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Draft Letter to the Nuclear Energy Institute Regarding the Clarification of Regulatory Paths for Lead Test Assemblies

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Draft Letter to Nuclear Energy Institute Regarding Clarification of Regulatory Paths for Lead Test Assemblies

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ADD= Sihan Ding, Kimberly Green & Janet Burkhardt

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General Comment

See attached file(s)

Attachments

The draft letter to NEI states

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For 10 CFR 50.59(c)(2)(vii), "Result in a design basis limit for a fission product barrier as described in the FSAR (as updated) being exceeded or altered," NEI 96 07, Revision 1, Section 4.3.7 states, in part, that "[i]f an engineering evaluation demonstrates that the analysis presented in the UFSAR remains bounding, then no further 10 CFR 50.59(c)(2)(vii) evaluation is required." If the LTA campaign demonstrates, via the selection of limited quantity and restricted location, that the UFSAR AOR remain bounding, the licensee could answer this question with a "No."

The draft letter to NEI describes the STS LTA provision as follows [emphasis added]:

The TS provision of non limiting core regions is dependent upon plant operating parameters (e.g., power density) and the UFSAR AOR. A non limiting core region is a location where the LTA will not be the bounding assembly for any safety analyses (e.g., peak linear heat generation rate, peak clad temperature, minimum departure from nucleate boiling). Non limiting core regions should be selected such that the new design features of the LTA are conservative for the respective design, performance, and safety limits relative to the co resident fuel assemblies during normal operation, anticipated operational occurrences, and postulated accidents. As such, if the LTAs are more conservative with respect to the design, performance, and safety limits, then the performance of safety related structures, systems, and components (SSCs) (i.e., ability to perform intended safety functions) will not be dictated by the performance of the LTAs and reasonable assurance of adequate protection continues to be maintained with respect to the loading and irradiation of LTAs under the STS LTA provision.

The draft letter to NEI is not consistent with NEI 96-07, Revision 1, Section 4.3.7, which states [with emphasis added]:

A specific proposed activity requires a license amendment if the design basis limit for a fission product barrier is "exceeded or altered." The term "exceeded" means that as a result of the proposed activity, the facility's predicted response would be less conservative than the numerical design basis limit identified above. The term "altered" means the design basis limit itself is changed.

Altering a design basis limit for a fission product barrier is not a routine activity, but it can occur. An example of this would be changing the DNBR value from the value corresponding to the 95/95 criterion for a given DNB correlation, perhaps as a result of a new fuel design being implemented. (A new correlation or a new value for the "95/95 DNB criterion" with the same fuel type would be evaluated under criterion (c)(2)(viii) of the rule.)

The draft letter to NEI provides no basis for the statement "If the LTA campaign demonstrates, via the selection of limited quantity and restricted location, that the UFSAR AOR remain bounding, the licensee could answer this question with a "No." There is no requirement or definition of what is meant by the

STS LTA phrase "non limiting core regions." The draft letter to NEI states, "A non limiting core region is a location where the LTA will not be the bounding assembly for any safety analyses (e.g., peak linear heat generation rate, peak clad temperature, minimum departure from nucleate boiling)." However, past LTA programs for example have limited peak linear heat generation rate (LHGR) to 90-95% of the peak core value to justify a non-limiting location. NEI 96-07, Revision 1, Section 4.3.7, provides a table of examples of typical fission product barrier design basis limits. For "Fuel Cladding" the table specifies the parameters with design basis limits are DNBR/MCPR, Fuel temperature, Linear heat rate, Fuel enthalpy, Clad strain, Fuel burnup, Clad temperature, and Clad oxidation. The draft letter to NEI provides no basis for why "the selection of limited quantity and restricted location" is in any way related to or otherwise addresses each of these fuel cladding design basis limit parameters which is necessary to support a 10 CFR 50.59(c)(2)(vii) determination that the LTAs do not result in a design basis limit for a fission product barrier as described in the FSAR (as updated) being exceeded or altered.

Further, the draft letter to NEI fails to recognize that the regulation requires prior agency review through a license amendment request when a design basis limit for a fission product barrier is altered. This is irrespective of whether the change to the limit is conservative or non-conservative. As stated in the Statements of Consideration for 10 CFR 50.59, 64 FR 53582 dated October 4, 1999, "The rule language that provides that a design basis limit may not be altered provides important and needed assurance. Changes that involve alteration of the design basis limit for a fission product barrier involve such a fundamental alteration of the facility design that a change, even in the conservative direction should receive NRC review."

It is equally important to understand that the change is the different fuel assembly cladding and/or fuel type. This regulations requires that the design basis limits for the changed fission product barrier be assessed against the limits that are included in the UFSAR. For example if the DNBR listed in the UFSAR for the existing fuel design is 1.25 and the calculated DNBR for a rod or fuel assembly with a different cladding and/or fuel type is 1.35, in accordance with 10 CFR 50.59(c)(2)(vii) the design basis limit for a fission product barrier has been altered and prior agency review through a license amendment is required. It should be noted that this is also the case if the calculated value was 1.15.

The argument provided in the non-concurrence response, takes language out of context from NEI 96-07 rev 1. The language regarding engineering evaluations and this 50.59 criterion is provided to address situations where a licensee is trying to determine if a change to another system, structure or component has the effect of altering a design basis limit for a fission product barrier. This language was never intended to be used to asses some measure of which alterations of design basis limits for fission product barriers must receive prior NRC approval. It is clear from the rule language that fuel cladding is a fission product barrier and that if any of the UFSAR described design basis limits such as cladding strain, rod pressure etc is altered - prior approval is required. In fact this was the express purpose of the regulation as described in detail in the statements of consideration associated with the rule.