

DEPARTMENT OF TRANSPORTATION  
MARITIME ADMINISTRATION  
COOPERATIVE AGREEMENT

PROJECT NUMBER: DTMA1H06004

TITLE: Support for the Evaluation and Demonstration of Ballast Water Treatment Technologies performed under the auspices of the North East-Mid West Institute (NEMWI)

MODIFICATION 0005

FUNDING DATA: 70101750RA.2010.81099CNSVC.25305.701099  
GLCNSVCO.61006600 - 11N10319 – Increase \$1,000,000

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AGENCY NAME AND ADDRESS: DOT/Maritime Administration  
Office of Acquisition, MAR-380  
1200 New Jersey Avenue, S.E. – W28/201  
Washington, DC 20590

MODIFICATION AUTHORITY: Article 7 – Funding Resources and Accountability

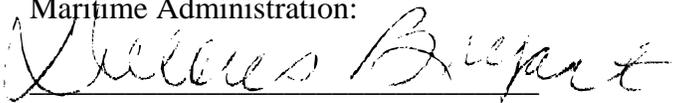
DESCRIPTION:

By this modification additional funding in the amount of \$1,000,000.00 is being added to the Cooperative Agreement to be used toward efforts associated with Milestones 4, 5, 6 and 7 of the Great Lakes Restoration Initiative (GLRI) requirements. The milestones are attached and are: #4 –Data analysis for 2 land-based tests (\$100,000), #5 – Reporting for 2 land-based evaluations (\$50,000), #6 – Prepping and designing 2 shipboard experiments (\$800,000), and #7 – Public outreach (\$50,000)

The period of performance for this task is from June 30, 2010 through December 31, 2010.

DEPARTMENT OF TRANSPORTATION

Maritime Administration:



Delores Bryant  
Agreements/Contracting Officer

Date: **July 15, 2010**

**Purpose:** To verify performance of ballast water treatment systems in order (eventually) prevent the introduction of aquatic nuisance species from ships' ballast water to the Great Lakes Ecosystem.

**Statutory Authority:** 31 U.S.C. § 1535(a)(3); 46 U.S.C. § 50105(a); 46 U.S.C. § 50101

**Description of Work:** Please see attached Revisions to Template document

**Points of Contact:** Carolyn E. Junemann (202) 366-1920 carolyn.junemann@dot.gov

**Applicable Goals, Objectives, and Measures from Action Plan:**

- **Long Term Goal 1** – The introduction of new invasive species (via ballast water) to the Great Lakes basin ecosystem is eliminated, reflecting a “zero tolerance policy” toward ANS.
- **Interim Objective:** Six (6) technologies that prevent the introduction of (aquatic) invasive species will be developed or refined and piloted by 2011. Ten (10) technologies that prevent the introduction of (aquatic) invasive species will be developed or refined and piloted by 2014.
- **Measure of Progress 1:** Number of non-native species newly detected in the Great Lakes Ecosystem – 2010 target=baseline (1.3 species per year).

**Milestones/Schedule, including deliverables:**

	Project Milestone/Significant Event	Anticipated Start Date *	Anticipated End Date *	Anticipated Cost
1	GSI Facility Upgrades	February 17, 2010	September 1, 2010	\$1,000,000
2	Prepping, testing, data analysis and reporting for 5 bench scale evaluations	February 17, 2010	October 31, 2010	\$150,000
3	Prepping (including purchasing, if needed), testing for 2 land-based evaluations	May 1, 2010	October 31, 2010	\$800,000
✓ 4	Data analysis for 2 Land-based tests	October 31, 2010	November 30, 2010	\$100,000
✓ 5	Reporting for 2 land-based evaluations	November 30, 2010	December 31, 2010	\$50,000
✓ 6	Prepping, designing 2 ship board experiments	September 1, 2010	December 31, 2010	\$800,000
✓ 7	Public outreach	February 17, 2010	December 31, 2010	\$50,000
	MARAD overhead			\$50,000
	Total			\$3,000,000

*This purchase order*

\*Note – these dates are based on receipt of funds from EPA by 1 February 2010

**Table 1. Breakdown of Milestones, Schedule and Costs**

\* Note: descriptions are on ensuing pages

**January 2010 Scope of Work**  
**Primary Topic Area: Invasives**  
**US DOT Maritime Administration**

**Title: Verifying Efficacy of Ballast Water Treatment Technologies on Great Lakes Ships in Great Lakes Waters.**

**Program/Project Description**

Since 2004, the only operative regulatory metrics for ballast discharge are contained in the International Maritime Organization (IMO) Ballast Water Management Convention. The Convention includes associated guidelines for Administrations to follow in approving systems used to meet the Regulation D-2 ballast water discharge standards. Additionally, systems that involve active substances must receive IMO final approval on the basis of a review of the acceptability of the system and treated discharge regarding health and safety of the environment, ships, and ships' crews. Under the Convention, Administrations will approve only treatment systems shown to meet the IMO standard in land-based contexts consistent with loose IMO testing guidelines. Meanwhile, the United States EPA and USCG are developing proposed approaches to further vetting treatment systems, including the draft ETV guidelines, the Shipboard Technology Demonstration Program and proposed type approval protocols at the bench, land-based and ship scales to meet pending US biological and environmental performance requirements. Finally, a number of Great Lakes states have stepped forward with regulations to address ships visiting their waters. Irrespective of the applicable regulatory matrix (matrices), effective prevention of further ship-mediated invasions in the Great Lakes is dependent upon effective assessment of treatment performance at the front end of the approval process.

The Maritime Administration proposes to use GLRI 2010 appropriations on a project to support verification of performance of IMO-approved treatment systems and other promising treatment methods in controlled bench, land-based tests and ship-board freshwater tests using the GSI facilities and staff. The performance verification tests will lead to credible evaluation of :

- Most importantly and urgently, performance of these treatment systems in the freshwater context, and Great Lakes fresh water in particular,
- The upper end of treatment effectiveness if it exceeds the IMO standard; and generally
- Methods and interfacility consistency treatment validation exercises in the land- and ship-board context. In particular, land-based tests supported with these funds will help determine whether testing by a second facility using the methods and techniques currently under development in the US will result in similar findings of efficacy.

**Task 1. Re-Testing at a U.S. Freshwater Land-based Facility of IMO-Approved Technologies**

Milestones 3,4,5

There are 8 ballast treatment systems that have received IMO approval and/or Type Approval by some national administrations (though not the US) and are currently on the market, and several more are on the horizon. Two locations outside the United States (in the Netherlands and

Norway) to date have conducted the preponderance of the land-based tests in support of IMO approvals. There are several reasons why testing at these sites for purposes of IMO approval provides only limited information to United States regulatory agencies as they gear up to regulate domestically regarding potential treatment system performance in the Great Lakes:

- Neither European facility tests treatment systems in fresh water;
- BW discharge standards under discussion in the US, at both federal and state levels, include metrics two to three orders of magnitude stricter than the IMO standard, and it is not clear that the methods used to test systems in Europe are capable of evaluating the performance of systems in meeting standards more stringent than the IMO's; and
- Testing at these facilities is not subject to domestic transparency and oversight. One or two European facilities conducting IMO approval testing considers significant aspects of its protocols to be proprietary information and will not share them.

Two test facilities located in the United States are poised to conduct IMO-consistent tests, the Great Ships Initiative (GSI) facility in Duluth-Superior Harbor of Lake Superior and the Maritime Environmental Resource Center (MERC) facility in Baltimore Harbor. Both have been deemed acceptable sources of IMO test data by the German Administration, among other parties to the IMO Convention. Of these domestic facilities (and internationally), GSI is the only one that tests treatments for performance in fresh water. The Marad team will engage GSI in procuring and evaluating one or more IMO-approved treatment systems for reevaluation consistent with IMO and emerging ETV guidelines at a domestic freshwater land-based facility. The MARAD team will also provide support and coordinate with the U.S. Coast Guard for conducting its intercalibration project planned for 2010.

**Outcome: At least one (1) IMO-Approved Treatment System Evaluated in 2010 in a Domestic Freshwater Land-Based Ballast Water Treatment Testing Facility**

Milestone 6, 7  
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#### **Task 2. Support for STEP Application and Design Phases for Great Lakes vessels**

The Coast Guard is undertaking a Shipboard Technology Demonstration Program (STEP) to help validate ballast treatments on board ships in a systematic and intercomparable way. It requires ship owners to make applications for participation in the program. However, induction into the STEP program requires sophisticated effort in the area of technology selection, application preparation and the design of a proposed installation, along with implementation of the tests. Many ship owners in the Great Lakes are not equipped to undertake these tasks without significant assistance. Therefore, in coordination with the USCG, and drawing on GSI personnel and expertise, the Marad team will

- assist Great Lakes ship-owners in developing approval-ready applications to the STEP program including technology selection, data consolidation, and preparation of a proposed experimental design and testing protocols. (The U.S. Coast Guard will conduct the application technical review).

- once STEP applications receive preliminary approval from the USCG and transition to the Environmental Assessment phase, undertake the design phase for the installation of the treatment system aboard the candidate vessel. This will entail ship visits and close interaction with the vessel owner/operator.

Thus, MARAD GLRI funds for this project will be used for preliminary stages including application preparation, design work, and the installation of the technology aboard the vessel. (We believe the scientific testing will be funded by the USCG).

**Outcome: At least one (1) application, design package, and installation on a GL ship of a treatment system for STEP evaluation (this is predicated upon completion of USCG evaluations)**

**Task 3: Verifying Efficacy of Other Promising Technologies.** *Milestones 2, 3, 4, 5*

We also plan to conduct bench-scale, land-based and at-sea tests of systems that are under development or on the market, but not already IMO-approved or proposed for immediate consideration in the US Coast Guard STEP program. To that end, the testing will provide information to assist manufacturers and ship-owners in refining treatment systems for application to GL trades and ships, and/or completing dossiers for US Type Approval/USCG Certification. Bench-scale testing outcomes may include data related to disinfection by-products, residuals, and human and environmental toxicity testing. This information is critical for technology developers preparing FIFRA applications and supporting NEPA analyses. (This work will be conducted concurrent with the STEP application evaluations being conducted by the USCG in order to maximize output at the Great Lakes testing facilities as preparations are made for the transfer of the STEP technology to the candidate vessel and ensuing shipboard tests.)

**Outcome: Five (5) systems tested at the bench-scale and one (1) land-based facility and one (1) system aboard a vessel**

**Task 4: Land-Based Facility Upgrades to Insure Reliability of Testing Regimes** *Milestone #1*

The GSI land-based ballast water testing facility is emerging as one of the most capable globally, but it is in dire need of certain improvements to support continuous use throughout the testing season. It will also need upgrades to allow testing to standards like the Phase 2 standards in the USCG proposed rule, and various state regulations. Many of these needed improvements have become apparent only recently as the facility undertakes its initial IMO-consistent testing, and domestic guidelines continue to evolve. Therefore, MARAD will devote some of its funds for improvements at the facility deemed critical to safe and consistent testing operations. They include several upgrades to assure that there is no cross-contamination of organisms within tests and between tests, maximum throughput at the facility, efficient facility modifications, and worker safety. First on the list of these upgrades is hook-up from Montreal Pier where the facility is located to nearby city water and sewer systems. The hook-up is slightly complicated by the presence of a railroad thoroughfare between the facility and the city lines but is essential to continued operation. Other improvements include a mechanized retention tank cleaning

system, a retention tank sediment agitation system, a waste water containment structure, storm water management piping, power upgrades, monitoring mechanisms to evaluate operational requirements of test systems, and worker safety upgrades for facilitate technician movement about and within the piping matrix of the facility. (It is anticipated that USCG funds will be used for those facility upgrades required to support ETV-consistent testing. ETV requirements exceed the level of upgrade that MARAD will provide.)

**Output: GSI Land-based test facility capacity to accurately, efficiently and safely assess treatment performance.**