

UNDS *tidings*

Uniform National Discharge Standards



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RDT&E—A Cornerstone of the Navy's Environmental Program

Environmental compliance and pollution prevention are an integral part of the Navy's mission; research, development, testing & evaluation (RDT&E) have become one cornerstone of the Navy's environmental program. Shipboard environmental RDT&E is conducted through the Shipboard Waste Management Project within the Naval Sea Systems Command's Advanced Development Environmental Protection Program. The Navy's approach to shipboard environmental technology development is as follows:

1. Define existing and, to the extent possible, future environmental requirements applicable to Navy vessels;
2. Review commercially available environmental equipment and systems for potential applicability to Navy vessels;
3. Identify / develop environmental equipment, systems, and practices to address shipboard environmental issues, taking into account operational, habitability, and cost impacts;
4. Test prototype systems in the laboratory and aboard ship; and
5. Determine installation, operation, and logistics support requirements for new environmental systems.

The Navy's ongoing RDT&E is aimed at developing effective technologies to minimize adverse environmental impacts of ship operations and preparing the Navy for future regulatory requirements, such as UNDS. The Navy's goal is to minimize and, where necessary, treat liquid waste by producing: 1) water suitable for discharge; and 2) a concentrate for storage and/or disposal aboard ship or ashore.

NAVSEA shipboard waste management RDT&E encompasses solid wastes, liquid wastes, ozone-depleting substances, hazardous materials, and other environmental concerns. Liquid waste treatment technologies being investigated for the management of the major effluents include: oily waste (primarily bilgewater), graywater (from showers, sinks, laundry, etc.), and sewage. The Navy is investigating potential non-sewage liquid waste technologies which will be considered under the UNDS program.

Once established, UNDS will provide new guidance for the Navy's liquid waste RDT&E efforts by defining performance standards for Marine Pollution Control Devices (MPCDs). The guidance will help the Navy move closer to its objective of an "Environmentally Sound Ship of the 21st Century." This article highlights the Navy's shipboard environmental RDT&E program as it pertains to UNDS.

CONTENTS

RDT&E—A Cornerstone of the Navy's Environmental Program	1
Recent Progress	3
UNDS Fast Fact	3
Frequently Asked Questions	4

next issue of UNDS *tidings* ...

Pollution Control
Technologies



Benefits of RDT&E

Using current technology and waste management practices, the cost of liquid waste disposal can represent a substantial portion of ship operating funds. A preliminary NAVSEA estimate indicates that these costs exceed \$60 million per year Fleet-wide. RDT&E investments in shipboard environmental compliance, pollution prevention, and new technology can reduce these costs as well as shorten maintenance cycles, improve reliability, and enhance military readiness. Recognizing the value of technological developments, the Navy has structured its RDT&E shipboard waste management program to achieve the following objectives:

- ✓ Manage shipboard wastes in compliance with existing environmental restrictions worldwide without jeopardizing ship mission, survivability, or habitability;
- ✓ Minimize the cost of Fleet environmental compliance;
- ✓ Significantly reduce the logistic burdens and costs associated with shoreside offloading and disposal of ship wastes; and
- ✓ Enhance the sailor's quality of life aboard the ship.

RDT&E Challenges

The Navy executes its aggressive RDT&E program in the face of several challenges, including budget constraints, vessel practicability requirements, and increasingly stringent environmental requirements to ensure environmentally responsible Fleet operations. Another important consideration is the quality of life at sea, because sailors work and live on warships for weeks or months at a time.

Due to tightened budgets, all expenditures—including environmental efforts—must be justified. The Navy is conducting return-on-investment analyses on shipboard environmental RDT&E programs. However, this is extremely challenging as environmental costs and benefits are difficult to quantify. The Navy may also conduct a more quantitative cost analysis by evaluating shipboard environmental systems vs. land-based systems.

For example, because shoreside liquid waste reception and disposal facilities represent high fixed and operational costs, the Navy expects to gain substantial savings as the Fleet becomes less dependent on shoreside facilities and develops and implements shipboard systems.

Because of their military mission, most armed forces vessels are largely devoted to weapons and combat systems; living areas for the sailors and other personnel needed to carry out the vessel's mission; and the engines and machinery that make the vessel work. Environmental systems must often compete with these high-priority demands for shipboard space, weight margin, and manning requirements.

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Another major challenge is to develop environmental equipment that can function effectively and reliably under very demanding conditions while a ship is at sea for as long as six months. As with other shipboard systems, environmental equipment must meet a wide range of requirements, including size and space, weight, reliability, maintainability, manning, shock, vibration, electromagnetic compatibility, acoustics, noise, ship systems integration, survivability, and safety and health. Commercial equipment usually must be modified before it can be used on an armed forces vessel.

RDT&E and UNDS

With the exception of sewage (which is already regulated under the Clean Water Act), the UNDS program will address liquid effluents incidental to the normal operation of armed forces vessels. The UNDS legislation is intended to achieve a reasonable level of environmental protection compatible with the design, operational, habitability, and cost constraints of DoD ships and submarines.

In signing the UNDS statute, Congress intended to stimulate the development of innovative vessel pollution control technology through the promulgation of federal performance standards for MPCDs. An MPCD may be any equipment or management practice for installation or use on board a vessel.

MPCDs may be available via off-the-shelf, previously developed technologies, or the result of new research initiatives. If practicable equipment from the commercial sector or previous Navy research does

RDT&E con't...

not exist, and a technological MPCD is required, the Navy will conduct RDT&E to develop and qualify the necessary technology.

The Navy and EPA will evaluate each MPCD option in terms of its practicability on-board a ship. Factors may include:

reliability • maintainability • habitability
shock/vibration • ship interface • manning

RDT&E to Support the Environmentally Sound Ship of the 21st Century

The Navy's shipboard waste RDT&E is driven by existing compliance requirements and the Chief of Naval Operation's vision for an Environmentally Sound Ship of the 21st Century. An environmentally sound ship is one that:

- Operates worldwide without causing significant adverse environmental impacts and complies with all applicable environmental requirements; and


- Minimizes dependence on shore facilities, use of hazardous materials onboard, and logistical costs for waste management.


Essentially, the Environmentally Sound Ship of the 21st Century is designed and operated to minimize waste generation, optimize waste management, and use shipboard systems to destroy or appropriately treat wastes generated onboard. To achieve these goals and comply with future regulations such as UNDS, the Navy is evaluating both technology options and pollution prevention opportunities. In the next issue of *UNDS^{tidings}*, we will explore in more detail some of these technologies and the MPCD options being considered.

In the last issue of UNDS^{tidings}, we incorrectly stated that the Navy contains sewage discharges on board a vessel within 12 nm. The Navy is exploring the practicability of holding sewage within 12 nm; however, current requirements are to hold sewage within 3 nm.

Recent Progress

UNDS development activity is proceeding rapidly to meet an aggressive schedule. To date, the effort has reached several milestones:

 **Kicking off the second round of equipment expert meetings to determine the nature of ship discharges (NOD).** The meetings will be held throughout March and April. NAVSEA, designated as the technical lead for the UNDS rulemaking process, is chairing the meetings.

 **Conducting ship checks and sampling of liquid discharges from ships to support the development of NOD analyses.** As of January 1997, at least eight ship checks were performed.

UNDS Fast Fact

A portion of the Navy's R&D efforts are funded through a partnership with the Department of Defense (DoD), the Department of Energy (DOE), the Environmental Protection Agency (EPA), and numerous other federal and non-federal organizations. The partnership, known as the Strategic Environmental Research and Development Program (SERDP), is working to coordinate R&D across agencies and facilitate information exchange regarding technological developments. SERDP focuses on cleanup, compliance, conservation, and pollution prevention technologies. For example, SERDP funding is being used to explore the feasibility of graywater treatment systems using membrane technology to meet anticipated U.S. and international discharge standards, such as UNDS.

Frequently Asked Questions

The UNDS rulemaking is a dynamic process that has generated a great deal of interest and several questions. Here are the answers to recent questions:

Q: What is the Navy currently doing to manage liquid wastes?

A: The Navy has a long-standing commitment to developing and using technology to manage shipboard wastes. For example, all Navy ships have collection, holding, and transfer (CHT) systems to allow ships to transit coastal zones without releasing sewage and most can use CHTs to collect and hold graywater while in port. Also, approximately 88% of Navy ships are equipped with oil/water separators and oil content monitors to remove oil from bilgewater before discharge.

Q: Will UNDS regulate vessel air emissions?

A: No. With the exception of sewage, UNDS regulates *liquid* discharges into water bodies. Under normal operations, Navy vessel air emissions are regulated under the appropriate Clean Air Act programs.

*The UNDS Homepage has moved!
The new address is...*

<http://www.n4.hq.navy.mil/n45b/unds.html>

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