UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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APPLICANT: Babcock & Wilcox Company

FACILITY: Commercial Nuclear Fuel Plant
Lynchburg, Virginia

SUBJECT: REVIEW OF LICENSE AMENDMENT APPLICATION DATED JANUARY 9, 1980, AND ITS SUPPLEMENT DATED JUNE 12, 1980

REVIEWER: N. Ketzlach

I. Background

The Babcock & Wilcox Company, Commercial Nuclear Fuel Plant (CNFP), by application dated January 9, 1980, and supplements dated May 6, May 22, and June 12, 1980, requested authorization for the following:

1. Revision of action level for airborne concentration of radicactivity in the fuel-rod-end welding area.

2. Revision of action level for liquid effluent release.

3. Revision of surface survey frequency for lunchroom and locker room areas.

4. Revision of interaction criteria between fuel assembly storage and shipping container loading areas.

5. Reorganization within the Safety, Licensing, and Safeguards and Nuclear Materials Control Group.

The May 6 and 22, 1980, supplements were withdrawn and replaced by the June 12, 1980, supplement to clarify the assigned page revision numbers and related dates and the interaction criteria for fuel assembly storage and shipping container loading area arrays.

II. Discussion

A. Radiological Safety

1. The CNFP has taken corrective action in the fuel-rod-end welding area when the airborne concentration has exceeded 1% of the MPC in Appendix B, Table 1 of 10 CFR 20. Operations in the fuel-rod-end welding area have indicated it is not practicable to maintain localized airborne concentrations to 1% MPC. The CNFP has requested authorization to increase the action level to 5% MPC. A demonstration was provided to show that surface contamination levels in the area meet the required criteria for uncontrolled areas while the airborne concentration is maintained below 5% MPC.

The action level of 5% MPC is lower than that authorized at other licensed facilities and meets the criteria specified in 10 CFR 20.103(b)(1).

2. The CNFP releases liquid effluent to unrestricted areas after passing through a retention tank to assure releases meet the criteria of Appendix B, Table II of 10 CFR 20. When the concentration in the liquid effluent has reached 6% MPC, an investigation has been conducted to determine the probable cause and corrective action taken. An ultrafiltration system has been installed to remove uranium particulate matter from certain liquid streams entering the retention tank. Releases to the environment have been reduced by a factor of about three since installation of the ultrafiltration system.

During normal operations, the self-dilution of all the liquid waste streams that enter the retention tank is adequate to reduce the liquid effluent to 6% MPC. However, there are times when the liquid from the ultrafiltration system is the only input to the retention tank. Under these conditions, the concentration of radioactivity in the retention tank could reach 20% MPC. The CNFP has requested authorization to increase the action level for liquid effluents from 6% to 20% MPC. The action level at 20% MPC is comparable to that authorized at other licensed facilities. Therefore, the increase in action level from 6% to 20% MPC is justified.

3. The CNFP conducts smear surveys of the lunchroom and locker rooms when they are in use. A demonstration has been provided that shows surface contamination levels in the lunchroom and locker rooms have been 4 dpm/100 cm^2 or less even during normal powder processing operations. Therefore, CNFP requests authorization to survey the lunchroom and locker rooms daily only when powder processing operations are being conducted and weekly at other times. Based on the demonstration presented, the request is justified.

B. Nuclear Criticality Safety

Authorization has been requested to reduce the spacing between the fuel assembly shipping container area and the fuel assembly storage area. The spacing between the two areas was sufficiently large so that neutron

interaction between them could be neglected. It was demonstrated previously that a minimum of 38 inches center-to-center separation between nearest assemblies in adjacent planar or linear arrays of fuel assemblies in the storage area was adequate to prevent criticality by any credible supply of water from the sprinklers or from hoses used in the fighting of a fire. It was also demonstrated previously that an infinite array of loaded fuel assembly shipping containers was subcritical under all degrees of water moderation and reflection. The minimum spacing between fuel assemblies in adjacent containers is 18 inches. This distance corresponds to a center-to-center distance of 38 inches between containers. Although it may be non-conservative to assume the two array types would be safe when separated by a center-to-center distance of 38 inches between nearest fuel assemblies in the two array types, it is conservative to assume the two array types would be safe when separated by an edge-to-edge distance of 38 inches between nearest assemblies in the two array types. An added safety factor is incorporated in the relative position of assemblies in the two array types. There is less interaction between the vertical assemblies in the storage arrays and the horizontal assemblies in the shipping containers than there would have been if the assemblies in both arrays were vertical. Therefore, the authorization to remove the isolation criteria between the two array types and limit the minimum edge-to-edge spacing between nearest assemblies in each array type is justified.

The reorganization related to the removal of the Safeguards responsibilities from the Health-Safety and Licensing Group does not remove any health-safety functions from the latter. Therefore, the health-safety functions, responsibilities and controls are not compromised by the change in organization. All nuclear materials control functions are in a new Safeguards Group.

C. Environmental Effects

The increase in action level for liquid effluents to unrestricted areas from 6% to 20% MPC will have no significant effect on the environment (see discussion above under II.A.2,"Radiological Safety").

D. General

The amendment application was discussed on May 22, 1980, with W. J. Millsap, Region II (IE), Health and Safety Inspector of the CNFP facility, and with G. P. Coryell, Region II (IE), Project Inspector of the CNFP, on June 23, 1980. They foresaw no safety or environmental-related problems with the license amendment request.

E. Conclusion

The changes in action level for airborne concentration of radioactivity in the fuel-rod-end weld area, in the action level for liquid effluent release, and in the survey frequency in the lunchroom and locker room areas

are consistent with good radiation safety practices. The proposed revision of the interaction criteria between fuel assembly storage and shipping container loading areas does not compromise nuclear criticality safety. The reorganization related to the removal of the Safeguards responsibilities from the Health-Safety and Licensing Group does not remove any of the latter's health-safety functions. Therefore, the requested changes are adequate to protect the health and safety of the operating personnel, the public and the environment.

Issuance of the license amendment is recommended.

Norman Ketzlach

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Approved by: W. T. Crow

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