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## **M1Or4A-04: [Invited] Non-functional superconducting system requirements in a marine environment**

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The US Navy has been investing in superconducting and cryogenic technology since the 1940's when the Navy Research Lab published its first scientific article on the subject. Since then the Office of Naval Research and the Naval Sea Systems Command have worked towards developing applications of the technology including motors, generators, cables, and magnets. When designing such complex systems, a set of specifications and requirements are the basis for meeting performance metrics. For example, a ship propulsion motor must provide a certain level of power to provide enough speed for the ship. Therefore, the motor must operate at the required torque and speed to generate this power. A motor design engineer is able to calculate these requirements, and a test engineer is able to measure these requirements. Quantifiable requirements may be considered as functional since they are necessary to meet a goal. Non-functional requirements are also important when designing superconducting systems for use in military applications, specifically in the marine environment. These non-functional requirements may include quality attributes of affordability, availability, reliability, sustainability, resiliency, and upgradeability to name a few. As the US Navy starts to adopt superconducting and cryogenic technology for use in the Fleet these non-functional requirements become more important to ensure safe and continuous operation of its ships and sailors. It is the responsibility of the engineers and researchers working on new applications to ensure these aspects of a system are considered along the way. Therefore, the goal of presenting these concepts is to make the superconducting and cryogenic community at large aware of these additional non-functional requirements that must be included for the US Navy to embrace the technology.

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