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Development of a Multiple Megaampere, Pulsed Power Lab

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Of general interest to the scientific and engineering community is the development of facilities for testing, validation, and qualification of pulsed power systems, components, and assemblies. Naval Surface Warfare Center Dahlgren Division (NSWCDD) has a long history of designing and implementing facilities for testing pulsed power systems capable of generating, transmitting, and sinking multiple megaamperes of peak electrical current at world record energy levels. Of general interest to the electric ship and weapon communities are the processes used to develop requirements for, and verify the capabilities of, these facilities. NSWCDD is developing a new laboratory within an existing facility using resident legacy pulsed power capabilities that can provide a wide range of electrical actions and peak currents. The new laboratory will be able to test and qualify pulsed power components in a number of test fixtures, as well as scaled and full size assemblies utilizing these components.

In this paper, the authors will discuss the requirements development process and how different portions of the laboratory meet or exceed the basic requirements to provide for future growth. Additionally, the paper will discuss how the existing legacy pulsed power system influenced these requirements, limits future capability of the laboratory, and how these limits may be overcome. A phased construction and facility qualification plan will be presented.

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