

From: Mark Leyse [markleyse@gmail.com]
Sent: Monday, April 04, 2011 9:58 PM
To: Inverso, Tara; Dudley, Richard; Clifford, Paul
Cc: Robert H. Leyse; Dave Lochbaum
Subject: Water Chemistry and Fuel Element Scale in EBWR
Attachments: Water Chemistry and Fuel Element Scale in EBWR.pdf

Dear Ms. Inverso, Mr. Dudley, and Mr. Clifford:

I wanted to send you an ANL paper my father, Robert H. Leyse, coauthored: it discusses the thermal resistance of crud (scale) on the fuel elements of the EBWR. It is ANL-6136, published in 1960. The title is "Water Chemistry and Fuel Element Scale in EBWR."

Among other things the abstract states:

"The last two sections of the report give the results of studies of the heat transfer characteristics of fuel element scale and effects of high-temperature heating on scale removal and fuel element growth. The maximum scale thickness measured was about 0.008 in. Heat transfer calculations based on scale thermal conductivity measurements indicate the possibility of maximum fuel temperatures as high as 1692 F at 100-Mw operation of the core. This temperature is in a range where fuel growth, with resulting fuel element distortion and damage, is expected. Observed trends that may alleviate damage are the tendency of scale to flake off in high heat transfer areas, and the restraining effect of cladding on growth of fuel. No satisfactory means has been found to descale the fuel plates."

Also, reference 33 is for a report Robert H. Leyse wrote, "Scale on Fuel Elements in EBWR." A test report that was incorporated into "EBWR Operational History," ANL-6229. These reports show that the thermal resistance of crud on fuel elements was reported on as far back as the late 1950's/1960.

Would you please place this e-mail and "Water Chemistry and Fuel Element Scale in EBWR" into Web-Based ADAMS.

Thank you,

Mark Leyse