Narrative:

1. The Battle Force Tactical Training (BFTT) In-Service Engineering Agent (ISEA) design team has incorporated Removal of Hazardous Substances (RoHS) into both obsolescence mitigation and new design efforts for hardware. While there are many parts from industry that are destined for military application that contain either cadmium, poly-chlorinated biphenyls, hexavalent chromium or lead, the ISEA has placed a significant emphasis on procuring as many components as possible that meet RoHS specifications to protect both our personnel and the environment. During the design of the AN/USQ-T46D BFTT system, significant emphasis was placed on Environmental Safety and Occupation Health (ESOH) requirements and compliance. During the analysis of hardware components, one of the areas the ISEA design team focused on was the RoHS compliance for the Commercial Off-the-Shelf (COTS) hardware being considered. Using the RoHS standard for compliance and hardware analysis results, the team determined they could significantly reduce the amount of harmful metals contained within the electronics of the system. The results include: A reduction in the amount of toxic material that is introduced with system deployment, therefore decreasing the risk of hazard to personnel. A reduction in the carbon footprint of the system by limiting the amount of power required to operate the system. And, a reduction in the environmental stabilization needs being the currently installed system (including the monitors) uses approximately 33% less power in the steady state, and dissipates approximately 25% less heat to the atmosphere, resulting in a reduced demand for Heating, Ventilation and Air Conditioning (HVAC) services to the space.

2. The BFTT ISEA remains committed to reusing suitable components. As the AN/USQ-T46D BFTT system is installed in the Fleet, the system which it replaces is removed and shipped back to the ISEA. The returned system is thoroughly inspected to ensure that all usable parts are removed, maintained, and stored as Sponsor Owned Material (SOM). This process ensures the upkeep, maintenance and obsolescence issues for the retiring system is minimized. Accordingly, Total Ownership Cost (TOC) is achieved as parts are refurbished and reused to maintain operational capability for the aging training system. In FY10 alone, there were 10 BFTT systems replaced in the Fleet whereby the aging systems were returned to the ISEA and staged to go through the process evaluation and reutilization for suitable, used parts. This process saves several hundred pounds of metal from being discarded.

3. The BFTT ISEA design team has moved away from the legacy Cathode Ray Tube (CRT) monitors, to monitors that are Energy Star compliant. The process of replacing the CRTs with Energy Star compliant flat panel monitors has resulted in a significant reduction of toxins in the Fleet. The Energy Star compliant Liquid Crystal Display (LCDs) save, on average, 850 kWh/year per system (2 montiors per system). In FY10, by installing 10 systems, the BFTT program saved 8,500 kWh (approximately enough energy to power an average U.S. residential household for 9 months).

Accomplishments:

The Battle Force Tactical Training (BFTT) In-Service Engineering Agent (ISEA) design team has incorporated Environmental Safety and Occupational Health (ESOH) objectives throughout

the product lifecycle. For BFTT, Programmatic Environmental, Safety, and Health Evaluation (PESHE) are a part of the Systems Engineering Plan, aiding in the ESOH requirements and analyses. The progress made during the award period includes 6 formal technical reviews (1 Preliminary Design Review, 2 Critical Design Reviews, 2 Program Management Reviews and an In-Service Review), where several ESOH system risks were identified and addressed. Additionally, 8 System certification events were conducted that included ESOH risk mitigation, and 6 instances of concurrence by the Weapon Systems Explosive Safety Review Board (WSESRB) for BFTT System Deployment. Risk management, including mitigation and/or acceptance was performed in accordance with the BFTT Systems Engineering Plan, and the BFTT System Safety Program Plan. The BFTT system is evaluated using the total systems approach to address potential risks which included ESOH regulatory compliance, hazardous material use and hazardous waste generation, pollution (i.e. effluents, discharges, emissions, noise), safety (including system safety, explosives safety, ionizing and non-ionizing radiation), and human health (associated with exposure to chemical, physical, biological, or ergonomic hazards, etc.) .

In accordance with the above guidance, the BFTT Program (a) significantly reduced the amount of toxic material that is introduced with system deployment, therefore decreasing the risk of hazard to personnel; and (b) reduced the carbon footprint of the system by limiting the amount of power required to operate the system; the currently installed system (including the monitors) uses approximately 33% less power in the steady state, and dissipates approximately 25% less heat to the atmosphere, resulting in a reduced demand for Heating, Ventilation and Air Conditioning (HVAC) services to the space.

Potential life cycle cost avoidance or savings from design and/or process changes identified to mitigate system-related ESOH risks over the life cycle. As the AN/USQ-T46D BFTT system is installed in the Fleet, the system which it replaces is removed and shipped back to the ISEA. The returned system is thoroughly inspected to ensure that all usable parts are removed, maintained, and stored as Sponsor Owned Material (SOM). This process ensures the upkeep, maintenance and obsolescence issues for the retiring system is minimized and reduces Total Ownership Cost (TOC). In FY10, there were 10 BFTT systems replaced in the Fleet whereby the aging systems were returned to the ISEA and staged to go through the process evaluation and reutilization for suitable, used parts. This process saved several hundred pounds of metal from being discarded. In addition, the BFTT ISEA design team has moved away from the legacy Cathode Ray Tube (CRT) monitors, to monitors that are Energy Star compliant. The process of replacing the CRTs with Energy Star compliant flat panel monitors has resulted in a significant reduction of toxins in the Fleet. The Energy Star compliant Liquid Crystal Display (LCDs) saves, on average 850 kWh/year per system (2 monitors per system). In FY10, by installing 10 systems, the BFTT program saved 8,500 kWh (approximately enough energy to power an average U.S. residential household for 9 months).

In conclusion, the Battle Force Tactical Training (BFTT) In-Service Engineering Agent (ISEA) design team in committed to ESOH compliance and to seek continual improvement in the implementation/enhancement of ESOH processes.

Figure 1. Mark Schroeder, BFTT ISEA design team member, removes the cover from the BFTT Operator Processing Console (BOPC) Advanced Technical Extended (ATX) chassis. The COTS motherboard computer enclosed within the chassis was a RoHS hardware replacement component.

U.S. Navy photo by Tammy Van Dame, CDSA Dam Neck.

Figure 2. Nominated team members from L-R, Brian Schwark, Randy Tucker, Mark Schroeder and Timothy Gilbert pose in front of before and after efforts in recycled and reused standard VME chassis. The BFTT ISEA team at CDSA Dam Neck continues to be vigilant in the pursuit of Environmental Excellence in Weapon System Acquisition.

U.S. Navy photo by Tammy Van Dame.

Figure 3. The BFTT ISEA design team unpacks a small portion of nearly two tons of parts that were recovered from CVN 71, USS Theodore Roosevelt. More than one million dollars in savings is expected from their recovery efforts. Pictured from L-R, Timothy Gilbert, Randy Tucker, Brian Schwark and Mark Schroeder.

U.S. Navy photo by Tammy Van Dame, CDSA Dam Neck.

Figure 4. Recovered parts from CVN 71, USS Theodore Roosevelt that continue to be reused, refurbished and/or recycled. To date, in excess of one million dollars has been saved in support of Combat Direction Systems Activity Dam Necks Environmental Excellence in Weapon System Acquisition efforts.

U.S. Navy photo by Tammy Van Dame, CDSA Dam Neck.

Figure 5. Electronics Technician, Mike Ellis refurbishing the Trainer Stimulator Simulator System is support of the BFTT ISEA design teams efforts to incorporate Removal of Hazardous Substances (RoHS) into both obsolescence mitigation and new design efforts for hardware.

U.S. Navy photo by Tammy Van Dame, CDSA Dam Neck.

Figure 6. From left, Electronics Technicians Randy Constant and Steve Farmer conduct single board computer testing in the Integrated Training Systems Lab Complex at CDSA Dam Neck to determine the reuse viability of recovered parts, in support of the BFTT ISEA design teams recycling and refurbishing efforts.

U.S. Navy photo by Tammy Van Dame, CDSA Dam Neck.