

**PRM-50-84
(72FR28902)**

From: "C.C. Lin" <chchlin@comcast.net>
To: <SECY@nrc.gov>
Date: Fri, Aug 3, 2007 1:59 PM
Subject: Comments on Petition to amend 10 CFR Part 50 (PRM-50-84)

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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Attn: Rulemaking and Adjudication Staff,

Secretary, U.S. Nuclear Regulatory Commission

I am a retired chemist and specialized in reactor coolant chemistry. I have noticed an article "A Partition to Limit Fuel Cladding Deposits" in the June 2007 issue of Nuclear News. I have carefully reviewed the petition by Dr. Leyse to amend 10 CFR Part 50. As a private citizen, my comments are given below:

It is well known that there are two distinguishable layers on the fuel cladding deposit in BWRs; the inner layer consists of mostly tenacious mixed oxides in spinel structure called "ferrite" (such as: NiFe_2O_4 and ZnFe_2O_4), and the outer layer consists of mostly porous iron oxide ($\alpha\text{-Fe}_2\text{O}_3$). Zinc addition in many plants is a practice to reduce the radiation buildup on the out-of-core surfaces. Zn addition seems to create the tenacious layer in the fuel deposit which effectively reduces the release of activated corrosion products, mainly Co-60, from the deposit.

In my opinion, the problem may not be the total amount (or thickness) of the crud on fuel cladding, but the potential culprit could be the tenacious ferrite deposit, which has been suspected to be the cause of cladding overheat and oxide spallation in some BWRs. The crud input from the BWR feedwater system has been suggested to control at 0.5 - 1.0 ppb and further reduction could be a great burden to reactor operators. However, since the thermal conductivity of the ferrite on fuel deposit is not known, the potential effects of the tenacious layer created by the addition of transition metal ions should be seriously evaluated.

Sincerely,

C. C. Lin, a private citizen

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