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PROTOTYPIC MHD ANODE DESIGNS AND CONFIRMATION TEST RESULTS*

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ABSTRACT

This paper reviews the design and the design rationale for the anode electrodes of the Integrated Topping Cycle (ITC) MHD power generator. This power generator is currently undergoing proof-of-concept (POC) duration testing at the U.S. Department of Energy's Component Development and Integration Facility (CDIF) in Butte, Montana.

The major anode lifetime-limiting mechanisms, as well as the design features adopted to overcome these mechanisms, are described in detail in the full paper. Anode fabrication procedures are reviewed. Also described is the nondestructive ultrasonic inspection technique used to evaluate the braze joints of all production electrode pieces. Finally, the test results from the coal-fired confirmation tests of the prototypic anode design are reported. These tests were carried out in the workhorse generator channel at the CDIF between 1991 and 1992. Several alternative anode designs also have projected lifetimes exceeding the ITC 2000-hour lifetime requirement.

The manuscript was not prepared in time to be included in the Proceedings. Copies of the full paper will be available at the Symposium.

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