Westinghouse

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September 8, 2006

SUBJECT: WESTINGHOUSE SNM-1107 LICENSE RENEWAL REQUEST FOR ADDITIONAL INFORMATION RESPONSES (TAC 31911)

The following enclosure and attachments are being provided by Westinghouse Electric Company (WEC) in response to the NRC License Renewal Application Request for Additional Information dated August 10, 2006. Specifically, the enclosure addresses RAI questions 6-2 and 6-3. LTR-EHS-05-440, Revision 1 has been generated to address RAI question 6-4, LTR-EHS-06-238 has been generated to address RAI question 6-5, and LTR-EHS-06-239 has been generated to address RAI question 6-6.

After you have reviewed the responses, WEC looks forward to discussing any additional questions or concerns with you over the phone or at the Columbia Fuel Fabrication Facility (CFFF). Based on these discussions, a mutually agreed to schedule will be determined for submittal of the revised license application incorporating the appropriate revisions.

Sincerely,

Nancy Blair Parr

Nancy Blair Parr
Licensing Manager

Enclosure 1: Response to License Renewal Application RAI Questions

cc: U. S. Nuclear Regulatory Commission
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Responses to License Renewal Application RAI Questions

Chapter 6: Nuclear Criticality Safety

6-2. WEC will revise the current wording in Chapter 6, Section 6.1.8 as follows:

"If the CAAS is out of service, within one hour suspend the movement and processing of fissile material in the coverage area until the process is brought to a safe shutdown condition. Movement of fissile material necessary to establish or maintain a safe shutdown condition may continue. Movement and processing of fissile material will not resume unless the CAAS is returned to service, or continuously attended portable detection instruments, capable of detection and alarm, are provided to monitor the area normally covered by the installed CAAS. These actions will be directed and enforced by the plant emergency response team. The portable detection and alarm devices shall be of a type pre-approved for this use by the Nuclear Criticality Safety Function. Once the installed CAAS is returned to service, the monitoring provided by the portable devices may be discontinued. Routine testing, calibration, and/or maintenance of the CAAS for up to four hours are permitted without suspension of fissile material movement or processing."

The "within one hour" suspension period is based on a common interpretation of an immediate action. Exclusion is provided for those systems (such as recirculation of SNM-bearing liquid through activity monitors, or hydrolysis column purge) which require some limited movement of fissile material to establish or ensure a safe shutdown condition. As noted in our previous response, immediate cessations of some activities are a higher risk than the risk posed by an inoperable CAAS. The SRP recognizes this situation in Section 5.4.3.4.3 where it states: "The applicant commits to rendering operations safe, by shutdown and quarantine if necessary, in any area where CAAS coverage has been lost and not restored within a specified number of hours. The number of hours should be determined on a process-by process basis, because shutting down certain processes, even to make them safe, may carry a larger risk than being without a CAAS for a short time."

6-3. In the RAI dated April 14, 2006, the NRC staff requested that WEC provide the following data for each major process area and for each controlled or uncontrolled parameter: 1) the nominal value of the parameter, 2) the value of the parameter assumed in the NCS calculations, 3) the k_{EFF} corresponding to the nominal value of the parameter, and 4) the k_{EFF} corresponding to the value of the parameter assumed in the NCS analyses. Currently, most of these data are not readily available at the CFFF, since quantifying these parameter values and k_{EFF} margins is not required.

Instead, per SNM-1107, calculations are performed for each process area to demonstrate that the calculated k_{EFF} for normal and anticipated upsets is less than 0.95, and that the calculated k_{EFF} for credible abnormal events is less than 0.98. A graded approach is used to meet these criteria, which did not result in calculations of nominal NCS parameters and associated k_{EFF}s.

Quantification of the conservative margin in k_{EFF} was not deemed of interest for several reasons:

- The graded approach currently employed at the CFFF demonstrates that the k_{EFF} corresponding to nominal conditions in each system (i.e., all NCS parameters at nominal values or worse) is less than 0.95 without quantifying the nominal values of every individual NCS parameter.

- Identification and quantification of nominal values for all process parameters would require significant effort, since measurement techniques are not currently in place at the CFFF to assess all of these parameters. For most process variables, bounding credible values are assumed in the NCS analyses instead.

- No benefit was seen in the quantification of k_{EFF} margins between nominal and upset conditions, since the magnitude of a change in k_{EFF} is not indicative of system safety. For example, a cylindrical favorable geometry vessel (FGV), with an adequate design to prevent corrosion or bulging, could result in a k_{EFF} of 0.98, while a bulk container of dry oxide could result in a k_{EFF} of 0.50. Although the margin in k_{EFF} for the FGV is much smaller, it is actually safer since no upset could result in a higher k_{EFF} (while adding water to the bulk container would drastically increase k_{EFF}).

- The nominal conditions in most CFFF processes would involve systems that lie outside of the validated area of applicability of the criticality safety codes (e.g., very dry systems, low fissile densities, etc.).

- Calculated k_{EFF}s for nominal conditions would be much less than 1.0 and current criticality safety codes are not designed to calculate eigenvalues that are significantly different from unity. In other words, the accuracy of calculating k_{EFF}s much less than 1.0 has not been quantified.

Based on the points above, WEC does not believe that the quantification of conservative margin in k_{EFF} would provide any benefit to the plant safety basis, nor provide any meaningful insight into actual safety margins at CFFF. In addition, WEC estimates that the quantification of these data would require two to three man-years of effort, and would significantly delay other safety initiatives at the CFFF.

The ongoing NCS Improvement Project (NCSIP) at the CFFF is currently reconstituting the entire NCS technical safety basis at the CFFF, using modern calculational techniques and modern code validations. These new NCS analyses will eventually replace all existing safety bases at the CFFF, and provide additional assurances that all processes have calculated k_{EFF}s that meet both the 0.95 and 0.98 criteria.