

February 18, 2010

Rita Baranwal, Ph.D.  
Manager, Materials and Fuel Rod Design  
Product Engineering  
Westinghouse Electric Company  
Columbia, SC 29209

Dear Dr. Baranwal:

As you are aware, the Nuclear Regulatory Commission (NRC) is conducting its fuel cladding testing program at Argonne National Laboratory (ANL) in order to investigate the behavior of fuel at high burnups under transient conditions. Westinghouse, along with the Electric Power Research Institute and other fuel vendors, has participated in this collaborative program. In particular, Westinghouse has provided ZIRLO™ tubing for the tests that have been conducted to date.

We are continuing this test program to investigate the response of pre-hydrided cladding under loss-of-coolant accident (LOCA) conditions. We have exhausted the supply of ZIRLO™ tubing that you had provided and request 45 feet of standard 17x17 ZIRLO™ with nominal outer diameter and wall thickness of 9.5 and 0.57 millimeter, respectively, to complete the new tests.

Under this new test program we plan to develop a consistent method for pre-hydridding one foot lengths of tubing and to perform integral LOCA tests with as-received tubing and pre-hydrided tubing. These tests use about 32-cm-long segments that are pressurized and heated in steam through a LOCA-type temperature cycle. These segments balloon and burst and then oxidize to equivalent cladding reacted (ECR) levels between 5% and 20% ECR, depending on the average balloon strain, the test time, and the hold temperature. Different levels of pressurization are used to achieve small balloon strains (20-40%) and larger strains (40-70%). As-fabricated samples are heated to a hold temperature of 1200 C, while pre-hydrided (300-600 wppm hydrogen) samples are heated to a hold temperature of 1050 C. After cooling, the segments are placed in an oven and bend-tested at 135 C. For more information, please refer to the description of such testing in section 6.1.3 of NUREG/CR-6967.

As we have done before, the results of these tests with Westinghouse ZIRLO™ will be provided to you. NRC appreciates Westinghouse's cooperation in our test program and we look forward to continued collaboration in this new phase of our research.

Sincerely,

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Dr. Jennifer L. Uhle, Director  
Division of Systems Analysis  
Office of Nuclear Regulatory Research

Rita Baranwal, Ph.D.  
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Dr. Jennifer L. Uhle, Director  
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