

Adoption of the Equivital™ Black Ghost Physiological Status Monitoring Systems by the Weapons of Mass Destruction – Civil Support Teams (WMD-CST's) to Provide for the Health and Safety of Soldiers

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Potential heat injuries pose a significant risk to soldiers and others encapsulated in chemical, biological, radiological, and nuclear (CBRN) personal protective equipment (PPE). Currently, safety of WMD-CST soldiers with CBRN missions, who operate within the contaminated "hot zone", use a subjective "buddy system" to provide for their health and safety. This subjective assessment has downrange personnel using radio communications to describe to medical personnel and command staff the subjective status of their battle buddy. Medical and command staff personnel are typically located remotely in the safe non-contaminated area or "cold zone." Decisions based on these subjective radio reports are made by health care providers from this remote location. As a guideline, thermal-work limits have typically been set based on group means and normal ranges in response to these particular conditions. Recently, individualized monitoring and predictive algorithms from real time physiological status monitoring systems provide objective information that leads to data-driven mission management and real time situational awareness. The Equivital™ Black Ghost System (Equivital Ltd, Cambridge, UK) is a real time physiological status monitoring system, that provides real time & retrospective data capture, viewing & analysis, for this enhanced individualized capability. Whilst having both FDA 510k & Intrinsic safety approvals, the system has also been successfully tested and fielded to the WMD-CST community to meet their validated requirements. The U.S. National Guard Bureau, the parent organization for the WMD-CST's is the first U.S. organizational adopter of real time physiological monitoring for operational safety and performance; with system roll out occurring in 2017 and 2018 to its 57 teams across the U.S. and its territories. The development of user requirements, training materials, a medical technical directive, and validated new equipment training provided to subjects & users are key components for the successful adoption and use of this technology. The process will continue with a post market surveillance research effort to ensure iterative adjustments and improvements are incorporated from the ultimate innovator, the end user. Future efforts include modifying the system as needed to meet the requirements of the larger CBRN community beyond the WMD-CST's.

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