This document includes the front material, including Forward, Contents, andExecutive Summary
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Phase I Final Rule and Technical Development Document of Uniform National Discharge Standards (UNDS)

Foreward, Contents, Executive Summary

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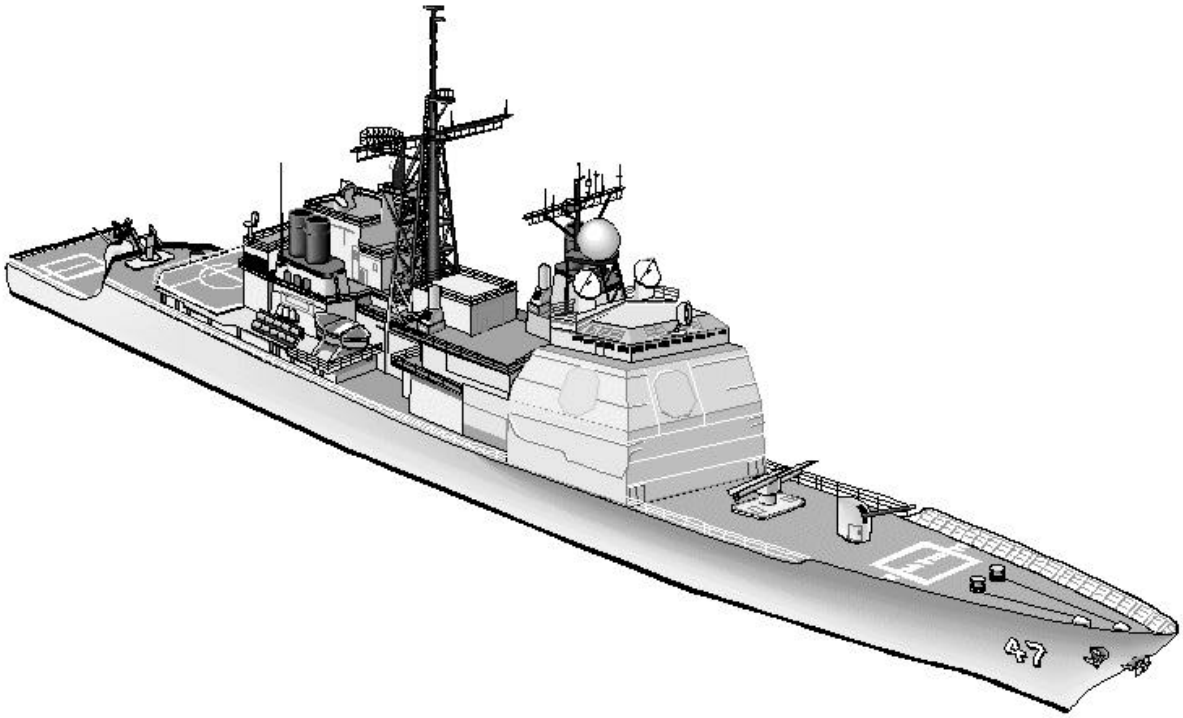
PHASE I
UNIFORM NATIONAL DISCHARGE STANDARDS FOR VESSELS OF THE ARMED FORCES

TECHNICAL DEVELOPMENT DOCUMENT



Technical Development Document

for

Phase I Uniform National Discharge Standards

for

Vessels of the Armed Forces

Naval Sea Systems Command
U.S. Department of the Navy
Arlington, VA 22202

and

Engineering and Analysis Division
Office of Science and Technology
Office of Water
U.S. Environmental Protection Agency
Washington, DC 20460

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FOREWORD

This Technical Development Document was produced jointly by the Naval Sea Systems Command of the United States Navy and the Office of Water of the United States Environmental Protection Agency. The purpose of this document is to provide, in part, the technical background that was used to develop the Phase I regulation that is issued under authority of the Uniform National Discharge Standards provisions of the Clean Water Act, 33 U.S.C., 1322(n).

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EXECUTIVE SUMMARY

This Technical Development Document provides the technical background for the Phase I regulation that is issued under authority of the Uniform National Discharge Standards (UNDS) provisions of the Clean Water Act (CWA). The purpose of Phase I of UNDS is to determine those discharges that are incidental to the normal operation of Armed Forces vessels for which it is reasonable and practicable to require the use of a marine pollution control device (MPCD) on at least one vessel class, type, age, or size. An extensive data collection effort was conducted to identify vessels of the Armed Forces producing discharges incidental to normal operations and to characterize those discharges. Initial requests for information were made to each branch of the Armed Forces to obtain discharge information and to help compile a list of vessels that could be subject to UNDS requirements. EPA and DoD identified a list of 39 types of discharges incidental to the normal operations of vessels of the Armed Forces and evaluated them during Phase I of UNDS. Consultations with personnel having equipment expertise were held on each discharge to identify available data and data gaps. Sampling data were collected from various vessels, where needed, to supplement existing data. Concurrently, existing laws and regulations were reviewed, including applicable international, Federal, State, and local standards. In addition, consultation meetings were held with interested Federal agencies, States, and environmental organizations.

The information collected from surveys, consultations, and discharge sampling and analysis was used collectively to evaluate the 39 types of discharges. Phase I decisions were made on these discharges according to the seven factors required to be considered by § 312(n)(2)(B) of the CWA:

- the nature of the discharge;
- the environmental effects of the discharge;
- the practicability of using a MPCD;
- the effect that installing or using the MPCD has on the operation or the operational capability of the vessel;
- applicable United States law;
- applicable international standards; and
- the economic costs of installing and using the MPCD.

The Administrator of the Environmental Protection Agency ("Administrator") and the Secretary of Defense ("Secretary") have determined that it is reasonable and practicable to require MPCDs on at least one vessel class, type, age, or size for 25 of the 39 discharges to mitigate adverse impacts or the potential for adverse impacts on the marine environment. These discharges are listed in Table ES-1 along with a brief description of each. For these 25 discharges, assessments of the practicability, operational impact, cost, and environmental effectiveness of potentially available MPCDs were conducted. The Administrator and the Secretary also have determined that it is not reasonable and practicable to require MPCDs for the remaining 14 discharges because these discharges exhibit a low potential to cause adverse

impacts to the marine environment. These discharges are listed and briefly described in Table ES-2.

Table ES-1. Discharges Determined To Require MPCDs

Discharge	Description
Aqueous Film-Forming Foam	The primary fire-fighting agent used for flammable liquid fires on vessels of the Armed Forces. It is a concentrated liquid that is mixed with seawater to form a 3% to 6% solution which is discharged during planned maintenance, testing, system inspections, and flight deck certifications.
Catapult Water Brake Tank and Post-Launch Retraction Exhaust	Discharge from the water brake and from retracting catapults on aircraft carriers during aircraft launching operations and testing. Lubricating oil that is applied to the catapult cylinder collects in the water brake tank during these operations and is eventually discharged overboard. Also, expended steam and residual oil are released overboard when the catapult is retracted between launchings and testings.
Chain Locker Effluent	Seawater and debris that collects in the anchor chain storage locker as a result of anchor chain washdowns, retrievals, and heavy weather. The liquid collects in a sump and is removed by a drainage eductor powered by the shipboard firemain.
Clean Ballast	Either seawater or freshwater that is transferred into and out of dedicated tanks to adjust a surface ship's draft and to improve stability under various operating conditions. On submarines, seawater taken aboard into the main ballast system to control buoyancy and into the variable ballast system to control trim, list, and to adjust buoyancy. The discharge is generated when the ballast is no longer required and the tanks are partially or completely emptied.
Compensated Fuel Ballast	Seawater that is introduced into fuel tanks to maintain the stability of a vessel by compensating for the weight of the expended fuel that is consumed. During refueling, this seawater is displaced overboard.
Controllable Pitch Propeller Hydraulic Fluid	Hydraulic oil that is released from controllable pitch propeller (CPP) systems under three conditions: leakage through CPP seals, releases during underwater CPP repair and maintenance, or releases from equipment used for CPP blade replacement.
Deck Runoff	Water runoff from precipitation, freshwater washdowns, and seawater that falls on the exposed decks of a vessel such as a weather deck or flight deck. This water washes off residues from the deck and topside equipment, can be contaminated with materials from other deck activities, and is discharged overboard to receiving waters.
Dirty Ballast	Seawater that is occasionally pumped into empty fuel tanks for the specific purpose of improving ship stability. Before taking on seawater, fuel in the tank to be ballasted is transferred to another fuel tank or holding tank. Dirty ballast is comprised of residual fuel mixed with seawater. The discharge is generated when the ballast is no longer required and the tanks are partially or completely emptied.
Distillation and Reverse Osmosis Brine	Seawater concentrate or "brine" that is left over by water purification systems that generate freshwater from seawater for a variety of shipboard applications including potable water for drinking. This "brine" is discharged overboard.
Elevator Pit Effluent	Liquid from deck runoff and elevator equipment maintenance activities that collects in the bottom of elevator shafts. The liquid waste is either directed overboard, collected for shore-side disposal, or processed along with bilgewater.
Firemain Systems	Seawater distributed for fire fighting and other services aboard ships. Discharges of firemain water from normal operations occur during firemain testing, maintenance and training activities, anchor chain washdown, and cooling of auxiliary machinery.
Gas Turbine Water Wash	Wash water discharge from cleaning internal and external propulsion and auxiliary gas turbine components.

Table ES-1. Discharges Determined To Require MPCDs (contd.)

Discharge	Description
Graywater	Wastewater from showers, galleys, laundries, deck drains, lavatories, interior deck drains, water fountains, miscellaneous shop sinks, and similar sources.
Hull Coating Leachate	Antifouling agents that leach into surrounding waters from hull coatings designed to prevent corrosion and to inhibit biological growth on the hull surface.
Motor Gasoline Compensating Discharge	Seawater used to compensate for expended motor gasoline (MOGAS) used to operate equipment stored on some Navy vessels. MOGAS is stored in a compensating tank system to which seawater is added to fuel tanks as fuel is consumed. The discharge occurs as a result of refueling when the displaced water is discharged overboard.
Non-Oily Machinery Wastewater	Generated from the operation of distilling plants, water chillers, low- and high-pressure air compressors, and propulsion engine jacket coolers. The discharge is captured in a dedicated system of drip pans, funnels, and deck drains to segregate the water from bilgewater, and is either drained directly overboard or into dedicated collection tanks before being discharged overboard.
Photographic Laboratory Drains	Shipboard photographic lab wastes from processing color and black-and-white film. Typical wastes include spent film processing chemical developers, fixer-bath solutions, and film rinse water.
Seawater Cooling Overboard Discharge	Seawater used to cool heat exchangers, propulsion plants, and mechanical auxiliary systems.
Seawater Piping Biofouling Prevention	Anti-fouling compounds such as sodium hypochlorite introduced in seawater cooling systems to inhibit the growth of fouling organisms on interior piping and component surfaces.
Small Boat Engine Wet Exhaust	Seawater injected into the exhaust of small boat engines for cooling and to quiet operation. Exhaust gas constituents are entrained in the injected seawater and discharged overboard as wet exhaust.
Sonar Dome Discharge	Some domes that house detection, navigation, and ranging equipment are filled with freshwater and/or seawater to maintain their shape and pressure. The discharge occurs when water from inside the dome is pumped overboard before performing maintenance or repair on the dome and when materials leach from the dome exterior.
Submarine Bilgewater	Sources of bilgewater include seawater accumulation, normal leakage from machinery, and fresh water washdowns that collect in the bilge. On some submarines, oily wastewater is separated from non-oily wastewater. The oily wastewater is held for shore-side disposal and the non-oily wastewater is discharged overboard.
Surface Vessel Bilgewater/Oil-Water Separator Discharge	Sources include condensate from steam systems, boiler blowdowns, water fountains, and machinery space sinks that drain to the bilge. Bilgewater is either held for shore-side disposal or treated in an oil-water separator before being discharged overboard.
Underwater Ship Husbandry	Discharge from the grooming, maintenance, and repair of hulls and hull appendages performed while a vessel is waterborne. Underwater ship husbandry includes hull cleaning, fiberglass repair, welding, sonar dome repair, non-destructive testing, masker belt repairs, and painting operations.
Welldeck Discharges	Water and residuals from precipitation, equipment and vehicle washdowns, washing gas turbine engines, graywater from stored landing craft, and general washdowns of welldecks and vehicle storage areas.

Table ES-2. Discharges Determined To Not Require MPCDs

Discharge	Description
Boiler Blowdown	Water removed from the boiler system to prevent particulates, sludge, and treatment chemical concentrations from accumulating.
Catapult Wet Accumulator Discharge	Steam and water discharged from the wet accumulator tank to keep the water level in the accumulator within operating limits. The catapult wet accumulator provides steam to operate the catapult during aircraft launching.
Cathodic Protection	Zinc, aluminum, and chlorine-produced oxidants released during the consumption of sacrificial anodes and the operation of impressed current cathodic protection systems. The purpose of cathodic protection is to prevent hull corrosion.
Freshwater Lay-Up	Freshwater used to fill condensers when submarine seawater cooling systems are placed in stand-by mode, or "lay-up." While the condenser is in lay-up mode, the water is discharged and refilled approximately every 30 days.
Mine Countermeasures Equipment Lubrication	Lubricating grease and oil released from mine countermeasures equipment that is towed behind vessels to locate and destroy mines.
Portable Damage Control Drain Pump Discharge	Seawater and harbor water that is discharged by the portable damage control drain pumps during pump maintenance, testing, and training.
Portable Damage Control Drain Pump Wet Exhaust	Water used to quiet and cool the exhaust from gasoline- and kerosene-fueled portable damage control drain pumps. Portable damage control drain pump wet exhaust discharge occurs during training and monthly planned maintenance activities.
Refrigeration /Air Conditioning Condensate	Condensate from air conditioning, refrigerated spaces, and stand-alone refrigeration units. The condensate is collected in drains and is either discharged directly overboard or held in dedicated tanks before discharge.
Rudder Bearing Lubrication	Grease and oil used to lubricate rudder bearings. The grease and oil can be released while the vessel is moving, when the rudder is used, or when pierside because the oil lubricant is slightly pressurized.
Steam Condensate	Condensate from steam used to operate auxiliary systems, such as laundry facilities, heating systems, and other shipboard systems, that drains into collection tanks and is discharged overboard.
Stern Tube Seals and Underwater Bearing Lubrication	Lubricants used in propeller support struts and bearings that can be released to the environment.
Submarine Acoustic Countermeasures Launcher Discharge	Water contained in the acoustic countermeasures Mk 2 launch tube after the countermeasures device is expelled.
Submarine Emergency Diesel Engine Wet Exhaust	Water used to quiet and cool the exhaust of submarine emergency diesel engines. These emergency diesel engines are operated for equipment checks that occur before submarine deployment, during monthly testing, and during periodic trend analyses.
Submarine Outboard Equipment Grease and External Hydraulics	Grease applied to a submarine's outboard equipment. The grease is released to the environment by erosion from mechanical action of seawater while the submarine is underway and by slow dissolution of the grease into the seawater.