AUTOMATION OF SHIPBOARD HEAT STRESS MONITORING

Whether in port or underway, conditions of high heat and humidity can be found in many spaces on board Navy ships. Some of the most likely spaces to find such conditions are machinery spaces, galleys, sculleries, laundries, incinerator rooms, and steam catapult rooms.

Conditions of high heat and humidity can make heat stress a serious health concern aboard any Navy ship. Heat stress is the

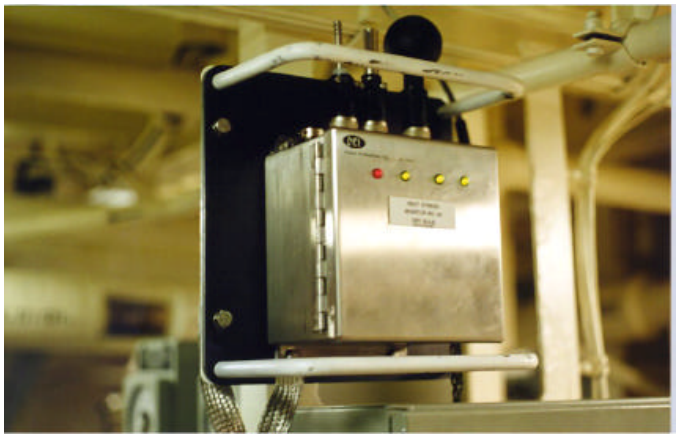
sum of the heat generated by the body, plus the heat gained from the environment, minus body heat that is lost to the environment. When the surrounding air is already high in moisture content, or humidity, it is difficult for the air to hold more moisture evaporating from perspiring bodies. Therefore, less body heat can be transferred to the surrounding air when it is humid. This puts more stress on the body as it attempts to regulate its core temperature.

When the body is no longer able to regulate its internal temperature due to high heat load, heat-related illness, which could become life threatening, may result

In order to determine the length of time it is safe for an individual to work under high heat

stress conditions, the Navy measures heat and humidity in shipboard spaces using a Wet Bulb Dry Globe Thermometer (WBGT) meter. The WBGT meter integrates measurements of air temperature, humidity, and radiant heat into a single value known as the Heat Stress Index. The Heat Stress Index is used together with a worker's physical exertion level to calculate that

individual's Permissible Heat Exposure Limit (PHEL). The PHEL indicates the length of time an individual can safely continue to work in a specific heat stress environment at a specific level of physical exertion.



A combined Naval Health Research Center and Naval Sea Systems Command Smart Ship initiative has simplified the process of monitoring heat stress conditions on board Navy ships. A new meter, the Automated Heat Stress System (AHSS) WBGT Unit, is being installed on DDG Class ships. This fully automated meter eliminates the need to manually record temperature readings every hour. The unit allows heat stress surveys to be completed in minutes instead of the 3 to 5 hours previously required to complete such surveys. By using the new meter, a ship on a six-month deployment to a hot climate can save 3,000 to 5,500 man-hours.