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Progress and Status of Cryogenic Refrigeration System for Project Hydra

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In the last decade, significant advances in the performance of second generation (2G) high temperature superconducting wire have made it suitable for commercially viable applications such as electric power cables and fault current limiters. Currently, the U.S. Department of Homeland Security is co-funding the design, development and demonstration of an inherently fault current limiting HTS cable under the Hydra project with American Superconductor and Consolidated Edison Company of New York, Inc. The cable will be approximately 200m long and is being designed to carry 96 MVA at a distribution level voltage of 13.8kV. The cable will be installed and energized near New York City. The project is led by American Superconductor teamed with Con Edison, Ultera (Southwire and nkt cables joint venture), Altran Solutions, and DH Industries. This paper describes the progress and status of the cryogenic refrigeration system designed and manufactured for the project. The refrigeration system successfully passed factory acceptance testing in November 2014. Details of the test results will be provided.

Primary author: Dr YUAN, Jie (AMSC)

Co-authors: CATSEMAN, Fred (DH Industries); HENDERSON, Nancy (AMSC); HENK, Tilleman (DH Industries)

Presenter: Dr YUAN, Jie (AMSC)

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