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NRC Ignores Fouling in RIA and LOCA Analyses

Even though Fouling of Nuclear Reactor Fuel Elements (Fouling) has a greater impact on Reactivity Insertion Accidents (RIAs) and Loss of Coolant Accidents (LOCAs) than high-burnup, the NRC and its collaborators continue to totally ignore the impact of Fouling. The following public documents affirm this assertion:

There was no discussion of Fouling during the October 9, 2002, the ACRS Subcommittee on Reactor Fuels. The Electric Power Research Institute (EPRI) discussed its unwarranted topical report on the response of high-burnup fuel to reactivity insertion accidents. EPRI disclosed nothing about the impact of Fouling and the Subcommittee asked no related questions.

Again, there was no discussion of Fouling in follow-on presentations to the Full ACRS on October 10, 2002. The Chairman of the Reactor Fuels Subcommittee described the EPRI presentation as, "... a very delightful presentation from the Electric Power Research Institute in describing its work on Reactivity Insertion Accidents to date." The Full ACRS asked no questions related to Fouling.

On October 17, 2002, the Full ACRS sent a letter to the Chairman, NRC, with the subject: CONFIRMATORY RESEARCH PROGRAM ON HIGH-BURNUP FUEL. There is no discussion of Fouling in this letter. In fact the ACRS lauds the NRC approaches, "RES has a well-organized and leveraged program of confirmatory research on the behavior of high-burnup fuel under the conditions of reactivity insertion events in pressurized water reactors, design-basis loss-of-coolant accidents (LOCAs), and anticipated transients without scram in boiling water reactors." Surprisingly, the ACRS expressed a somewhat veiled concern as follows: "We remain concerned that the time-temperature conditions used in the study of high-burnup fuel during design-basis LOCAs may not reveal phenomena unique to high-burnup fuel." Well, the ACRS is invited to view the enclosed photograph that reveals the results (without burn-up or Fouling) when otherwise realistic time-temperature-flow conditions are deployed (FLECHT Run 9573).

On November 12, 2002, the ACRS Subcommittee on Thermal-Hydraulic Phenomena discussed the Rod Bundle Heat Transfer (RBHT) program that is being conducted at Pennsylvania State University. The RBHT program includes no provisions for the impact of Fouling of the heat transfer surfaces. Thus, this program is useless from the view of realism in evaluating the LOCA characteristics of licensed nuclear power reactors. Surprisingly, the ACRS did not point out this gross inadequacy of the RBHT program. At times, the discussions referred to the NRC's TRAC series of reactor safety analysis codes. These codes include no provisions for Fouling and thus are also useless for the realistic evaluation of LOCAs.

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