

**Chief of Naval Operations
Afloat Environmental Quality Award Narrative
for USS EMORY S LAND (AS 39)**



1. **Introduction.** USS EMORY S LAND (AS 39) (ESL) is a forward deployed submarine tender whose primary mission is to provide intermediate maintenance repair to FIFTH and SEVENTH Fleet submarines and ships. ESL is manned by a hybrid crew of approximately 250 Sailors and 150 Civilian Mariners. The vessel is homeported in the pristine waters surrounding Diego Garcia, located in the British Indian Ocean Territory.

2. **Background**

2.1 **Environmental Challenges**

2.1.1 Throughout fiscal year (FY) 2015, ESL operated in a vast number of international locations with limited environmental support infrastructure and therefore was faced with complex, stringent environmental regulations when compared against other Naval vessels. ESL was underway for 64 days out of the 365 days away from its homeport; in which, the ship safely steamed over 14,000 nautical miles and conducted six port calls in Oregon, Hawaii, Guam, Thailand, Malaysia and Philippines. As a floating industrial shipyard, ESL efficiently conducted maintenance availabilities for 14 submarines and 6 surface ships, totaling more than 1,100 jobs and 45,000 man-hours of production work. Moreover, the 36-year old ship underwent two voyage repairs and an arduous four month, depot-level docking phased maintenance availability (DPMA) in a high hazard industrial shipyard. Photographs in Figure 1 were taken during the DPMA and afterwards tending 9 submarine and conducting an underway replenishment.



Figure 1. USS EMORY S LAND (AS 39) in Action

2.1.2 Environmental compliance was of keen interest to local governments. Perceptions of non-compliance can potentially trigger international attention and concern. Considering ESL's extreme operational tempo and high risk activities, the command's

intense focus on environmental readiness resulted in an unprecedented zero report of harmful or detrimental impacts to the environment. The environmentally-sound vessel satisfied environmental requirements, experienced no adverse environmental mishaps, minimized air emissions and hazardous material usage during all repair efforts, limited dependence on shore facilities for waste off-load and fuel on-load and reduced logistical costs for waste management.

2.1.3 To ensure full compliance with both U.S. and host nation environmental policies, an aggressive phased approach is utilized that begins with comprehensive review of requirements, a thorough analysis of risk and development of mitigation strategies. Once this phase is complete, a detailed pre-evaluation brief is conducted to ensure all personnel involved in the evolution have complete appreciation of both the environmental concerns and the plans to avoid a mishap. This routine coupled with periodic self-assessments, has ensured that the ship's work practices protect the fragile environment.

2.2 Environmental Management, Organization and Staffing

2.2.1 Environmental stewardship is shared by all hands aboard ESL. The Commanding Officer is the environmental on-scene commander at sea, and the Command Duty Officer is responsible for environmental compliance efforts inport. The ship's Industrial Hygiene Officer (IHO), designated as the Afloat Environmental Protection Coordinator (AEPC), prepares and ensures compliance with adopted environmental policies and advises the Commanding Officer on potential environmental impacts. The IHO maintains a secondary subspecialty as an Environmental Health Officer and holds the Registered Environmental Health Specialist/Registered Sanitarian credential, the gold standard in the environmental health field.

2.2.2 The Chief Mate, as the ship's primary AEPC, oversees deck, engineering and supply services and ensures operations comply with environmental regulations. He regularly inspects machinery for efficient operation in order to minimize or eliminate potential environmental impacts. The Chief Engineer is responsible for the oil pollution abatement and marine sanitation system; whereas, the Supply Officer and Cargo Mate manage the solid and hazardous waste management plans. Leadership ensures waste is handled safely and that qualifications of Civilian Mariners (CIVMARS) are current and command commitment translates into action.

2.3 **Environmental Guidance, Directives and Plans.** The command's environmental guidance is properly maintained and easily accessible in the Safety Management System (SMS). The procedures, checklists and forms are reviewed annually, revised/updated as needed and current with higher guidance. Table 1 lists SMS procedures (with most recent published dates) tailored to ESL operations.

Table 1. SMS Procedures

Document	Title	Date
2.2-001-ALL	Air Emissions	9 Apr 2015
2.2-002-ALL	Marine Life Protection	9 Apr 2015
2.2-003-ALL	Ballast Water Management	9 Apr 2015
2.2-005-ALL	Sewage and Gray Water Management	9 Apr 2015
2.2-008-ALL	Hazardous Material Handling	9 Dec 2014
2.2-016-ALL	Shipboard Garbage Management	9 Apr 2015
2.4-002-ALL	Potable Water	7 Oct 2014
2.4-005-ALL	Handling/Disposal of Medical Waste	27 May 2014
7.4-002-ALL	Used Oil and Oily Waste	20 Dec 2013
7.4-009-ALL	Shipboard Oil Pollution Prevention	9 Apr 2015
8.18-001-SQ	OHS Spill Response	9 Apr 2015

3. Program Summary

3.1 Environmental Program and Compliance. The command has complied with OPNAV M-5090.1 during the past fiscal year. ESL was able to operate with minimal regulatory constraints, no inappropriate dependence on shore facilities and no unreasonable costs imposed by environmental regulations. The AEPCs conducted an annual environmental program self-evaluation for compliance of procedures, practices and training using 12.1-001-04-ALL *Environmental Self-assessment Checklist*. Additionally, an initial environmental assessment using Appendix D *Afloat Environment Checklist* of OPNAV M-5090.1 was accomplished in order to provide Commander Submarine Force, U.S. Pacific Fleet a means to quantitatively assess subordinate units' environmental-related equipment use, training and readiness. The internal environmental audits directly resulted in a successful Ship Material Assessment and Readiness Testing (SMART) inspection, scoring 98 percent in environmental readiness.

3.2 Most Outstanding Program Features

3.2.1 ESL maintained an impressive record of zero reportable fuel spills in FY 2015. This is no small feat in light of the above challenges and the exceptionally large volumes of fuel. More than two million gallons of diesel fuel, lube oil and waste oil was handled over the fiscal year in support of tended units. Furthermore, the submarine tender conducted an underway replenishment, transferring 340,000 gallons of fuel. The fuel on-load at sea eliminated the cost of fuel services and potential spills ashore.

3.2.2 ESL, simply by her assigned mission, has a larger associated hazardous waste stream than an equivalently sized ship. The ship off-loaded up to 40,000 pounds of hazardous material (HM) without a spill during port visits. Due to the lack of a shore-based Consolidated Hazardous Reutilization and Inventory Management Program or Defense Reutilization and Marketing Office services that are typical of large fleet concentrated areas, the Supply Department

adopted the Hazardous Inventory Control System for Windows (HICSWIN) Program. The ship's use of HICSWIN enabled reuse of 60 HM items for preventive maintenance, saving the Navy \$4,000 without the support of Naval shore facilities.

4. Accomplishments

4.1 **Air Pollution Control**

4.1.1 **Engine Emissions.** The Engineering Department monitored stack emissions while steaming underway. In coordinated port visits with submarine forces, ESL provided shore power and auxiliary steam. Soot blows were prohibited unless deemed necessary by the Chief Engineer. The Boiler Technician of the Watch closely observed stack emissions during boiler operations to ensure safe combustion.

4.1.2 **Refrigerant Use.** The Engineering Department successfully maintained three 250-ton air conditioning plants, three 8-ton ship service refrigeration units and numerous local package air conditioning units with zero percent release of freon. Additionally, all R-12 freon has been substituted with the more environmentally-friendly R-134A refrigerant for reefer compressors and R-236FA for air conditioning units.

4.1.3 **Volatile Organic Compound Releases.** The command has taken strides to restrict the release of volatile organic compounds (VOCs) with the Hazardous Materials Minimization Center (HAZMINCEN) establishment and restrictions on thinning marine coatings. The Supply Department restricts paint issue to only personnel who have completed requisite training, and the volume of paint issued is restricted to the volume needed. Moreover, local exhaust ventilation systems are strategically positioned at indoor work sites to minimize or eliminate VOC exposures and explosive hazards. The AEPC command education initiatives combined with aggressive auditing ensure compliance.

4.2 **Water Pollution Control**

4.2.1 **CHT System Management.** The Engineering Department maintains and operates five collection, holding and transfer tanks in accordance with the Sewage Disposal System Sequence. The Chief Engineer abides by the International Convention for the Prevention of Pollution from Ships requirements and has made it a practice to not discharge graywater or blackwater within 12 nautical miles of land. These efforts have prevented unsightly discharges into sensitive waters, often within or near popular seaside attractions.

4.2.2 **Oil and Hazardous Substance (OHS) Spill Prevention and Response.** ESL, unlike other Naval ships, is responsible for the port services function, which is normally provided by fleet activities.

Therefore, the command is required to maintain OHS spill control proficiency and equipment necessary to prevent or contain and remove OHS discharges. This has been accomplished by the OHS response team, comprising of 28 qualified CIVMARS, who receive extensive training and quarterly drills, resulting in many successful pier side replenishments.

4.2.3 Waste Oil Management. ESL handles a large amount of waste oil on a daily basis, primarily due to her repair mission. In FY 2015, the ship generated 150,000 gallons of oily waste. A submarine, on average, transferred 1,500 gallons of waste oil to the ship each day while alongside. The oily waste separator is fully operable and monitored by oil content monitors that are set at 15 parts per million of oil. These evolutions resulted in zero spills because of close supervision and planning by the Chief Engineer.

4.3 Solid Waste (SW) Management and Resource Recovery

4.3.1 SW Management. The ship's successful SW management program begins with proactive command wide education via command indoctrination and plan of the day notes. Garbage is segregated into paper, plastic and glass/metal waste containers and disposed using a paper pulper, glass and metal shredders and plastic waste processor. Approximately 48 cubic meters of food and domestic waste was discharged at sea, and roughly 1,500 cubic meters of plastic, food waste and domestic waste was turned over to reception shore facilities during FY 2015. The existing controls ensure the ship was 100 percent compliant and prevented the operational requirement for a single underway plastic waste discharge.

4.3.2 Source Reduction Techniques. The command employed effective source reduction techniques to reduce the amount of solid waste produced onboard. Examples include using electronic documents in lieu of printed materials; dual-sided printing; take-back provisions for packing materials; and purchasing items that are reusable, have extended service life, reduced packaging or recyclable packaging materials.

4.3.3 Resource Recovery and Recycling. ESL maximizes all efforts to recycle items, such as printer/toner cartridges and unused hazardous material, and to minimize the amount of metal and plastics carried onboard. Metal and plastic waste accounted for two percent of solid waste over the past fiscal year. All unused/excess hazardous material is identified monthly and reused onboard the vessel.

4.4 HM and Hazardous Waste (HW) Management. The ship contains seven HM storerooms, 22 satellite lockers and a HW accumulation point. These storage locations are inspected monthly by the HM Coordinator and Safety Officer for proper storage, the availability of required Safety Data Sheets and the accurate completion of inventories.

These efforts help reduce spill potential, as well as minimize disposal of expired shelf-life items. The Supply Department took an aggressive approach during FY 2015 to minimize the use of HM onboard by removing roughly 40,000 pounds of HM via HAZMINCEN.

4.5 Protective Measures Assessment Protocol (PMAP). The command utilizes PMAP prior to participating in any of the at-sea fleet training activities which have the potential to impact marine species and their habitat. The 6-man watch team attends the Marine Species Awareness Training on the PMAP website quarterly.

4.6 Sonar Positional Report System. Not applicable.

4.7 Environmental Awareness. In FY 2015, the ship's Chaplain and 48 Sailors volunteered over 200 hours in several community service events geared towards environmental renewal and revitalization. Events included Kaiser Park restoration project and Manenggnon River cleanup in Guam, Subic Bay and Dadi Beach cleanup in the Philippines and gardening in Portland, OR.

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a. The submarine tender efficiently conducted maintenance and repairs on 14 submarines and 6 surface ships, totaling more than 1,100 jobs and 45,000 man-hours with zero reports of any adverse environmental impacts.

b. The ship underwent two voyage repairs and an arduous 4-month docking phased maintenance availability while achieving the highest standards of environmental compliance and stewardship.

c. The vessel's aggressive hazardous material reutilization program reused 60 hazardous material items, saving the Navy over 4,000 dollars.

d. ESL's environmental readiness for the past 5 years was graded satisfactory (scoring 98 out of 100 percent) by the Ship Material Assessment and Readiness Testing Inspection Team.

2. ESL has developed a culture of both safety and environmental excellence that has been noted by the Chief of Naval Operations (CNO) and resulted in the ship winning the annual CNO Afloat Safety Excellence Award for the past three years. Safety is a top priority of the Commanding Officer, and the ship's environmental readiness is woven into the safety program's philosophy which is why it was equally successful.