USS ENTERPRISE (CVN 65) NOMINATION FOR THE 2011 SECRETARY OF THE NAVY / CHIEF OF NAVAL OPERATIONS ENVIRONMENTAL QUALITY—LARGE SHIP AWARD

1 **Introduction.** USS ENTERPRISE, the world's first nuclear powered aircraft carrier and U.S. national asset for 50 years, provides prompt, sustained combat operations from the sea while ensuring environmental stewardship through an exceptional Environmental Management Program. Home ported in Norfolk, Virginia, ENTERPRISE has a total crew complement of over 4,400 Sailors and Marines, which includes 3,100 ship's company and 1,300 air wing and staff personnel.

2 **Background**

2.1 The USS ENTERPRISE returned from its 21st deployment in July 2011. This was the culmination of a two-year Extended Dry Docking Selected Restricted Availability (EDSRA), two Fleet Replacement Squadron/Mobile Training Team 2 and 3 events, an Operational Reactor Safeguard Exam, and an Ammunition Onload. During the past two years, ENTERPRISE has operated at sea for 11 out of 24 months, completing a deployment in support of operations in 5th, 6th, and 7th fleets, including Operation ENDURING FREEDOM (OEF), Operation New Dawn (OND), and Operation Copper Dune (OCD). Additionally, ship's equipment and habitability have been maintained through the concept of a Continuous Maintenance Availability (CMA) with a near constant presence of shipyard workers anytime ENTERPRISE is in port and, when necessary, while at sea. This fast paced schedule, along with the advanced age of ENTERPRISE has created many Environmental challenges for the crew to overcome. With her keel laid in 1958, ENTERPRISE still contains large amounts of asbestos thermal insulation that, as portions of the distributive piping systems fail, must be removed in a safe and environmentally sound manner in order to affect repairs. The presence of lead-based paint poses an environmental health challenge requiring strict monitoring of all paint removal projects to ensure proper testing, in-process controls, clean up, and disposal methods are used. Additionally, with all of her original systems pre-dating the existence of the Environmental Protection Agency (EPA), ENTERPRISE has been modified and retrofitted over the years to comply with Federal Environmental Regulations. Many of these retrofits, while enabling the ship to meet the regulatory requirements, are manpower intensive, requiring constant monitoring and maintenance to ensure satisfactory performance.

2.2 The ENTERPRISE Environmental Management team is comprised of the Executive Officer as chairman, the Industrial Hygiene Officer as the Afloat Environmental Protection Coordinator, and the Safety Officer as recorder, with all other department heads as members. In addition to the above members, the Damage Control Assistant, Fire Marshall, and HAZMAT Division Officer attend and provide input regarding their specific areas of expertise. The Environmental Program is supported by a network of 85 Collateral Duty Safety Petty Officers. These Petty Officers attend monthly Enlisted Safety Council meetings where they receive training from the Safety Department on Best Management Practices, changes to applicable instructions, and NAVOSH programs. This training equips these Sailors with the knowledge needed to enforce environmental and safety policies throughout the ship.

2.3 Environmental program management and guidance is included in the following ENTERPRISE directives. Dates of last revision are listed in parentheses:

- Assignment to Primary and Collateral Duties, Notice 1301 (29 NOV 2010)
- Standing Orders for Underway Watches, 3505.1Q (27 FEB 2011)
- Air Department Standard Operating Procedures, 3100.2G (7 OCT 2009)
- Hazardous Material / Excess Hazardous Material Control and Management Program, 4425.2E (15 APR 2008)
- Zone Inspection Program, 4730.4P (01 FEB 2006)
- Shipboard Medical Waste Management Program, 5090.1B (2 JUN 2011)
- Shipboard Oil Spill Contingency Plan (SOSCP), 5090.2A (NOV 2011)
- Preservation and Maintenance Bill, 4750.2H (5 JUN 2011)
- Sanitation Bill, 6240.1H (12 NOV 2010)
- Gas-Free Engineering, Hot Work, and Cold Work Program, 9192.1J (20 SEP 2011)
- Hydraulic Fluid Safety Precautions, 9556.1C (22 DEC 2009)
- Exposure Control Programs for Blood Borne Pathogens, 6280.3A (2 JUN 2011)

3 Program Summary

3.1 Program Compliance. ENTERPRISE is committed to operating in an environmentally conscious manner and supporting Navy Environmental Program goals through the elimination and control of pollutants. To meet this end, environmental policy is integrated into applicable ship instructions and included in indoctrination, annual, and periodic safety-related training presentations. Quarterly audits of the program are conducted using all elements from Appendix K of OPNAVINST 5090.1C and checklists from the Board of Inspection and Survey (INSURV). Review of program requirements since completion of an Extended Dry Docking Selected Restricted Availability (EDSRA) in April 2010 and through the 2011 deployment has allowed the ENTERPRISE Environmental Management Team to maintain focus on program accountability. The success of this oversight is the reason ENTERPRISE had only one reportable event in the past two years, and the rapid response and application of time critical risk management techniques ensured minimal environmental impact.

3.2 Program Accomplishments.

- Partnered with Naval Facilities Environmental to plan and organize a pier environmental compliance training DVD. This DVD is now required training for all Norfolk-based ships.

- Worked hand-in-hand with two outside contracted organizations in completely refurbishing the ship's solid waste incinerator. Their efforts ensured the ship was able to safely and properly dispose of thousands of tons of hazardous trash and classified material.

The ENTERPRISE's incincerator is shown above. A one-of-a-kind model, it was completely refurbished in 2010. During the 2011deployment, over 100 bags of unclassified and classified trash were incinerated daily.

- The ENTERPRISE maintains a nationally certified asbestos laboratory with 3 analysts. Over 200 thermal insulation samples were analyzed, supporting the ship's Continuous Maintenance Availability and aiding a lagging team which replaced several hundred feet of significantly deteriorated lagging. Also ensured the safe and proper removal, storage and disposal of asbestos lagging in support of 3 successful emergent underway repairs.

4 Accomplishments.

4.1 Air Pollution Control. ENTERPRISE's conviction to improving the environment is no where more evident than in the area of air pollution control. Through aggressive policy, training, and enforcement, ENTERPRISE has made definite positive strides towards better global air quality and ozone conservation. Specific accomplishments include:

- Reduction of Volatile Organic Content (VOC) vapor through a strict painting policy to minimize the release of VOCs by ensuring that only VOC compliant paints and thinners are used, and a continuous enforcement of the Navy no-thinning policy for marine coatings and paints. In addition, a new instruction requiring a cold work chit for every painting job ensures tighter control of HAZMAT inventory.

- Closed-loop refrigerant charging and evacuation systems prevent Freon from being discharged to the atmosphere during Air Conditioning and Refrigerant repair work.

- Refrigerant equipment upgrades to environmentally sound alternative refrigerants. Galley and Wardroom equipment refrigerants replaced with ozone friendly R-134a and R-404a, air conditioning equipment uses ozone R-236, and main refrigeration plants were retrofitted with R-134a, reducing the amount of R-12 CFC by over 1,100 pounds along with halocarbon detectors to enable real-time leak detection.

- Meticulous refrigerant tracking. Refrigerant accountability tracked ounce for ounce in support of 41 water fountains, 41 ice machines, 50 reach-in refrigerators, 9 salad counters, 10 milk dispensers, 72 portable a/c units, 24 self-contained a/c units, 8 centrifugal a/c plants, and 6 refrigeration plants.

4.2 Water Pollution Control. ENTERPRISE is committed to limiting discharge of gray water, black water and oily waste through active management and adherence to established environmental policy.

4.2.1 ENTERPRISE Sailors meet the daily challenge of operating a poorly configured and aging collection, holding, and transfer (CHT) system with phenomenal acuity. Dedication, training, and attention to detail have enabled ship's force to ensure safe system operation to meet environmental guidelines. Strict adherence to procedures and management practices are the key components to ENTERPRISE's success at minimizing spills. Specific management practices include:

- Extensive training for CHT operators including: completion of the Shipboard CHT Personnel Qualification Standard (PQS) NAVEDTRA 43199-D, pre-evolution training for all CHT Shore Connection Detail members, Health Aspects of Marine Sanitation Devices course, and monthly training on general system maintenance for technicians and operators.

- Safety oversight by senior divisional leadership at each valve and connection during all pumping, transfer, and maintenance evolutions.

- Adherence to pumping restrictions delineated in OPNAV 5090.1C and reiterated in ENTERPRISE Standing Orders for Underway Watches.

4.2.2 ENTERPRISE has maintained an exceptional record with only one reportable oil or hazardous substance spill over the past two Fiscal Years. This success is attributed to the three primary pillars of the ENTERPRISE spill prevention program:

- Comprehensive Procedures. ENTERPRISE maintains an up to date, detailed Spill Response Plan which was updated in November 2011. Plans include a straight forward pull out checklist and convenient flow-charts for use by Officers of the Deck and Command Duty Officers to ensure a prompt response and accurate reporting. Links to the response plan are located on the command INTRANET website for easy access by crew members when required.

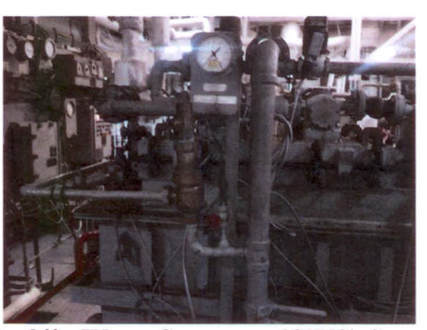
- Detailed Training. Spill prevention and response is an integral part of the training provided to all HAZMAT users which begins during Command Indoctrination, is expanded during qualification training for all authorized HAZMAT users, and reinforced during weekly HAZMAT Petty Officer training. Emergency Response Teams are trained using the Oil/Hazardous Substance Spill Response Scene Leader PQS, and each duty section conducts annual drills to exercise teaming response and cleanup actions with the most recent drill sets being completed in September 2011.

- Proper Equipment. Five HAZMAT Spill kits and one Oil Spill kit are maintained on board in accordance with Allowance Equipment List requirements. Spill kits are inventoried during quarterly HAZMAT program audits to ensure sufficient quantities of spill clean up materials are always available.

One of ENTERPRISE's five HAZMAT spill kits. These are maintained by the DCA and inventoried monthly. One oil spill kit is also found onboard.

4.2.3 ENTERPRISE strictly adheres to pollution management and discharge standards for waste oil and oily waste. Program specifics include:

- Two Oily Water Separators (OWS) process all bilge water. Effluent from the oily water separators is continuously monitored to ensure discharge water is less than 15 parts per million with strict adherence at all time to pollution discharge limits delineated in OPNAV 5090.1C.



ENTERPRISE's Oily Water Separator (OWS) System. Two of these units ensure discharge is maintained at 15 ppm or less. Oily waste is held onboard until shore disposal is authorized.

- All separated oily waste is collected in holding tanks for offload when the ship is in an authorized Navy receiving facility.

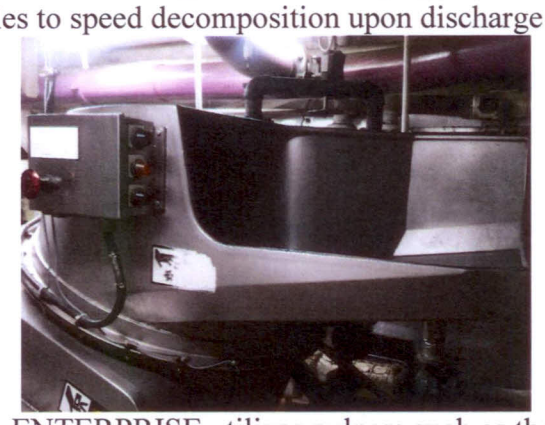
4.3 Solid Waste Management and Resource Recovery

4.3.1 ENTERPRISE strictly enforces the Navy's Hazardous Waste Minimization Plan which prohibits the discharge of hazardous materials, including all plastics, over the side. All excess solid HAZMAT that is generated is properly packaged per local theater governing regulations and transferred to an approved shore facility for proper disposal. ENTERPRISE also mandates trash separation, requiring each division to separate plastic, cardboard, metal, and food for proper processing and disposal. Separated trash is processed in the following manner:

- Plastics are consolidated and melted into "pucks" using nine installed Compressed Melting Units (CMUs) to decrease volume and streamline disposal. Pucks are then loaded into tri-walls for offload.

Six CMUs are found onboard, 3 forward and 3 aft. These dispose of plastic by melting them into "pucks." It reduces the amount of space required for solid waste storage.

- Cardboard is processed through one of three pulper units that shred the bulky material into fine particles to speed decomposition upon discharge into the sea.



While at sea, ENTERPRISE utilizes pulpers such as the one above. This allows for direct discharge of pulpable materials such as cardboard and food refuse. There are 3 of these units onboard the ship.

- Paper waste is minimized through the use of incinerators. The incinerators use contaminated jet fuel to burn the paper waste which in turn reduces oily waste storage and offload requirements.

- Metal shredders are used to crush metal into more compact units, reducing storage area requirements and simplifying disposal.

ENTERPRISE also employs three shredders. Two are for plastics and one for metals. These are used to aid in solid waste storage space reduction.

4.3.2 Waste generation on board ENTERPRISE is reduced through the following source reduction techniques:

- ENTERPRISE maintains a rigorous Ship's Maintenance Material Management (3M) Program in conjunction with properly performed corrective maintenance as the cornerstone of source reduction. Maintaining equipment in peak operating condition reduces HAZMAT losses, in turn reducing generated waste from replacement material packaging. This 3M program was given an 89% during its last 3M Inspection which took place while underway.

- Common use items and substances are bought in bulk quantities and transferred to reusable containers to reduce the waste generated from continuously purchasing and discarding single use or limited use containers. Examples include purchasing of multi-gallon quantities of various cleaning products which are transferred to appropriately labeled, reusable secondary containers to reduce plastic waste.

- Careful attention to storage rooms and storage practices to prevent reactivity by ensuring compatible storage of materials and reduction of waste caused by damaged containers.

4.3.3 A key component of the ENTERPRISE Solid Waste program is resource recovery and recycling. The main methods used are:

- Consistent use of Defense Reutilization and Marketing Office (DRMO) for turn in of obsolete equipment, scrap metal, and other reusable items is the mainstay of the ENTERPRISE recycling program.

- Additionally, packaging waste such as cardboard is turned into the Mid-Atlantic Region Regional Resource, Recovery, and Recycling Center.

- At sea, ENTERPRISE maintains a centralized Excess HAZMAT area where reusable HAZMAT is collected, separated, and stored in properly labeled containers to facilitate offload or reuse when practical.

4.4 Hazardous Material (HM)/Hazardous Waste (HW) Management. HAZMAT control onboard ENTERPRISE is an all hands effort. A dedicated HAZMAT Division ensures the proper storage, handling, issue, use, and disposal of all HAZMAT used by crewmembers through constant training and monitoring. Program management consists of:

- Daily random spot checks conducted by the HAZMAT Division Officer, HAZMAT Leading Petty Officer, and Ship's Safety Officer enforce HAZMAT regulations, identify and remove unauthorized HAZMAT materials, and deter improper storage.

- Results of weekly spot checks of 7-day lockers, storerooms, used HAZMAT cage and HAZMINCEN are briefed to the XO. All areas are inspected quarterly.

- Centralized designated spaces for the Hazardous Inventory Control System (HICS) issue office and HAZMINCEN eliminates the possibility of improperly stored HAZMAT.

- HAZMAT training for crewmembers is continuous. Divisional HAZMAT Petty Officers receive weekly refresher training, proper HAZMAT procedures are stressed during all weekly 3M spot checks, and all available media sources, including the plan-of-the week, ship's newspaper, and SITE TV, are used to provide ship-wide information regarding safe storage and handling methods.

- The HAZMAT Division maintains strict controls over all operations. Significant inventory and waste reduction has been achieved through product substitution and consolidation. ENTERPRISE submitted 75% less SHML Feedback Reports than fleet average, eradicating highly hazardous material from shipboard processes.

- Bulk paints, oils and lubricants are re-packaged into small, reusable containers to minimize waste and maximize re-use. Additionally, the HAZMAT Division provides printed secondary container labels to all HAZMAT users for display on secondary containers.

4.5 Protective Measures Assessment Protocol (PMAP). Integration of the Protective Measures Assessment Protocol (PMAP) tool is ongoing. PMAP software developed by SPAWAR is updated regularly and used to identify requirements for conducting operations in Foreign Exclusive Economic or Fishing Zones, and for all exercises as instructed by COMNAVAIRFOR/ COMNAVSURFOR Instruction 5090.1C as well as guidance provided by the appropriate numbered Fleet Staff. ENTERPRISE lookouts and watch team members receive training regarding marine mammal visual identification and avoidance using the training aids provided by PMAP information webpage. Training events are scheduled during daylight hours to the maximum extent possible to aid in visual surveys for protected species.

4.6 SONAR Positional Report System (SPORTS). Not applicable due to ship's configuration.

4.7 Environmental Awareness. ENTERPRISE strives to maintain the highest level of environmental stewardship through daily, monthly and annual training. It includes the use of

the 1MC, SITE TV, monthly safety committee meetings, the ship's newspaper, and frequent safety stand-downs. Quarterly, rather than annual, reviews of shipboard NAVOSH programs including HAZMAT and Environmental Protection ensures that the Sailors onboard the ENTERPRISE are in compliance with regulations and keeps the focus on program accountability. Nowhere are Sailors better trained on the maintenance and operation of equipment vital to the control of air and water pollution than on ENTERPRISE, and this was substantiated by an overall score of 89% for the 3M Inspection. Daily and weekly HAZMAT spot checks ensure that compliance with Federal and Navy regulations regarding the use and stowage of hazardous materials is always at the forefront. Protecting the environment is an All Hands effort, and with the help of our Divisional Safety Petty Officers and a robust interaction with our CVW-1 partners, USS ENTERPRISE can take pride in its role as a defender of both the land and the seas.