2008 Summary of Great Lakes Seaway Ballast Water Working Group

March 2009

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Chapter 1 – Executive Summary

The 2008 Summary of Great Lakes Seaway Ballast Water Management report was compiled by the Great Lakes Seaway Ballast Water Working Group (BWWG), comprised of representatives of the United States Coast Guard (USCG), the U.S. Saint Lawrence Seaway Development Corporation (SLSDC), Transport Canada - Marine Safety (TCMS), and the Canadian St. Lawrence Seaway Management Corporation (SLSMC). The group's mandate is to develop, enhance, and coordinate binational enforcement and compliance efforts to reduce the introduction of aquatic invasive species via ballast water. The BWWG is actively engaged and providing an energetic response to calls for tougher ballast water regulation of ocean-going ships transiting the Seaway.

In 2008, there was marked improvement over the prior year's inspection program statistics in a number of areas, including ship compliance rates. In 2008, 99% of ships bound for the Great Lakes Seaway received a ballast tank exam. A total of 6704 ballast tanks, onboard 364 different ships, were sampled and had a 98.6% compliance rate. Ships that failed to properly manage their ballast tanks were required to either retain the ballast water and residuals on board, treat the ballast water in an environmentally sound and approved manner, or return to sea to conduct a ballast water exchange. In addition, 100% of ballast water reporting forms were screened to assess ballast water history, compliance, voyage information and proposed discharge location. The BWWG anticipates continued high ship compliance rates for the 2009 navigation season.

Today, ballast water management requirements in the Great Lakes and the St. Lawrence Seaway System are among the most stringent in the world. Mandatory ballast water regulations that include saltwater flushing, detailed documentation requirements, increased inspections, and civil penalties provide a comprehensive regulatory enforcement regime to protect the Great Lakes Seaway System. U.S. Coast Guard regulations, Transport Canada's Ballast Water Control and Management regulations, and the Seaway NOBOB regulation, require all ships destined for Seaway and Great Lakes ports from beyond the exclusive economic zone (EEZ) to exchange all their ballast tanks at sea. As a result, the risk of a ballast water mediated introduction of aquatic invasive species into the Great Lakes has been mitigated to extremely low levels.

Several issues are currently affecting ballast water management on the Great Lakes Seaway. The Coast Guard is engaged in a rulemaking that would set a performance standard for the quality of ballast water discharged in U.S. waters. The current status of that rulemaking is covered below. Additionally, the U.S. Environmental Protection Agency (EPA) recently began to regulate ballast water through National Pollutant Discharge Elimination System (NPDES). Their recent rulemaking incorporates the Coast Guard's mandatory ballast water management and exchange standards and supplemental ballast water requirements for vessels that carry ballast water.

Furthermore, for all covered vessels, this permit would establish requirements for 27 other discharge types including deck runoff, bilge water discharge and gray water discharge. More information can be found at http://cfpub.epa.gov/npdes/home.cfm?program_id=350.

In the absence of a Federal standard, individual States have passed rules regulating ballast operations in their waters. Within the Great Lakes, each state has different requirements for their ballast water management programs. Michigan and Minnesota both have a ballast water permitting program in place. Many other states have regulations in varying states of approval. A summary of State ballast water regulations can be found at http://cfpub.epa.gov/npdes/docs.cfm?program_id=14&view=allprog&sort=name#certification.

Chapter 2 – Joint Ballast Water Management

Ballast Water Management on the Great Lakes Seaway System

Regulations protecting the Great Lakes Seaway system include Ballast Water Control and Management Regulations under the Canada Shipping Act, USCG ballast water regulations pertaining to ships equipped with ballast tanks, Best Management Practices for no ballast onboard (NOBOB) ships entering the U.S., and the St. Lawrence Seaway's NOBOB requirements. These regulations apply to all ships entering waters under Canadian and U.S. jurisdiction from outside the Canadian EEZ and apply to ships on both oceanic and coastal voyages. Loaded ships with residual sediments are required to flush their tanks with water of a salinity equivalent to ballast exchange. Best management practices call for ships to conduct mid-ocean ballast water exchange during ballast laden voyages in an area 200 nm from any shore, whenever possible. For ships unable to conduct mid-ocean ballast exchange due to cargo, they are asked to conduct saltwater flushing of their empty ballast water tanks in an area 200 nm from any shore whenever possible. Salt water flushing is defined in U.S. policy as the addition of mid-ocean water to empty ballast water tanks; the mixing of the flush water with the residual water and sediment through the motion of the ship; and the discharge of the mixed water, such that the resultant residual water is as high salinity as possible, preferably greater than 30 ppt.

2008 St. Lawrence Seaway NOBOB Requirement:

The U.S. and Canadian St. Lawrence Seaway agencies enacted new requirements effective at the start of the 2008 navigation season that require ships to conduct saltwater flushing of ballast tanks that contain residual amounts of ballast water and/or sediment in an area 200 nautical miles from any shore before entering waters of the Seaway. Ships must also maintain the ability to measure salinity levels in each tank onboard so that final salinities of at least 30 ppt can be ensured.

All four agencies committed resources to accomplishing the additional work required to carry out the increased tank inspection program. The overall goal of the 2008 inspection program was to inspect each ship entering the system from outside the EEZ on every transit and increase the number of tanks tested.

2008 Initiatives

Seaway Corporations' Ballast Water Inspection Media & Stakeholder Event:

The SLSDC and the SLSMC co-hosted a historic ballast water inspection media and stakeholder event in Montreal, Quebec, May 5 and 6, 2008. Both events proved to be well attended and received praise from participants for the comprehensive agenda that provided a strong draw. Participants were able to actually view a ballast water inspection up close, onboard Fednav's M/V FEDERAL KIVALINA, and had the

opportunity to tour the ship's engine room and bridge, receiving expert guidance from seasoned marine professionals on ballast water management practices.

Stakeholders that participated included the New York State Department of Environmental Conservation, the State of New York Attorney's General Office, a Minnesota State Senator, Minnesota Pollution Control Agency Commissioner, Environment Canada and Nature Quebec.

U.S. Coast Guard Discharge Standard:

The Coast Guard is engaged in a rulemaking that would set a performance standard for the quality of ballast water discharged into U. S. waters. This rulemaking is being carried out under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 and the National Invasive Species Act of 1996, which authorize the Coast Guard to approve alternative ballast water management systems (BWMS) that are found to be at least as effective as mid-ocean ballast water exchange (BWE) in preventing aquatic invasive species introductions. As the effectiveness of ballast water exchange varies from ship to ship, the Coast Guard believes that setting a performance standard would be the most effective way for approving BWMS that are environmentally protective and scientifically sound. Currently, this rulemaking is in clearance.

Chapter 3 - Results of 2008 Ballast Management Exams

Ballast Water Reporting Form

Ships bound for the Great Lakes from outside for the EEZ are required to submit a ballast water reporting form before entering Canadian waters and again 24 hours prior to entering the St. Lawrence Seaway. The ship lists voyage information, ballast water usage/capacity, ballast water management, ballast water sources, ballast water management practices, and proposed discharge location.

- ***In 2008, 100% of ballast water reporting forms were screened to assess ballast water history, compliance, and intentions.***

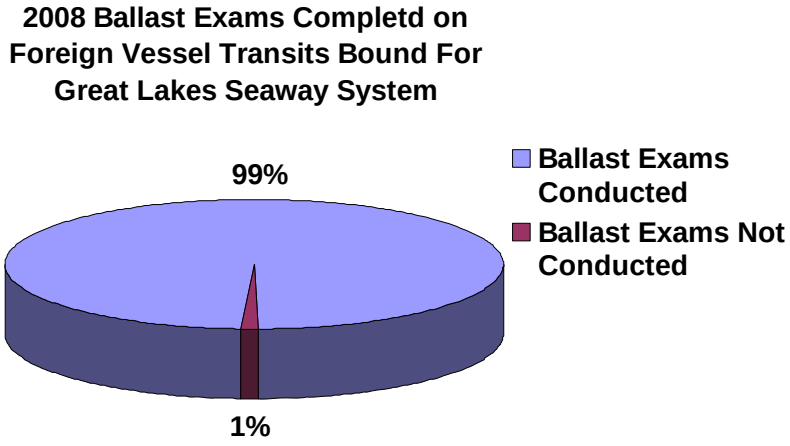
Ballast Water Management Exams

The Joint Ballast Water Management Exam Program uses a comprehensive approach to ship inspections. The inspection begins with a detailed review of ballast water reports, logs, records and ballast water management plans. The crew is interviewed to assess their understanding of the requirements of the ship's Ballast Water Management Plan as well as answer questions on actual practices. Finally, ballast tanks are sampled for salinity or the presence of mud that would suggest a satisfactory management practice was not employed.

Ship Inspection Totals

- ***364 or 99% of ships bound for the Great Lakes Seaway from outside the EEZ received a ballast tank exam, compared with 74% in 2007.*** *Three ships did not receive a ballast exam; they were screened through administrative measures.*

The chart below summarizes the total exams completed in 2008 by at least one of the four Ballast Water Working Group agencies. "Ballast Water Management Exams Conducted" is the percentage of ships inspected by a joint team of any combination.

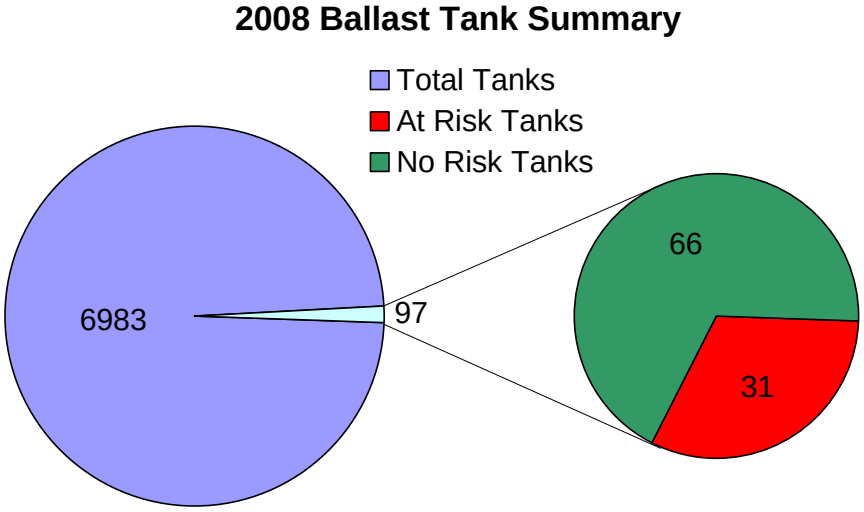


Ballast Tank Sampling

Ballast water is typically found in wing tanks, double bottom tanks, peak tanks, and cargo holds. Access to these tanks is normally gained through vents, sounding tubes or hatches. Normal procedure calls for the inspector to utilize the sounding tube or vent for primary access. Manhole covers and hatches may be used if access cannot be gained access via a primary means. Ballast water salinity is checked using a hand held salinity refractometer or with an electronic meter. The results of the sampling are captured on a sampling report form created by the BWWG.

- ***6704 of 6983 tanks, or 96% were sampled, compared with 78% in 2007.***
- ***97 tanks on 63 ships were issued a Letter of Retention, compared with 46 ships in 2007.***
    - ***Only 31 of the 97 tanks were considered high risk due to no record of treatment, low salinity, or the presence of mud.***
    - ***66 were considered low risk for carrying invasive species.*** *These tanks were either no longer used as part of the vessel's ballast operations or the tanks contained fresh water taken on at a shore side facility for cooling or potable water, however, since the tanks were still connected to the ballast water system they were required to be retained.*
- ***Compliance rate for tanks sampled was over 98.6%, compared with 95% in 2007.***

The chart below summarizes the number of tanks that were sampled by TCMS, USCG, or the St. Lawrence Seaway Corporation inspectors.



Chapter 4 – Summary of Enforcement and Regulatory Action

Regulatory Actions

Regulatory action is limited to the jurisdiction of each agency. Information exchanged between agencies ensures appropriate action is taken to address discrepancies. The various tools commonly used for discrepancies include education, a Letter of Warning, a Letter of Retention or a fine issued through a Notice of Violation.

Letters of Retention

Ships with noncompliant tanks that choose to retain, in lieu of another management option, are issued a Letter of Retention. When the ship departs the system, compliance is verified and the Letter is rescinded. It is important to note that Letters of Retention were issued for some tanks that are not actually used for ballast water, but are listed in their system such as potable or cooling water tanks.

- ***BWWG agencies issued a Letter of Retention for 63 ships.***

Letters of Warning

A Letter of Warning is issued by U.S. Coast Guard or Transport Canada when a ship is found with discrepancies in its ballast water management plan, records or reports. It is used for minor first time offenses with a warning of possible assessment of a fine if not corrected.

- ***The USCG issued 10 Letters of Warning and Transport Canada issued 18.***

Notices of Violation

A Notice of Violation imposes a fine on a ship for failure to comply with regulations. For example, U.S. Coast Guard fines associated with ballast water vary from $500 to $1000 for the first offense and may reach $6,000 for repeated offenses.

- ***The USCG issued 1 Notice of Violation for ballast water report form issues.***

Chapter 5 – Conclusion

For any regulatory regime to be effective, all the Great Lakes and the St. Lawrence Seaway must be treated as a single system. The only way to ensure consistent ballast discharge regulations across the Great Lakes Seaway System is to have strong federally mandated standards managed by unified federal agency coordination between Canada and the U.S. A patchwork of state or province led regulatory ballast water regimes within the Great Lakes Seaway increases the legal, operational and administrative burden of inconsistent regulations and negatively impacts ship compliance and operation. Even worse, is that this suite of regulations would effectively deter ships from transiting or completing loading/unloading operations in some state waters. The current high effectiveness of ballast water exchange coupled with the BWWG's aggressive enforcement of current regulations and the high industry compliance rate minimize the urgency for state involvement in ballast water regulation. Further impediments to ship trade will make the shipping industry and the associated economic stimulus even less viable in the future.

The St. Lawrence Seaway is uniquely situated to prevent the further introduction of invasive species. With a central inspection point, situated outside of the lakes, the ballast water tanks of all inbound ships are inspected by both Canada and the United States. Joint ship inspections by Transport Canada, the U.S. Coast Guard, and the U.S. and Canadian Seaway Corporations have been regularly conducted in Montreal. This inspection process, in place since 1997, has been successful in enhancing the operational and environmental security of the Great Lakes St. Lawrence Seaway System. Improvements are continually being made to the inspection programs to incorporate updated procedures and technology. All four agencies work cooperatively in a binational manner to address issues as they arise. The new Seaway regulation harmonizes the ballast water requirements for ships transiting the U.S. waters of the Seaway with those currently required by Transport Canada for transit in waters under Canadian jurisdiction of the Seaway. This regulation is intended to be an interim solution while the U.S. Coast Guard completes its ballast water discharge rulemaking, anticipated to be issued in the near future. The Ballast Water Working Group will continue its work to deter the introduction of aquatic invasive species in the Great Lakes using regulatory, technological, and management-based protocols. The agencies take the threat of invasive species very seriously and are dedicated to finding new answers to combat the problem.

Chapter 6 – Contributions

Members of the Ballast Water Working Group

U.S. Coast Guard, Ninth District would like to thank the following members of the Great Lakes Ballast Water Working Group and all the inspectors who contributed to the 2008 Joint Ballast Water Management Exam Program and to this final report.

Saint Lawrence Seaway Development Corporation
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For further information on the Great Lakes Ballast Water Program, please visit the following:

The Seaway website: http://www.greatlakes-seaway.com/en/environment/ballast-water/index.html

The NBIC website: http://www.hrw.com/science/si-science/biology/animals/marineinvasions/ballast.html

The USCG website: http://cgweb.comdt.uscg.mil/g-ms/g-mso/estandards.htm

Transport Canada's website: http://www.tc.gc.ca/en/menu.htm

Appendix

A Historical Review:

1989:

In response to calls from the International Joint Commission and the Great Lakes Fishery Commission over the discovery of the Ruffe in Lake Superior, Canada brought in guidelines requesting all ships entering the freshwaters of the St Lawrence River and the Great Lakes to exchange their ballast. The use of ballast water exchange was based on the effectiveness of Canadian studies undertaken by Environment Canada to protect the aquaculture facilities in the Magdalen Islands.

Early 1990's to 1997:

The U.S. Coast Guard brought in regulations based on the Canadian Guideline in 1993 under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA). Ballast Water on Board (BOB) ships, are ships that declare they have ballast tanks that contain ballast water. The U.S. Coast Guard started testing BOB ships on a voluntary basis in 1991 and on a mandatory basis in 1993. The inspection process included boarding ships between the two U.S. locks in Massena (Eisenhower and Snell) and testing the salinity of the ballast water to ensure salinity was at least 30 parts per thousand (ppt). Ballast with a salinity of at least 30 ppt is considered evidence that the tanks have been adequately exchanged with seawater, providing a reasonably harsh environment for any remaining organisms.

1997 to Present:

The U.S. Coast Guard, Transport Canada and the Seaway Corporations developed a joint inspection program called the "Enhanced Seaway Inspection" (ESI) for foreign flag ships, which covered applicable safety and environmental equipment onboard ships and is conducted prior the ship's initial transit of the Seaway Great Lakes System.

During the ship's ESI, a ballast tank inspection is conducted by one or more of the BWWG member agencies to ensure compliance with U.S., Canadian, and Seaway ballast regulations. The ship's ballast tanks are sampled to verify compliance with all BWWG members' regulations.

2002 St. Lawrence Seaway Requirement:

The U.S. and Canadian Seaways instituted a requirement that all foreign flag ships entering the Seaway Great Lakes System comply with the Best Management Practices of the Shipping Federation.

In addition, ships that do not operate beyond the EEZ but do operate within the Great Lakes and Seaway (i.e., lakers) must agree to comply with the Voluntary Management Practices to

Reduce the Transfer of Aquatic Nuisance Species within the Great Lakes by U.S. and Canadian Domestic Shipping, dated January 26, 2001. These voluntary management practices require ships to agree to regular inspections of ballast tanks and regular removal of sediment.

2004 U.S. Coast Guard National Mandatory Ballast Management Requirements

This final rule changed the national voluntary BWM program to a mandatory one, requiring all vessels equipped with ballast water tanks and bound for ports or places of the United States to conduct a mid-ocean BWE, retain their ballast water onboard, or use an alternative environmentally sound BWM method approved by the Coast Guard. We established penalties for failure to comply with the reporting requirements located in 33 CFR part 151 and broadened the applicability of the reporting and recordkeeping requirements to a majority of vessels bound for ports or places of the United States.

2005 U.S. Coast Guard NOBOB Best Management Practices:

As a result of the National Oceanic and Atmospheric Administration (NOAA) and Great Lakes Environmental Research Laboratory (NOAA/GLERL) study published in April 2005 and the risks identified therein, the U.S. Coast Guard and Transport Canada Marine Safety inspectors began examining NOBOB vessels in conjunction with the ESI in May of 2005. In August 2005, the U.S. Coast Guard issued its "NOBOB Best Management Practices". This policy recommends the ship to conduct mid-ocean ballast water exchange whenever possible and if not possible, to conduct mid-ocean salt water flushing. The goal of these practices is to raise the salinity level of residual, unpumpable ballast above 30 ppt. The increase in salinity reduces the likelihood of introducing aquatic nuisance species to the Great Lakes when the tanks are ballasted with Great Lakes fresh water at one port and deballasted in another Great Lakes port.

2006 Canadian Regulations:

Canada promulgated the Ballast Water Control and Management Regulations under the Canada Shipping Act in June of 2006. The regulations enact the IMO D1 requirements for ballast water exchange for any ship entering waters under Canadian jurisdiction from outside Canada's EEZ and include both trans oceanic and coastal voyages (BOB and NOBOB).

Additionally ships coming from outside waters under Canadian jurisdiction, declaring no ballast on board, must ensure that the residual ballast water in tanks has been exposed to salinity conditions equivalent to ballast water exchange by complying with one of the following options:

- The residual ballast water came from ballast water that was properly exchanged at sea;
- The residual ballast water meets the international standard for treated ballast water;

- The ship complies with sections 1, 2, 6 and 7 of the Code of Best Practices for Ballast Water Management of the Shipping Federation of Canada dated September 28, 2000, or;
- The ship conducted a saltwater flushing at least 200 nautical miles from shore.

Coastal Navigation information for either BOB or NOBOB: Ballast water that has been taken on board the ship, outside of waters of Canadian jurisdiction, on Coastal or Non-Transoceanic Navigation shall be exchanged to meet the prescriptions of Canadian BWCMR section 7-which means that a Mandatory Deviation if required to meet minimum depth of 500 meters – In winter months Section 6. (3) may apply under exceptional circumstances.

2006 Ballast Water Working Group (BWWG):

The Great Lakes Ballast Water Working Group (BWWG) was formed in January 2006.

The mission of the BWWG is to harmonize ballast water management efforts between the U.S. Coast Guard, Transport Canada-Marine Safety, St. Lawrence Seaway Development Corporation and the St. Lawrence Seaway Management Corporation. The BWWG coordinates enforcement and compliance efforts for reducing aquatic nuisance species invasions via ballast water and residuals in the Seaway and Great Lakes.

2008 St. Lawrence Seaway NOBOB Requirement:

The U.S. and Canadian St. Lawrence Seaway agencies enacted new requirements effective at the start of the 2008 Navigation Season that requires ships to conduct saltwater flushing of their ballast tanks that contain residual amounts of ballast water and/or sediment in an area 200 nautical miles from any shore before entering waters of the Seaway. Ships must also maintain the ability to measure salinity levels in each tank onboard so that final salinities of at least 30 ppt can be ensured.

All four agencies committed resources to accomplishing the additional work required to carry out the increased tank inspection program. The overall goal of the 2008 inspection program was to inspect each ship entering the system from outside the EEZ on every transit and increase the number of both BOB and NOBOB tanks tested.