
NEW REGULATION OF OCEAN DUMPING: DISCHARGED BALLAST WATER MUST BE CLEAN

By JOEL C. MANDELMAN*

I. The Invasive Species Problem

Every oil tanker, freighter and cruise ship carries ballast water. A typical oil tanker will carry as much as 20 million gallons of ballast water and a freighter, depending on its size, from 6 to 10 million gallons. As cargo is taken on board an equivalent weight in ballast water must be discharged, so that the vessel remains stable. When cargo is unloaded, the process is reversed. Without ballast water, a ship will become dangerously unstable, unable to operate efficiently and it may even capsize and sink. The preferred place to discharge ballast water is while the vessel is in port.¹ But most nations no longer allow ships to do that. They now require that the ballast water be exchanged, typically 200 miles off shore, before the vessel enters a port. The theory underlying this practice is that the exchanged ballast water is cleaner.² Unfortunately, it is usually not appreciably cleaner than the sea-water for which it is exchanged. Such ballast water will probably contain almost as many invasive species by the time the ship reaches port as a ship that never conducted a deep ocean exchange.³

All ballast water contains aquatic nuisance species. These species are nature's invisible threat to the environment. They range in size from a single micron *in vibrio cholera* or *e. coli* bacteria to visible creatures such as Chinese mitten crab and zebra mussel larvae.⁴ Invasive species cause billions of dollars in damage to wetlands, water supplies and to local power plants and waste water treatment systems. The problem is not limited to the United States. Star fish invaded ports in Australia and have caused similar environmental and economic damage. Other invasive species threaten virtually every port, river and lake on which ships sail worldwide.⁵ The estimated cost of the damage caused by these species in the United States runs into the billions of dollars annually.⁶

II. Pending Legislation and the IMO Treaty

Both the United States Congress and the United Nations, acting through the International Maritime Organization (IMO), have recognized the magnitude of this problem and are attempting to devise statutory and regulatory abatement remedies.

The regulation of invasive species is one of the few environmental issues where there is little disagreement as to the reality of the problem. Unlike global warming or automobile mileage standards, affected interest groups agree that there is a problem. The shipping industry, the government and environmental groups agree that action must be taken. The disagreement is focused almost exclusively on defining "how clean is clean" and when to mandate the use of ballast water treatment technology.⁷ Currently, there is no requirement that ballast water be treated prior to discharge. There is only a Coast Guard "rule" requesting that ballast water be exchanged more than 200 miles off-shore. If the ship's captain is unable to do so, he is supposed to notify the Coast Guard prior to entering the port in which the water will be discharged.⁸

There is wide spread dissatisfaction with the absence of meaningful Coast Guard regulation of the treatment of ballast water prior to its discharge. As a result, several bills are pending in Congress to deal with the problem. The first is the Inouye Stevens Ballast Water Management Act. The Senate Commerce Committee held hearings on that bill, on June 15, 2005. The bill was revised and unanimously approved and reported on July 15, 2005. The Senate Environment & Public Works Committee is also considering the Levin-Collins National Aquatic Invasive Species Act⁹ and the House is considering the parallel Gilchrest-Ehlers bill,¹⁰ but hearings have not been scheduled in either chamber. The House Transportation & Infrastructure Committee is now redrafting its own version of a ballast water management bill.¹¹

Also under consideration is the International Maritime Organization's International Convention for the Control & Management of Ships' Ballast Water and Sediments, February 16, 2004 (hereafter "the IMO Treaty"), which was ratified by the IMO in February 2004. The Bush Administration is considering whether to submit the Treaty to the Senate for ratification but a decision on that is not expected before 2006. That Treaty is now being analyzed by an inter-agency task force which includes the State, Commerce and Interior Departments in addition to the Navy, the Coast Guard and the Justice Department. The State Department is awaiting receipt of numerous additional enforcement regulations that will implement the IMO Treaty. Until those draft regulations are reviewed it is unlikely that any recommendation will be sent to the President. After those recommendations are reviewed, the President will decide whether to submit the Treaty to the Senate. Of course, passage of any ballast water legislation by Congress would make ratification of the Treaty a moot issue.

A. Federal Litigation

In April 2005, the U.S. District Court in San Francisco ruled that the Environmental Protection Agency (EPA) had violated the National Pollution Discharge Elimination System (NPDES) Permit requirements of the Clean Water Act by failing to regulate ballast water discharges as point source discharges.¹² It has been EPA's position, for more than 30 years, that it had discretion under the Clean Water Act to exempt ships from the NPDES requirements. The Court ruled that such regulation was mandatory. Had the Court's decision been implemented, EPA would have been forced to immediately adopt ballast water treatment regulations, determine the appropriate discharge and treatment requirements and begin testing and certifying ballast water treatment technology. EPA has no funds, no overall policy, no personnel and no testing facilities to carry out a regulatory program that would involve issuing permits, and closely regulating the activities of tens of thousands of ships that enter United States ports annually. As a result, the District Court delayed issuing a final order until November 2005. By that time, one of the pending ballast water bills may have been signed into law, thus making the lawsuit moot.

III. The Treatment Standard: How Clean is Clean Enough?

The first unresolved substantive issue is the mandatory treatment standard. Both bills and the IMO Treaty require that ballast water be cleaned up before being discharged, whether in-port or at-sea, but the question “how clean is clean enough?” remains unanswered.

Many members of the Senate and House, of both parties, have expressed dissatisfaction with the IMO Treaty’s performance requirements on the grounds that they are not sufficiently stringent. Many members of Congress have criticized the IMO standards as being too lax and urged adoption of the standards used in the Ballast Water Management Act.¹³ The bill’s standards are 100 times more stringent than those contained in the IMO Treaty.¹⁴

If Congress fails to act, by the end of 2006, it is likely that the Coast Guard will issue draft treatment regulations sometime in 2006. It is assumed that the Coast Guard will lean towards adopting the treatment standards at least at the level contained in Regulation D-2 of the pending International Maritime Organization (IMO) Treaty.

Regardless of the treatment standards that are finally adopted, the Coast Guard will still control the certification of equipment as meeting those standards and the Coast Guard will enforce compliance with them. However, the EPA will also have a role in determining “how clean is clean enough.”

The essential difference between the version of Levin Collins’ NAIS bill (S. 770), the IMO Treaty’s Regulation D-2 and the Inouye Stevens bill (S. 363) are clear cut. Both the IMO Treaty and the Inouye Stevens bill require that no more than a specified number of invasive species be allowed in treated ballast water. The IMO standard is that, in most instances, no more than 1 microbe (of any kind) may be contained in 1 cubic meter of treated ballast water. The Inouye Stevens standard is that no more than 0.1 microbes may be found in 10 cubic meters of treated ballast water, a standard 100 times more stringent than the Treaty. Neither the Treaty nor the bill differentiates between types of microbes so 1 bacteria that is only 1 micron in size is not distinguished from a zebra mussel larvae that might be a half inch in size or larger. Differing quantitative standards are used for specified types of colony forming bacteria such as *e. coli* and *invibrio cholera*.

The 2005 NAIS bill uses an entirely different approach. That draft of the NAIS bill contemplates using a Best Available Control Technology standard.¹⁵ This means that the treatment standard could become more stringent every few years. The shipping industry is opposed to this approach because it lacks a specific treatment requirement.

Prior versions of the NAIS bill, introduced in 2000, 2001 and 2003, mandated that 95 percent of the ballast water be exchanged for “clean” ballast water or that 95 percent of the invasive species contained in the original supply of ballast water be killed by whatever treatment technology was used. That approach has now generally been abandoned because deep ocean exchanges frequently remove only 50 percent of the unwanted invasive species and that many of these re-grow prior to the ship reaching port.

Beyond that defect, it would have been exceptionally difficult to enforce. Any percentage reduction standard would require that microbe counts be conducted both before and after each ballast water discharge. This is an expensive and time consuming process that must be done in a well equipped laboratory, not on-board a ship. Second, the underlying theory is absurd and fundamentally flawed. A 95 percent reduction for a vessel carrying ballast water containing 10,000 microbes per cubic meter of water would leave only 500 microbes and result in fairly clean water. But a 95 percent reduction for a vessel carrying ballast water with 1 million microbes per cubic meter would leave 500,000 invasive microbes in each cubic meter of treated water and result in a dangerous quantity that, although “clean” under the NAIS standard, is hardly desirable. For these reasons, the percentage reduction approach has been abandoned.

It is probable that any legislatively mandated treatment standard will initially be the IMO standard which will be ratcheted up to the Inouye Stevens standard after the treatment requirement has been in effect for several years and environmental protection agencies have had the opportunity to analyze its impact on water quality.

IV. Other Unresolved Issues

A. When Should Treatment be Required?

To date, at least 25 companies have registered technology with the International Maritime Organization for future evaluation. Thus, there will likely be effective and affordable treatment on the market in 2006. Therefore, it has been recommended to Congress that the deadline for treating ballast water be moved up. Under that proposal, affected ship owners would have no more than 18 months after the date on which the Coast Guard certified the availability of an effective treatment technology to install it on their ships.

B. Retrofitting Will Save Ship Owners Money

The related issue of retrofitting must also be dealt with. There are now at least 25,000 ships in service world-wide that transport and discharge ballast water. If the requirement that ballast water be treated is limited to ships built after 2009 (and in many cases built after 2016) then there will be 30,000, or more, ships discharging untreated ballast water for another 25 or 30 years all over the world. If affordable technology is available in 2006, that can be installed at a reasonable cost, and with no appreciable down time for the vessel involved, then there is every logical reason to require that all ships—except those that will be scrapped within 5 years—to be retrofitted with treatment equipment.

C. Federal Preemption of State Ballast Water Treatment Laws

Finally, there is the politically sensitive issue of federal preemption. The Chamber of Shipping of America has urged the adoption of an amendment that would make it explicitly clear that the Ballast Water Management Act provided the sole legislative authority for mandating the treatment, and regulating the discharge, of ballast water. This proposal would prevent conflicting regulation of such discharges under the Clean Water Act. That amendment was approved when the Senate Commerce Committee reported the bill on July 15, 2005.

There is substantial support for the proposal among governors of states bordering the Great Lakes. In November 2004, Governor Robert Taft (R-Ohio) wrote to Senator George Voinovich (R-Ohio). Governor Taft sent this letter in his capacity as Chairman of the Council of Great Lakes Governor's. He told Senator Voinovich that, "I encourage Congress to act on the [invasive species issue] because we recognize that a consistent nationwide strategy is more effective than individual state government strategies [in dealing with invasive species]." Governors of other Great Lakes states have expressed similar views.

D. Proving That the Ballast Water Has been Treated

In terms of enforcing the bill's treatment requirements, it is essential that a ship captain's ability to prove to the Coast Guard that the ship has complied with those requirements be temporally and economically feasible. This is especially critical if proof of treatment must be presented each time a ship enters a port and discharges ballast water or has done so inside the Exclusive Economic Zone.

It has been suggested that after the Coast Guard certified that a given technology meets the established treatment standard, that the ship's captain certifying that the approved equipment was in operation for the required time period be accepted as proof of compliance.

Testing for the required level of a TRO is easily performed. Nutech, for example, can provide customers with off-the-shelf, automated equipment that will measure TRO levels as the System is in use. This is less difficult and less time consuming than testing a swimming pool's water for the proper level of chlorine. Use of this testing procedure is not limited to ozone injection treatment technology. This technique should work as well with other biocides producing bio-chemical residuals. *Thus, requiring that the Coast Guard (and EPA) accept TRO levels as proof of compliance would not give Nutech a competitive advantage over other biocide-based technologies.*

Conducting microbe counts, on the other hand, is not a practical or economical means of proving that compliance especially on a multiple trip, or multiple port entry basis. Such counts are very expensive. They require trained, scientific personnel. Expensive laboratory equipment is required. It can take several days to transport ballast water samples from a ship to a laboratory. The microbe count could rapidly increase (or decrease) during shipping, thus providing inaccurate results to an enforcement agency. For all of these reasons, such counts cannot routinely be conducted on board a ship.

Moreover, it is doubtful that taking a few ballast water samples, even from widely dispersed areas of a ballast tank is a statistically accurate method for proving that the ballast water has been treated to a specific microbe per cubic meter of water standard. A typical oil tanker carries 12 to 18 million gallons of ballast water in a ship that has ballast water compartments running the entire length, width and height of a ship that may be 1,000 or more feet long, 125 feet wide and 100 or more feet high. It is highly improbable that a few gallons of water taken randomly from those ballast tanks will be representative of the content of the ship's ballast water. This is especially true since it is practically impossible to

take samples from tanks immediately above the bottom of the ship's hull.

While it may be desirable to such sampling annually, or on some other periodic basis, to establish another reference point for gauging the effectiveness of a treatment system, it is not practical to do so during every port entry. Testing has proven that the presence of a Total Residual Oxidant (TRO) is an effective and scientifically accepted methodology for proving that ballast water has been properly treated. This identical methodology has been in use, for decades, to prove that drinking water has been properly chlorinated (or ozonated) pursuant to the Safe Drinking Water Act's Surface Water Treatment Regulations.

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Footnotes

¹ *Id.*

² *Id.* and U.S. Coast Guard Advanced Notice of Proposed Rule Making, March 2003.

³ JAKE C. PERRINS ET AL., SCHOOL OF AQUATIC & FISHERY SCIENCES, UNIVERSITY OF WASHINGTON, OZONE FOR TREATMENT OF MARINE BALLAST WATER: FORMATION & DECAY OF TOTAL RESIDUAL OXIDANT; and ADAM JONES ET AL., DEP'T OF CHEMISTRY & BIOCHEMISTRY AND CENTER FOR MARINE SCIENCE, UNIVERSITY OF NORTH CAROLINA-WILMINGTON TOXICITY OF OZONATED SEAWATER TO MARINE ORGANISMS.

⁴ *Id.* Pps. 1-10 and Hearings before the Senate Committee on Commerce, Science & Transportation, Subcommittee on National Ocean Policy Study, June 15, 2004, on S. 363, Ballast Water Management Act.

⁵ *Id.*

⁶ *Id.*

⁷ Hearings on S. 363, Ballast Water Management Act, before the Subcommittee on National Ocean Policy Study, Senate Committee on Commerce, Science & Transportation, June 15, 2004.

⁸ See 33 C.F.R. Part 151, Sub-part C.

⁹ S. 770, Introduced on April 13, 2005.

¹⁰ H.R. 1591.

¹¹ As of August 1, 2005, no other bill has been introduced in the House.

¹² Northwest Ocean Protectors v. Environmental Protection Agency, ___ F. Supp. 2d ___ (N.D. Cal. 2005).

¹³ Hearings before House Committee on Transportation & Infrastructure, March 24, 2004 and before the Senate Committee on Commerce, Science & Transportation, June 15, 2005.

¹⁴ See S. 363, Ballast Water Management Act, § 1101(f) and Annex 2, Regulation D-2 to the IMO Treaty.

¹⁵ See S. 770, National Aquatic Invasive Species Act, §§1101(a)(4) and (b)(3)(A).