March 6, 2000

Mr. J. H. Swailes
Vice President of Nuclear Energy
Nebraska Public Power District
P. O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MA7758)

Dear Mr. Swailes:

By letter dated December 22, 1999, Nebraska Public Power District's (NPPD's) requested a license amendment proposing a revision to the design basis accident radiological assessment calculational methodology. The staff has reviewed NPPD's submittal and requires additional information to complete its review. These questions were discussed with your staff via telephone conferences on January 19, February 15, and February 24, 2000, and it was agreed that your response would be provided within 21 days of the date of this letter. The staff's request for additional information is enclosed.

If there are any questions concerning this issue, please contact me at (301) 415-3053 or ljb@nrc.gov.

Sincerely,

/RA by R. A. Gramm Acting For/

Lawrence J. Burkhart, Project Manager, Section 1
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure: As stated

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

COOPER NUCLEAR STATION

AMENDMENT PROPOSING REVISION TO

DESIGN BASIS ACCIDENT DOSE CALCULATIONS

1. Although the nuclides of interest in design bases accident analyses reach equilibrium values early in a fuel cycle, extended burnups can affect the core inventory. A substantial fraction of the energy produced during the final fuel irradiation cycle may be derived from Pu-239. The most significant difference in terms of radiological analyses is approximately 27 percent greater I-131 yield from Pu-239 fissions as compared with that for U-235 fissions. TID-14844 values were based upon a simplified formula that did not consider nuclide ingrowth. Because of these considerations justify the AXIDENT source term for the extended burnup fuel design to which it is being applied. Please insure that the AXIDENT source term is conservative with respect to the limiting design parameters of the fuels to be used (including the GE14 fuel) or modify the source term to be consistent with the most limiting fuel design. If another source term is used in this analysis please provide details about how the source term was generated.

2. Page 16 of 108 of calculation NEDC 99-033, "Control Room, EAB, and LPZ Doses Following a LOCA," assumes single failure of the filter heater power. An operator action is credited to shut off the train with the failed filter power at 1 hour. Provide justification for the operator's action. This justification should identify the procedures that direct this operator's action, and the indication the operator uses to identify the failed train.

3. Please clarify whether no mixing or partial mixing in the secondary containment is modeled in the radiological dose analyses.

4. The Cooper Ventilation Filter Testing Program that tests ESF filters allows a system bypass of less than 1% for in place tests. The Cooper radiological analyses do not consider this bypass. This seems non-conservative. Please justify this apparent non-conservatism or model it in your analyses.

5. On page 13 of 28 in calculation NEDC 99-034, "Control Room, EAB, and LPZ Doses Following a CRDA," please clarify assumption 6.16. This assumption states that the Control Room isolation is ignored in the analysis. Other parameters in the analysis infer isolation of the Control Room. In your clarification please state at what point the isolation is credited.

6. In the radiological analyses used to support the proposed change credit is taken for plateout on the condenser. Per page 8 of 108 of NEDC 99-033, it is inferred that the condenser credited is a non-seismic condenser. The staff is not aware of situations where non-seismic steam line piping and condensers are credited for iodine removal. After an extensive review, the staff has previously approved a methodology that credits iodine removal after a Safe Shutdown Earthquake. This methodology is given in "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," NEDC-31858P-A. Please justify why this standard methodology is

not used for crediting iodine removal for your application. Also, please justify the methodology used.

7. Cooper used NEDO-31400 to remove the main steam line radiation monitor (MSLRM) scram function and main steam isolation valve (MSIV) isolation function. As part of that review the impact of bypassing the offgas treatment system until late in the power ascension should have been addressed per NEDO-31400. The source term for Cooper at that time was smaller than the proposed TID source term. If Cooper's operating procedures continue to allow bypassing of the offgas treatment system until late in the power ascension the impact of the new source term needs to be addressed. Are the offgas pretreatment and post-treatment radiation monitors currently utilized to isolate the offgas treatment line and/or the offgas process line before the acceptable release rates are exceeded? If this condition applies at Cooper, then these monitors should automatically isolate the process line. Please note that according to NEDO-31400, plants that do not have the capability to bypass the treatment system do not have the additional requirement of automatic isolation of the process line.

8. Page 12 of 108 of calculation NEDC 99-033 , "Control Room, EAB, and LPZ Doses Following a LOCA," identifies an extrapolation factor formula for laminar flow taken from ORNL-NSIC-5 (page 10-52). The staff is not aware that this formula has been previously utilized by the staff to determine MSIV leakage. If this methodology has not been previously accepted by the staff, further justification will be needed to evaluate its acceptability. Please provide any information regarding past utilization and acceptance of this methodology by the staff.

9. The radiological analysis takes credit for alternate source term insights (NUREG-1465). Unless the amendment is filed under 10 CFR 50.67, the insights of TID-14844 should be used (or your current licensing basis). If TID-14844 is used, the timing aspects of the source term being instantaneously available should be considered in the modeling of the accident. For example, any delayed actuation of the standby gas treatment system or control room HVAC [heating, ventilation, and air conditioning] should be considered. Please indicate which source term methodology will be used and make the analyses consistent with this choice.

The following questions address the dose calculations regarding the fuel handling accident:

10. On page 7 of 8 in calculation NEDC 99-032, "Control Room Habitability and Offsite Dose for a Fuel Handling Accident," it is stated that Scientech's calculated Control Room doses are increased 5% to conservatively bound modeling inaccuracies or future uncertainties. How was the 5% value determined?

11. NEDC 99-032, "Control Room Habitability and Offsite Dose for a Fuel Handling Accident," takes credit for 72 hours of decay. The current basis for Technical Specification 3.9.6 states that the decay time is a minimum 24 hours. By what means is the decay time controlled to be 72 hours or greater?

12. On page 6 of 161 in calculation NEDC 99-032, "Control Room Habitability and Offsite Dose for a Fuel Handling Accident," the radionuclide release is 0.76 times the release from an FHA [fuel-handling accident] in a core of all 7x7 fuel bundles. Does this at a minimum equate to the release from the failure of all the fuel rods in one GE14 fuel bundle?

13. In NEDC 99-032, “Control Room Habitability and Offsite Dose for a Fuel Handling Accident,” “effective” X/Qs are determined for the control room. How does the final dose result compare to using control room X/Qs based on the site meteorological data?

The following questions address the dose calculations regarding the main steam line break accident:

14. On page 12 of 37 in calculation NEDC 99-035, “Dose Calculation for Control Room, EAB, and LPZ for a MSLB,” the flashed fraction of the liquid coolant is determined by assuming a constant enthalpy process. Why was the starting point for the calculation assumed to be 1000 psia instead of the normal operating pressure of 1054.7 psia?

15. Why was the control room dose due to the main steam line break accident not determined for a reactor coolant specific activity spike of 4.0 µCi/gm Dose Equivalent I-131?

The following questions address the meteorological data:

16. Provide an overall evaluation of the quality of the meteorological data used in your December 22, 1999, submittal. Did the overall meteorological program meet the guidelines of Regulatory Guide 1.23, “Onsite Meteorological Programs”? If there were deviations, describe why the data were still deemed to be adequate to use in the analyses. The intent of this question is to assess the overall quality of the data. A detailed review of each data point is not expected.

17. Was delta-T data recovery during 1995 and 1996 below 90%? Throughout the 5-year period, were there occurrences of very unstable conditions, as defined by the delta-T measurements, during night time hours? If so, to what is this attributed?

18. With respect to control room X/Qs, what is the basis for assuming a diffuse release from the turbine building? From where would releases be most likely to occur (vents, doors, and other potential openings to the environment)?

19. With respect to the main steam line break assessment, what is the basis for assuming a puff release to the environment? Provide further details in the comparison between assuming a uniform and Gaussian distribution within the puff resulting in essentially the same integrated X/Q. What assurance is there that the effluents will all pass relatively quickly as a puff?

20. Are design flow rates and isolation times based on Technical Specification values?

21. For the fuel handling accident, what assurance is there that the air around the control room intake will be essentially free from effluents as soon as the release is routed to the standby gas treatment system (SGTS), that is, that the X/Q will instantaneously drop to 10E-9 sec/cu m?

22. In several calculations the wind speed is assumed to be 1m/s. Approximately what percent of the time does this occur?