids from the facility are injected underground; springs; and other surface water bodies that receive storm water discharges from the facility.
30. The term "significant materials" includes: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under § 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); any chemical the facility is required to report pursuant to § 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA); fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges. 40 CFR § 122.26(b)(12).
31. Operators of new sources or new discharges that are composed in part or entirely of storm water may include estimates for these pollutants instead of actual sampling data but must submit quantitative data within 2 years after commencement of discharge, unless such data have already been reported under the monitoring requirements of the NPDES permit for the discharge. Moreover, under the regulations, operators of a discharge that is composed entirely of storm water are exempt from some of these requirements. It does seem anomalous for such a discharge to require a permit at all. See *United States v. Plaza Health Laboratories, Inc.*, 3 F.3d 643 (2d Cir. 1993), cert. denied sub. nom. *United States v. Villegas*, 114 S. Ct. 2764 (1994); *National Wildlife Federation v. Consumers Power Co.*, 862 F.2d 580 (6th Cir. 1988).
32. 33 U.S.C. § 1344.
33. Federal agencies are required to avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to such construction; and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. In making these findings the head of the agency may take into account economic, environmental and other pertinent factors. Exec. Order Nos. 11,990 (1977), as amended in Exec. Order No. 12,608 (1987). See also, Exec. Order No. 11,988 (1977), as amended by Exec. Order No. 12,148 (1979) (similar regulation governing floodplains). An agency may make these findings, conditioned upon the development of mitigation measures. *County of Bergen v. Dole*, 620 F. Supp. 1009 (D.N.J. 1985), aff'd, 800 F.2d 1130 (3d Cir. 1986).
34. 33 CFR part 330.
35. 33 CFR § 320.4
36. 40 CFR part 230.
37. In exercising its veto power, EPA is not always required to consider the needs of the public in the face of unacceptable adverse effects on the environment. See *James City County v. EPA*, 12 F.3d 1330 (4th Cir. 1993), cert. denied, 115 S. Ct. 87 (1994).
38. 40 CFR § 230.10(a).
39. 59 Fed. Reg. 27,974 (1994).
40. 35 F.3d 1275 (9th Cir. 1993).