

Meteorological Mobile Facility (Replacement) Next Generation (METMF(R) NEXGEN)

PROGRAM DESCRIPTION

The Mobile Meteorological Facility (Replacement) Next Generation (METMF(R) NEXGEN) is a U.S. Marine Corps mobile tactical meteorological system designed in a sheltered HMMWV in support of the Marine Air Ground Task Force (MAGTF). The program is managed by the Program Executive Office for Command, Control, Communications, Computers, and Intelligence (PEO C4I), Battlespace Awareness & Information Operations Office (PMW 120).



HSI CHALLENGE

This system consists of several meteorological sub-systems that are stored within a limited space and must be used safely and efficiently by operators and technicians within tight time constraints under challenging environmental conditions. Integration of system components such as the meteorological sub-systems was challenging due to the predominant use of Commercial-Off-The-Shelf (COTS) products, which required a unique supervisory-user interface and alerting framework for effective monitoring of system status.

APPROACH

PSE provided human systems integration (HSI) support to systems engineering efforts during design, development, and testing. Supporting design and development, PSE reviewed preliminary system designs and successfully facilitated working groups with users and engineers to articulate operational task flows and derive human factors requirements to reduce human error and improve overall system performance. Supporting test and evaluation, PSE performed risk analyses on data collected from users during system demonstrations and test events. These analyses provided feedback on system usability, user impact, and any existing or future operational HSI issues.

SOLUTION

Based on operational task flows and analysis of user tasks and goals, PSE provided human factors support and recommendations impacting the (a) organization and placement of controls and displays in the shelter, (b) ergonomic design of physical workstations, (c) design and usability of software, (d) alerting and status displays, (e) procedures to mitigate safety risks, and (f) embark/debark procedures. PSE also helped to derive 82 detailed system design requirements and generated 7 new design concepts across 10 sub-systems to optimize system performance and safety during meteorological operations.

During test and evaluation, PSE ensured tests were consistent with operational task flows, verified/validated HSI system and HFE design requirements, assessed occupational safety hazards, human performance risks (workload, safety, error), and usability, and generated solutions/mitigation strategies for high-risk human performance areas.

BENEFITS

PSE successfully improved the usability and design of this system by reducing operator workload, human error, and safety hazards. This helped maximize the throughput of the system, its capabilities, and operational utility. The HSI support provided by PSE mitigated the human performance risks and maximized operator effectiveness.

This effort was performed during the entire Technology Development and Engineering & Manufacturing Development Phases. It was sponsored by the Battlespace Awareness & Information Operations Office (PMW 120) and the Space and Naval Warfare Systems Command (SPAWAR), Architecture and Human Systems. Results from this systems engineering effort supported the Marine Air Ground Task Force (MAGTF) and United States Marine Corps (USMC) meteorological operations.

