

August 11, 2005



# Acquisition

Contract Award and Administration  
for the Improved Navy Lighterage  
System  
(D-2005-098)

Department of Defense  
Office of the Inspector General

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# Report Documentation Page

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### **Acronyms**

DCMA	Defense Contract Management Agency
INLS	Improved Navy Lighterage System
JMLS	Joint Modular Lighterage System
NAVFAC	Naval Facilities Engineering Command



INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
ARLINGTON, VIRGINIA 22202-4704

August 11, 2005

MEMORANDUM FOR NAVAL INSPECTOR GENERAL  
DIRECTOR, DEFENSE CONTRACT MANAGEMENT  
AGENCY

SUBJECT: Report on Contract Award and Administration for the Improved Navy  
Lighterage System (Report No. D-2005-098)

We are providing this report for information and use. This report is the second and last report of audits performed in response to a congressional request and allegations made to the Defense Hotline from one complainant. No written response was required, and none was received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the staff. For additional information on this report, please contact Ms. Kimberley A. Caprio at (703) 604-9202 (DSN 664-9202) or Mr. Benjamin A. Mehlman at (703) 604-9291 (DSN 664-9291). See Appendix C for the report distribution. The team members are listed inside the back cover.

By direction of the Deputy Inspector General for Auditing:

A handwritten signature in black ink that reads "Richard B. Jolliffe".

Richard B. Jolliffe  
Assistant Inspector General  
for Contract Management

## Department of Defense Office of Inspector General

Report No. D-2005-098

August 11, 2005

(Project No. D2004-D000CB-0208.000)

### Contract Award and Administration for the Improved Navy Lighterage System

#### Executive Summary

**Who Should Read This Report and Why?** DoD, contractor, and public officials and personnel with interest in the Improved Navy Lighterage System and related modular systems should read this report. The report addresses reliability and safety issues as well as contract award and administration relating to the Improved Navy Lighterage System.

**Background.** This report is the second and last report of audits performed in response to a request from Senator Pete V. Domenici and allegations made to the Defense Hotline from one complainant. The first report addressed allegations relating to the Army Modular Causeway System. This report addresses 12 allegations relating to the Improved Navy Lighterage System. The allegations stated that the Navy based a key Improved Navy Lighterage System component, the “side connector,” on a faulty, unreliable, and unsafe design. In addition, the allegations stated that the procuring activity, the Naval Facilities Engineering Command, cultivated an uncompetitive contracting process, and the Defense Contract Management Agency failed to manage the Improved Navy Lighterage System contracts.

From August through October 2003, the Naval Facilities Engineering Command awarded two contracts related to the Improved Navy Lighterage System, one for the procurement of the system modules and one for the procurement of the system side connectors for a total of \$413 million. First article testing of the Improved Navy Lighterage System side connector was performed from June through September 2004. Operational evaluation testing for the Improved Navy Lighterage System is scheduled to begin February 2006.

**Results.** We did not substantiate seven allegations regarding the Improved Navy Lighterage System side connector design, reliability, and safety. We also did not substantiate five allegations regarding the Naval Facilities Engineering Command contract award or the Defense Contract Management Agency management of the Improved Navy Lighterage System contracts.

**Management Comments.** We provided a draft of this report on June 15, 2005. No written response to this report was required, and none was received. Therefore, we are publishing this report in final form.

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## Background

This report is the second of two reports resulting from a congressional request from Senator Pete V. Domenici and allegations made to the Defense Hotline. The allegations relate to the acquisition of the Improved Navy Lighterage System (INLS). The INLS is a floating pier that comprises powered and nonpowered floating platforms assembled from interchangeable modules. The INLS is used to transfer cargo from sealift ships to shore areas where conventional port facilities may be damaged, inadequate, or nonexistent.

The allegations stated that a key component, the INLS connector (side connector), was based on a faulty, unreliable, and unsafe design. In addition, the allegations stated that the procuring activity, the Naval Facilities Engineering Command (NAVFAC), cultivated an uncompetitive contracting process, and Defense Contract Management Agency (DCMA) failed to manage the INLS contracts.

**Improved Navy Lighterage System.** The INLS program was developed as a result of the Joint (Army and Navy) Modular Lighterage System (JMLS) Advanced Concept Technology Demonstration program that took place from 1997 through 2000. The JMLS was to provide configurable platforms to move supplies and equipment from ship to ship and from ship to shore. The Advanced Concept Technology Demonstration program tested and analyzed the JMLS platforms and concluded the JMLS would not meet Navy “logistics-over-the-shore” requirements.<sup>1</sup> In August 2001, the Army decided to withdraw from the program. NAVFAC investigated improvements to the JMLS, and starting in September 2002, proceeded under the INLS name.

The INLS consists of four platforms: roll-on roll-off discharge facility, causeway ferry, floating causeway, and warping tug. Each platform comprises a group of interoperable and interchangeable floating modules. The INLS side connector is used to connect modules to create the two subsystems: roll-on roll-off discharge facility and floating causeway. The following picture depicts an INLS side connector. See Appendix B for more information on the four INLS platforms.

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<sup>1</sup> The Navy “logistics-over-the-shore” is the loading and unloading of ships without the benefit of fixed port facilities in either friendly or undefended territory, and in time of war, during phases of theatre development.



**INLS Side Connector**

**INLS Program Management.** The NAVFAC Sealift Support Program Office is the INLS program manager responsible for day-to-day management of the INLS program and oversight at the INLS contractor's facility. DCMA was responsible for the materiel inspection and acceptance for NAVFAC from the INLS side connector contractor and for administrative functions on both INLS contracts.

**INLS Contracts.** NAVFAC awarded two contracts related to the INLS: one for the procurement of the INLS platforms and one for the procurement of the INLS side connectors.

- On August 12, 2003, NAVFAC awarded a firm-fixed-price contract (N00025-03-C-0002) for a base year and up to four option years to Marinette Marine Corporation, Marinette, Wisconsin, for \$404,815,320 for procurement of the INLS platforms.
- On October 2, 2003, NAVFAC awarded a firm-fixed-price contract (N00025-03-C-0001) for a base year plus up to 5 option periods to Oldenburg Lake Shore, Inc., Kingsford, Michigan, for \$7,998,986 for procurement of up to 159 side connectors and eighteen 20-foot containers for storage and shipping the side connectors.
- On February 23, 2004, NAVFAC issued engineering change proposal number 001 (N00025-03-C-0001 modification P00005) to Oldenburg Lake Shore for \$136,432. The engineering change proposal added a remote control station cart to the INLS crew shelter, which automated the locking and unlocking of the side connector. Modification P00005 also reduced the amount of side connectors procured from 159 to 144 and added 6 remote control station carts.
- On August 27, 2004, NAVFAC issued engineering change proposal number 002 (N00025-03-C-0001 modification P00009) to Oldenburg Lake Shore for \$14,425. The engineering change proposal replaced side connector antifouling paint with an inorganic zinc paint to better guard against marine growth and corrosion.

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**First Article Testing.** On October 8, 2004, Oldenburg Lake Shore provided to NAVFAC a contractually required report summarizing INLS side connector first article testing performed from June through September 2004. First article testing included acceptance testing of the side connector first production unit, which included checking the quality and measurement of the welding to ensure the welding was within the tolerance, and testing of connector assembly and associated operating component functional requirements. First article testing also included an immersion test of the side connector in salt water.

**Operational Evaluation.** NAVFAC will begin operational evaluation testing on the INLS in February 2006. NAVFAC delayed the operational evaluation, originally scheduled for third quarter FY 2005 completion, due to logistical problems (iced-over INLS modules at the Marinette Marine, Wisconsin testing location) and schedule delays in INLS fabrication. NAVFAC expects INLS full-rate production to commence in the fourth quarter FY 2006 upon operational evaluation completion and approval. NAVFAC program officials stated that they are trying to mitigate time delays and maintain the full operational deployment date of the system for November 2009.

## Objectives

Our overall audit objective was to determine whether the Navy and DCMA properly followed contract award and administration policies and procedures for acquisition of the INLS. Specifically, we evaluated the allegations that the Navy based the INLS side connector component on a faulty, unreliable, and unsafe design; that the Navy procuring activity cultivated an uncompetitive contracting process; and that DCMA failed to manage INLS contracts. See Appendix A for a discussion of the scope and methodology and for prior coverage related to the objectives.

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## Improved Navy Lighterage System Side Connector Allegations

We did not substantiate allegations regarding the INLS side connector. Specifically, we did not substantiate the allegations regarding:

- the design, reliability, and safety of the side connector used to fasten together INLS components;
- the contract award; and
- the DCMA management of INLS contracts.

We did not substantiate the allegations because of technological improvements with the INLS side connector and a fair and competitive contract award and administration process.

### Allegations Related to the INLS

The complainant identified numerous allegations that stated that the side connectors used to fasten components of the INLS were based on a faulty design and were unreliable and unsafe. The complainant also alleged that the procuring activity cultivated an uncompetitive contracting process and that DCMA failed to manage the INLS contracts. We consolidated the allegations into three categories: side connector design, reliability, and safety; contract award; and management of the INLS contracts.

#### INLS Side Connector Design, Reliability, and Safety

Seven allegations related to the INLS side connectors design, reliability, and safety. We did not substantiate any of the seven allegations. See below for the specific allegations.

**Faulty Design Allegation.** The allegation stated that the INLS side connector originated from a failed JMLS cam and ball connector and contained over 1,000 parts that could lead to connector failure.

**Audit Results.** We did not substantiate the allegation. The cam and ball was a component of the JMLS connector, and the cam and ball required manual connection to activate the connection. When the Navy discontinued the JMLS program and initiated the INLS program, the Navy replaced the cam and ball configuration with a hydraulic system. The Navy replaced the cam and ball configuration because the operational requirements document required the INLS to be capable of meeting force projections and sustainment requirements in environments greater than “Sea State 2” for the movement of cargo to and from commercial and strategic sealift ships. The operational requirements document defined Sea State 2 as wave heights from 1.5 to 3 feet and wind speeds ranging

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from 5 to 12.6 knots. NAVFAC included the hydraulic configuration requirement in the INLS side connector solicitation to meet the sea state requirement.

On February 23, 2004, NAVFAC contract N00025-03-C-0001 modification P00005 revised the design of the INLS side connector from a manual locking system to a faster automated locking system. The INLS side connector included less than 100 parts, not 1,000 parts as alleged.

**Side Connector Tolerances Allegation.** The allegation stated the INLS side connector would not maintain tolerance of locking components and would not connect properly to INLS platform modules, thereby leading to frequent maintenance.

**Audit Results.** We did not substantiate the allegation. The solicitation established tolerance requirements as part of the testing process. Oldenburg Lake Shore requested and NAVFAC approved engineering change proposal number 001 (N00025-03-C-0001 modification P00005) revising the side connector to an automated operation device that will help stabilize the INLS platform faster during the connection process to prevent side connector tolerance loss.

NAVFAC program officials stated that sealift ships will perform maintenance checks every 3 years on the INLS in addition to annual technical inspections. NAVFAC and the Oldenburg Lake Shore completed first article testing of the side connector weld requirements in June 2004; the first article test report noted that welds were within tolerance requirements. In addition, DCMA noted in its acceptance inspection of contractor connector delivery that the contractor met all connector tolerance requirements. NAVFAC program officials stated that INLS contractors compensated for potential tolerance distortions during the welding process.

**Side Connector Life-Cycle Costs Allegation.** The allegation stated that the Navy would incur combined side connector life-cycle costs of approximately \$400 million.

**Audit Results.** We did not substantiate the allegation. The NAVFAC program office estimated the total INLS life-cycle costs to be \$665.5 to \$732.1 million. The total life-cycle cost consisted of research, development, test and evaluation, procurement, and operation and support of all INLS components. We calculated that the side connector represented only a small portion of the INLS procurement: about 2 percent of the total initial procurement cost of approximately \$413 million. NAVFAC did not keep separate life-cycle costs on the side connector because the connector was Government-furnished equipment provided to the INLS contractor. We concluded that side connector life-cycle costs would not likely exceed a proportionate 2 percent amount of INLS life-cycle costs; thus

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no more than \$13.3 to \$14.6 million.<sup>2</sup> The complainant could not provide support for the claimed side connector life-cycle cost cited in the allegation.

**Use of Heavy Greases Allegation.** The allegation stated that the side connectors used heavy greases and hydraulic oils that were harmful to the marine environment.

**Audit Results.** We did not substantiate the allegation. The side connector does not operate using heavy greases that are harmful to the marine environment.<sup>3</sup> The side connector uses hydraulic oil during operation. Each side connector holds approximately 1 and 1.5 gallons of hydraulic oil. NAVFAC and the side connector contractor have taken a number of steps to minimize oil leaks that could harm the marine environment. Specifically, the NAVFAC design engineer stated that the hydraulic fluid is “self-contained” in the side connector hydraulic cylinders and is maintained by high-pressure tubing and connections. During first article testing, the hydraulic cylinder was successfully hydro-tested at 1.5 times the normal operating pressure. In addition, Oldenburg Lake Shore has mitigated oil leaks by designing zero-leak fittings and a check valve inside the connector to stop leaks. Also, an “Emergency Stop” button allows operational personnel to shut off power to the connector hydraulic power unit if leaks are noticeable.

**Use of Side Connectors in Salt Water Allegation.** The allegation stated that the side connector was not appropriate for use in salt water and was not adequate to protect against corrosion, fouling, and marine growth.

**Audit Results.** We did not substantiate the allegation. A NAVFAC-approved engineering change replaced connector antifouling paint with an inorganic zinc paint to better guard against marine growth and corrosion. Oldenburg Lake Shore completed an environmental saltwater immersion test in September 2004. The submerged prototype connector was in a saline solution representative of ocean water. After the immersion period, disassembly of the connector revealed spots of corrosion, but only where inorganic zinc paint was not applied. NAVFAC program officials stated that any potential corrosion will be resolved in subsequent production cycles by applying inorganic zinc paint prior to fabrication of the side connector at no additional cost.

**Side Connector Assembly and Disassembly Allegation.** The allegation stated that the side connectors were unsafe to assemble or disassemble in water and would require the use of cranes and forklifts that increase the risk of injury to sailors.

**Audit Results.** We did not substantiate the allegation. The NAVFAC program officials stated that the Navy uses cranes and forklifts on shore to assemble or

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<sup>2</sup> NAVFAC awarded the INLS side connector contract for \$7,998,986, and the INLS contract for \$404,815,320, for a total INLS procurement of \$412,814,306. Dividing the INLS side connector procurement of \$7,998,986 by the total INLS procurement of \$412,814,306 resulted in approximately 2 percent of the total INLS procurement. Multiplying the estimated total INLS life-cycle costs of \$665.5 to \$732.1 million by 2 percent resulted in a proportionate amount of \$13.3 to \$14.6 million.

<sup>3</sup> The side connector engagement bullets ride in a LUBRON sleeve, a permanently lubricated bearing designed for submerged use in a marine environment.

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disassemble the side connectors. When INLS module assembly is required at sea, INLS operators would use the remote control station cart to perform automated locking and unlocking of the side connector, thus mitigating risk of injury to sailors during the connection process.

**INLS Module Components Allegation.** The allegation stated that INLS module sides and “slots” were hazardous, had sharp edges, and would catch on piers. The allegation also stated that corrective “slot closures”<sup>4</sup> would be a safety risk to install or remove.

**Audit Results.** We did not substantiate the allegation. We observed at the Marinette Marine facility that the slot closures covered the module side slots on the INLS to prevent hazardous conditions and were not a safety risk to install or remove.

## **Contract Award**

Three allegations related to the INLS contract award. Specifically, the allegations claimed that NAVFAC was cultivating an uncompetitive contracting process. We did not substantiate any of the three allegations and found no indication that the contracting process was uncompetitive. The specific allegations are discussed below.

**Government Assumption of Risk Allegation.** The allegation stated that the Government inappropriately assumed total risk for the design of the INLS side connector because the side connector was built under one contract while the side connector pockets were built under a separate contract.

**Audit Results.** We did not substantiate the allegation. The Government assumed appropriate risk for the design of the INLS side connector. The NAVFAC Sealift Support Program Office awarded the INLS side connector and the INLS modules under separate contracts and contractors. NAVFAC program officials believed risk would be greater if one contractor designed both the INLS side connector and the INLS modules. NAVFAC program officials also stated that it was in the best interest of and less risky for the Government to develop and procure the side connectors, and provide them as Government-furnished equipment to the prime contractor to facilitate assembly tests.

The separate design and procurement of the INLS side connector mitigated many of the technical risks associated with the detail design and construction of the low-rate initial production units. By breaking out the side connector procurement, NAVFAC reduced technical risk by removing the unique component that was not part of a normal barge construction effort. The NAVFAC acquisition strategy noted that the INLS side connector was only required for side connection of the roll-on roll-off discharge facility and the floating causeway platforms; to preserve the procurement schedule, the design and manufacturing of the INLS side connector was separated from the overall INLS procurement.

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<sup>4</sup> Slot closures are caps that cover the end points of the unattached portions of the INLS modules.

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**NAVFAC INLS Design Selection Allegation.** The allegation stated that NAVFAC selected a side connector design only to favor a particular contractor and had no intention of making an evaluation of the best INLS side connector.

**Audit Results.** We did not substantiate the allegation. The NAVFAC methods to evaluate INLS side connector proposals used full and open competitive procedures and consisted of one solicitation with the intent to award one firm-fixed-price contract for the INLS side connector.

In response to the solicitation, the NAVFAC Sealift Support Program Office received seven proposals for the INLS side connector contract. The solicitation stated that the proposals were to be evaluated on technical evaluation factors and price. The technical evaluation factors were manufacturing capabilities, management approach, past performance, and small business subcontracting plan. The technical evaluation factors were considered of equal importance, and when combined were considered significantly more important than price. The technical evaluation board used a five-rating scale ranging from “outstanding” (the proposal met the fullest expectations of the Government and contained no weaknesses or deficiencies), “excellent” (the proposal was fully responsive with no significant deficiencies), “good” (the proposal was adequately responsive with minor deficiencies), “marginal” (the proposal contained weaknesses in several areas and moderate risk that the contractor would not be successful), to “poor” (the proposal did not address specific factors).

Based on the technical evaluation board and cost board findings, the source selection board determined that three potential contractors (Bidders A, B, and C) were in the competitive range. The technical evaluation board evaluated the remaining three bidders based on four technical evaluation factors. The technical evaluation board rated the overall technical evaluations of Bidders B and C as “outstanding,” while Bidder A’s overall technical evaluation was rated “excellent.” Therefore, the deciding evaluation factor was price. NAVFAC awarded the INLS side connector contract to Bidder C, Oldenburg Lake Shore, based on the best value to the Government. Based on review of the source selection documents, NAVFAC consistently applied the source selection criteria in awarding the INLS side connector contract to Oldenburg Lake Shore.

**NAVFAC Side Connector Selection Allegation.** The allegation stated that NAVFAC chose to use an inappropriate INLS side connector.

**Audit Results.** We did not substantiate the allegation. NAVFAC chose to use the Government-furnished design for the INLS side connector. The NAVFAC selection of an INLS design did not favor any particular contractor. Rather, the INLS side connector was designed by the Naval Surface Warfare Center, Carderock Division, Maryland. The Center maintains a Government patent on the INLS side connector design.

Oldenburg Lake Shore was contractually required to fabricate side connectors for the INLS at the Oldenburg Lake Shore facility in accordance with Government-approved drawings. However, the contractor was permitted to make improvements in the side connector with Government approval through an engineering change proposal process. The NAVFAC program office issued two

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engineering change proposals to the side connector contractor. Engineering change proposal 001 (N00025-03-C-0001, modification P00005) changed the manual locking and unlocking of the INLS side connector to an automated locking and unlocking system with the use of a remote control station cart. Engineering change proposal 002 (N00025-03-C-0001, modification P00009) changed the use from antifouling paint to inorganic zinc paint on the INLS side connector.

## **DCMA Management of INLS Contracts**

The NAVFAC contracting officer required DCMA to perform contract administration functions for INLS contracts, N00025-03-C-0001 and N00025-03-C-0002, including engineering surveillance to assess compliance with contractual terms for schedule, cost, and technical performance in the areas of design, development, and production. The NAVFAC contracting officer also required DCMA to perform quality assurance functions for the two contracts. DCMA audits, inspection logs, inspection and acceptance reports, and other related documents demonstrated that DCMA adequately performed its oversight duties of the contractors' work.

Two primary allegations related to DCMA management of the INLS contract number N00025-03-C-0002. We did not substantiate either allegation. The specific allegations are discussed below.

**DCMA Oversight of Connector Pocket Machining Allegation.** The allegation stated that DCMA permitted Marinette Marine Corporation to machine connector pockets prior to fabrication. The complainant claimed that a machining before fabrication process would save the contractor about \$50 million on its fixed-price contract.

**Audit Results.** We did not substantiate the allegation. DCMA was responsible for materiel inspection. The INLS contract solicitation required potential contractors to perform detailed design and production in accordance with system specifications. The solicitation required the contractor to prepare a complete set of production drawings and design calculations necessary for production of the system, with emphasis on minimizing operating costs. However, the solicitation did not specifically require machining connector pockets after fabrication. According to the DCMA quality assurance personnel, machining prior to fabrication involves machining metal in smaller pieces, which is less expensive. In addition, Marinette officials stated that having the ability to machine the INLS module components before fabrication provided the company with a technological advantage in the market place. The complainant could not provide support for the alleged \$50 million savings.

**DCMA Review of INLS Connector Tolerance Requirements Allegation.** The allegation stated that DCMA allowed Marinette Marine Corporation to be out of compliance with the contract drawings regarding connector pocket tolerances.

**Audit Results.** We did not substantiate the allegation. DCMA monitored contractor performance and performed general inspections and quality assurance

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reviews as required. DCMA verified and inspected INLS equipment to ensure compliance with contract specifications. In addition, as a part of the audit, a DoD Office of Inspector General engineer conducted a review of the INLS platform and concluded no tolerance problem existed.

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## Appendix A. Scope and Methodology

We performed this audit to examine allegations made to the Defense Hotline and in response to a congressional request made by Senator Pete V. Domenici that the INLS side connector component was based on a faulty design and had reliability and safety issues. Additional allegations were that the procuring activity, NAVFAC, cultivated an uncompetitive contracting process, and that DCMA failed to manage INLS contracts.

We collected, reviewed, and analyzed documents dated from July 1977 through April 2005. Specifically, we evaluated INLS contract actions, including contract documents and modifications, engineering change proposals, related solicitations, source selection plans, technical evaluation board documents, pre- and post-negotiation memorandums, price analyses, and price evaluation reports.

We reviewed applicable contracting regulations including the Federal Acquisition Regulation, the Defense Federal Acquisition Regulation Supplement, Naval Facilities Acquisition Supplement, Navy Acquisition Procedures Supplement, and the Defense Logistics Agency Regulation.

We also reviewed selected INLS-related technical manuals including the INLS Specification, Test and Evaluation Master Plan, Operational Requirements Document, Acquisition Strategy Plan, Acquisition Logistics Support Plan, and First Article Test reports. We also reviewed DCMA materiel inspections and receiving reports, and other technical and programmatic reports and documents.

We interviewed personnel from NAVFAC, Naval Surface Warfare Center, DCMA, and contractors responsible for the INLS program as well as the complainant to obtain clarification of the Defense Hotline allegations.

We performed this audit from July 2004 through May 2005 in accordance with generally accepted Government auditing standards. The audit scope was limited to the allegations made on INLS contracts and did not include a review of the management control program.

**Use of Computer-Processed Data.** We did not use computer-processed data to perform this audit.

**Use of Technical Assistance.** We obtained assistance from a mechanical engineer of the Mechanical Engineering Branch, Technical Assessment Division, Office of Inspector General to assist the auditors in understanding the technical requirements for the material and function of the side connector, as well as determining whether Navy contractors provided a system that met specifications and functions outlined in the contract.

**Government Accountability Office High-Risk Area.** The Government Accountability Office has identified several high-risk areas in DoD. This report provides coverage of the DoD Contract Management high-risk area.

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## **Prior Coverage**

During the last 5 years, the DoD Inspector General (DoD IG) has issued one report on related allegations pertaining to the Army's Modular Causeway System, and two reports discussing Government source inspections and Government acceptance procedures for contractor parts. Unrestricted DoD IG reports can be accessed at <http://www.dodig.mil/audit/reports>.

## **DoD IG**

DoD IG Report No. D-2005-021, "Contract Award and Administration for Modular Causeway Systems," November 22, 2004

DoD IG Report No. D-2004-011, "Government Source Inspections," October 15, 2003

DoD IG Report No. D-2003-065, "Allegations Concerning Government Acceptance Procedures for a Contractor's Parts," March 21, 2003

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## Appendix B. Improved Navy Lighterage System Components

The INLS is a collection of interoperable and interchangeable components that is the primary means for the Navy to transfer cargo from strategic sealift ships to shore areas where conventional port facilities may be damaged, inadequate, or nonexistent. The INLS consists of powered and nonpowered floating modules and barges that can be assembled into the following four platforms:

- the roll-on roll-off discharge facility, which supports the discharge ramp from the cargo ship and serves as a pier to transfer rolling stock to a barge;
- the floating causeway, which supports the discharge ramp from the cargo ship and transfers rolling stock across undeveloped shoreline;
- the causeway ferry, which is used to transport cargo from ship to shore or to the floating causeway.
- the warping tug, which is used for assembling, towing, anchoring, and salvaging operations; and

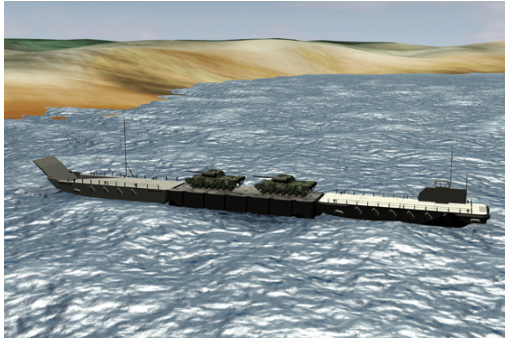
See Figures 1 through 4 for pictures of each of the INLS platforms.



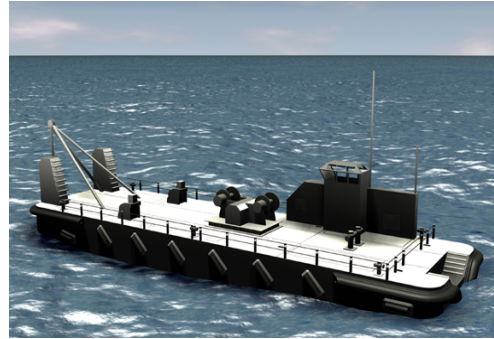
**Figure 1. Roll-On Roll-Off Discharge Facility**



**Figure 2. Floating Causeway**



**Figure 3. Causeway Ferry**



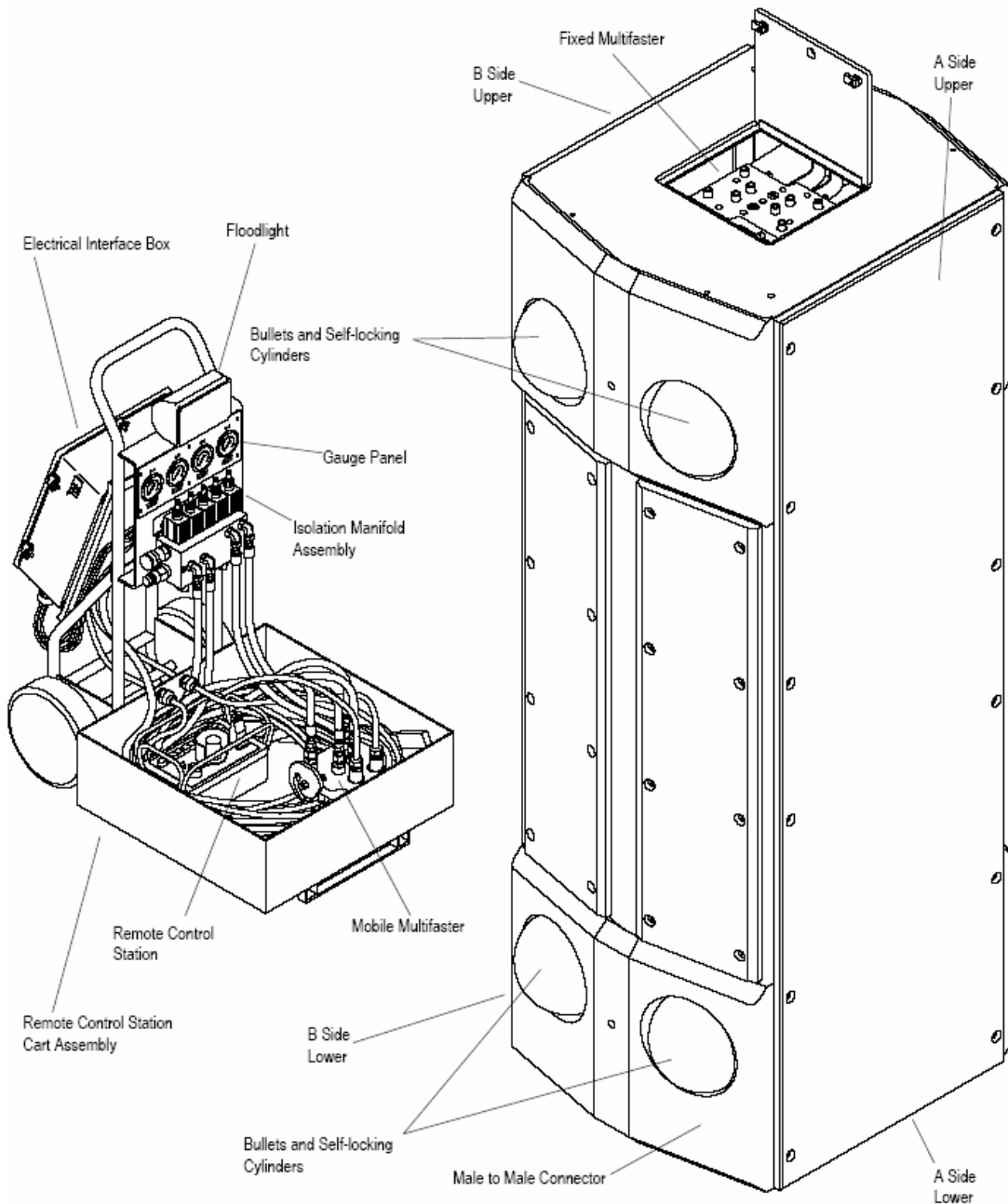
**Figure 4. Warping Tug**

INLS side connectors connect the individual modules or barges that make up the roll-on roll-off discharge facility and the floating causeway. The side connector is a two-trapezoidal box structure that houses eight bullets at top and bottom for connection. These eight bullets work in pairs and move inward or outward by hydraulic cylinders with controls at the topside of the connector. Each bullet engages with a female socket that conforms to the shape of the bullet. The female sockets are installed on the combination module. The objective is to use four side connectors holding together, side-to-side, two combination modules. For each connector, all eight bullets engage the female sockets to form a rigid joint. The hydraulic power is supplied by flexible quick disconnect hoses that connect to the top of the side connectors.

The side connector system receives its power (hydraulic and electric) from the containerized crew shelter. The remote control station cart connects to the crew shelter by two hydraulic hoses, an electrical power cable, and an electrical control cable. The remote control station cart interfaces with and controls the side connectors.

The remote control station cart is a single structure allowing for mounting of remote hydraulic power unit components and assemblies. The cart includes an electrical enclosure mount to house the proportional valve driver card and control circuitry. The manifold includes an electrically operated valve with manual override that provides for circulation of oil for purging air or warm-up.

The remote control station, located on the remote control station cart, incorporates all electrical controls and gauges for use by the operator. The remote control station provides for operation and monitoring by one operator, is portable, and interfaces to the cart through a flexible interface cable no longer than 10 feet in length. The remote control station cart interfaces with the side connector by using a multifaster connector that engages the four hydraulic lines and any electrical control wires in one effort. A remote control station indicator light shows that the hydraulic power unit is operating and that the bullets are engaged. See Figure 5 for a picture of the INLS side connector system.



**Figure 5. INLS Side Connector System and Remote Control Station Cart**

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## **Appendix C. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense (Comptroller)/Chief Financial Officer  
Deputy Chief Financial Officer  
Deputy Comptroller (Program/Budget)  
Director, Program Analysis and Evaluation

### **Department of the Army**

Auditor General, Department of the Army

### **Department of the Navy**

Naval Inspector General  
Auditor General, Department of the Navy  
Naval Facilities Engineering Command

### **Department of the Air Force**

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### **Other Defense Organizations**

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### **Non-Defense Federal Organization**

Office of Management and Budget

### **Congressional Committees and Subcommittees, Chairman and Ranking Minority Member**

Senate Committee on Appropriations  
Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Homeland Security and Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on Defense, Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Reform  
House Subcommittee on Government Efficiency and Financial Management, Committee on Government Reform

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**Congressional Committees and Subcommittees, Chairman and  
Ranking Minority Member (cont'd)**

House Subcommittee on National Security, Emerging Threats, and International  
Relations, Committee on Government Reform

House Subcommittee on Technology, Information Policy, Intergovernmental Relations,  
and the Census, Committee on Government Reform

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