From: Carl Lyon
To: Donald Jones; Karla Stoedter
Date: 1/30/03 11:43AM
Subject: CRD Welds Follow-up

The EMCB staff has concluded that BWRs that have not updated to the 1995 Edition of the Code do not have to inspect the CRD housings, if the exemption of IWB-1220 applies to them. The exemption would apply if the licensee has a calculation showing that, "upon postulated rupture the resulting flow of coolant from the RCS under normal plant operating conditions is within the capacity of the makeup systems which are operable from on-site emergency power."

If the licensee has updated to the 1995 Edition or subsequent, the licensee may not take credit for ECCS in their calculation, so the exemption would probably not apply. The 1995 Edition added the sentence, "The emergency core cooling systems are excluded from the calculation of the makeup capacity," which is much stricter and in line with the staff thinking.

FYI, I've attached Mike Modes' email explanation to the Region I folks.

Quad Cities is a 1989 Edition plant. For Quad Cities, then, the CRD housings would be exempt from inspection. Of course, I just received in the mail their 4th interval ISI program plan, which updates them to the 1995 Edition with 1996 Addenda, so in the future they'll have to do the inspections anyway.

For those plants which are not able to apply the exemption of IWB-1220, regardless of Code Edition, the staff is not amenable to granting relief, even if it was granted in the past.

CC: David Hills; Lakshminaras Raghavan; Mark Ring; Michael Kurth; Scott Wall; Terence Chan

From: Michael Modes
To: Burns, Thomas; Kaufman, Paul; Lohmeier, Alfred; Pindale, Stephen
Date: 12/26/02 8:41AM
Subject: Issue: BWR CRDM Housings are Exempt from Examination

An issue developed at Quad Cities and Dresden, apparently as a consequence of questions by RIII inspectors, about BWR CRDM housings, that brought ASME Section XI, IWB-1220 to the attention of the agency. IWB-1220 states, in part:

"The following components or parts of components are exempted from the volumetric and surface examination requirements of IWB-2500: (a) components that are connected to the reactor coolant system and part of the reactor coolant pressure boundary, and that are of such a size and shape so that upon postulated rupture the resulting flow of coolant from the reactor coolant system under normal operating conditions is within the capacity of the makeup systems that are operable from the on-site emergency power."

Apparently the NRC did not fully appreciate the implications of this exemption when we endorsed it in 10 CFR 50.55a and that it applied to CRDM housing in BWRs. I was unaware this had become an issue until someone at Limerick asked me how I thought they should be responding to the issue. After correspondence with RIII and NRR, the ASME interpretation was, I believe, finally agreed to by NRR. First a definition:

"Part 50, App A. Criterion 33- Reactor Coolant Makeup. A system to supply reactor coolant makeup for protection against small breaks in the reactor coolant pressure boundary shall be provided. ... The system shall be designed to assure that for onsite electric power system operations (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished using existing piping, pump, and valves used to maintain coolant inventory during normal reactor operations."

When we first endorsed IWB-1220 we interpreted it to mean the safety injection system (not normal make up) used to mitigate a small-break LOCA, because that was the definition of "Reactor Coolant Makeup" in place in our regulations at the time of the endorsement. It is also the reason the phrase "operable from on-site emergency power" found its way into the ASME Code in IWB-1220. It had nothing what-so-ever to do with normal make up.

The exemption can not be applied to the Reactor Vessel itself because the welds in the vessel are not a "size and shape so that upon postulated rupture the resulting flow of coolant from the reactor coolant system under normal plant operating conditions is within the capacity of make-up systems ..." Reactor vessel welds don't meet the size and shape criteria ... any attachment to the reactor vessel or pressure piping, of the right cross sectional area, does fit the definition however, including CRDM housings.

The reason this exemption was placed in IWB-1000 (and not separately as a foot note to applicable tables, for example) was because it is coupled with IWB-1100 "Scope" which says: "This subsection provides requirements for inservice inspection of Class 1 pressure retaining components and their welded attachments in the light-water cooled plants." This generalizes the exemption to include all pressure retaining components.

After the RIII utility was pressed on this issue, the utility went to ASME for a non-binding

interpretation. (Non-binding on the agency because we do not endorse the interpretation process in ASME) The interpretation committee correctly verified the applicability when it agreed the CRDM housing could be exempted. The key, in applying the exemption, is the ability to makeup the flow. Limerick, for example, has a calculation, updated for power uprate, that shows they can makeup the loss of more then one CRDM housing. Thus, they don't have to examine these low probability failure components. Susquehanna has a similar calculation, however, they choose to examine the housings anyway.

It should be noted this all changes in the 1995 Addenda to ASME Section XI when the sentence "The emergency core cooling systems are excluded from the calculation of the makeup capacity" was added to the end of the paragraph.

Why am I bringing this to your attention?

First to keep you informed of "hot" ISI issues and this is apparently a hot one.

Secondly to ask, when you perform your next ISI inspection at a boiler, you verify the licensee is either testing the CRDM housings according to ASME or if they are not, they have a calculation that shows they have adequate make-up. If they are using the pre-1995 addenda then they are allowed to take credit for the safety injection ... after the addenda was issued they can no longer take credit for safety injection.

And you thought ASME was boring didn't you? Come on ... admit it.

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Creation Date: 1/30/03 11:43AM
From: Carl Lyon

Created By: CFL@nrc.gov

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