

PDR

70-1201

Babcock & Wilcox

Commercial Nuclear Fuel Plant

P.O. Box 800, Lynchburg, Va. 24505

Telephone: (804) 384-5111

June 12, 1980

Mr. L. C. Rouse, Chief
Fuel Processing & Fabrication Branch
Office of Nuclear Material Safety & Safeguards
United States Nuclear Regulatory Commission
Washington, D. C. 20555

REFERENCES: (1) SNM-1168, Docket 70-1201
(2) Amendment Application No. 79-3, dated January 9, 1980

SUBJECT: Amendment Application No. 79-3

Gentlemen:

The Babcock & Wilcox Company Commercial Nuclear Fuel Plant requests amendment of License Number SNM-1168 as previously discussed with members of your staff. Additional information was needed for the amendment request of 1-9-80 and as a result various pages were subsequently resubmitted on May 6, 1980 and May 22, 1980. The May 6 and May 22 submittals, however, did not meet your recordkeeping requirement needs in terms of page revision numbers, and as a result we are replacing the May 6 and May 22 documents with this submittal and indicating revision numbers accordingly. Only those pages that were revised from the January 9, 1980 application are included with this letter and are dated 6-12-80, and revision numbers are incremented by 1 (one) above the revision number indicated on the January 9, 1980 application. Thus, the enclosed revision index lists those pages which would be in effect upon approval of this amendment request. This should alleviate confusion surrounding page dates and page revision numbers for this submittal. The \$1400 minor safety amendment licensing fee as required by 10 CFR 170 was included in the January 9, 1980 submittal (B&W Check Number 23345).

The areas addressed in this amendment request are as follows:

- Revision of action levels for air effluent releases to unrestricted areas. Revised levels are needed in order to allow for routine localized operations involving pellets outside the controlled area. A series of detailed controlled experiments were performed to determine appropriate controls for maintaining airborne concentrations in such areas as low as reasonably achievable. During the two calendar quarters that the experiments were performed, extensive surface contamination surveys were conducted in the area. Results of these surveys revealed no new health and safety concerns since existing controls and limits for the uncontrolled area were not exceeded. Based on these tests and experiments, the most effective air-capture technique was selected for implementation, and we are therefore requesting a corresponding revision of the action level.

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- Revision of isolation criteria between fuel assembly storage array and fuel assembly shipping container loading area. Sections III and V of SNM-1168 presently address the fuel assembly processing and storage area as a single array, with other arrays isolated from it. Due to limited existing floorspace and the potential need to expand the fuel assembly storage capacity, the fuel assembly shipping container loading area will need to be located closer to the assembly storage rack.

Section 7.10.3 of Section V of SNM-1168 states that fuel assemblies in adjacent containers will be separated by not less than 18 inches edge to edge. Pages 184-193 and 196-200 in Section III of SNM-1168 demonstrates the safety of an infinite array of fuel assemblies and an infinite array of damaged shipping containers respectively. Results show that under all credible conditions the shipping container array is the more reactive of the two. The minimum required spacing between fresh fuel assemblies in adjacent Model B fresh fuel shipping containers of 18 (eighteen) inches edge to edge corresponds to a center to center spacing between the loaded adjacent Model B fresh fuel shipping containers of 38 (thirty-eight) inches.

Therefore, 18 inches edge to edge separation between assemblies in adjacent containers is equivalent to the 38 inches center to center distance between two loaded Model B fresh fuel shipping containers. Thus, 38 inches edge to edge separation between the storage array and the loading area will provide acceptable nuclear interaction control. Any activity equally or less reactive than the loaded shipping containers may be conducted at the same separation distance away from the fuel assembly storage rack.

- Revised contamination survey frequency. Presently, we are required to perform daily surveys of the lunchroom and locker-room areas even during periods of plant shutdown and vacation. Data from previous quarters consistently show that contamination levels at the lunchroom area during normal powder processing operations have been near zero or at the minimum detectable level as shown below.

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	Smear Survey Average	Total Survey Average
1st quarter 1979	4.3 DPM/100 cm ²	< 100 DPM/50 cm ²
2nd quarter 1979	2.6 DPM/100 cm ²	< 100 DPM/50 cm ²
3rd quarter 1979	< 1 DPM/100 cm ²	< 100 DPM/50 cm ²
4th quarter 1979	0.0 DPM/100 cm ²	< 100 DPM/50 cm ²
1st quarter 1980	0.0 DPM/100 cm ²	< 100 DPM/50 cm ²

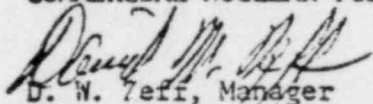
The data summary above clearly shows that such areas do not have a meaningful potential for contamination. The controls placed on personnel and equipment exiting the controlled area effectively precludes contamination spread, and therefore the associated survey frequency could be relaxed without sacrificing employee health and safety.

- Reorganization within the Safety, Licensing, and Safeguards and Nuclear Materials Control Group. The Safety, Licensing, and Safeguards Group is now known as Health-Safety and Licensing, and Nuclear Materials Control is now called Safeguards. The Safeguards Group still maintains the NMC function and licensing and health-safety matters are still controlled under the Health-Safety and Licensing Group. Most of the page changes relevant to the reorganization were made with the January 9, 1980 submittal. However, Page 25 of Section V (originally submitted on 1-9-80) required additional clarification and as a result is included with this amendment request.
- Withdrawal of certain pages from the January 9, 1980 submittal. Pages 182 and 194 of Section III of SNM-1168 originally included in the 1-9-80 application are being taken out of the submittal. Both pages remain at revision 0, dated 4-30-75, with no requested changes to either page.

If you or members of your staff have any questions regarding the above items, please feel free to call me or Mr. J. P. Watters at (804) 384-5111.

Sincerely,

BABCOCK & WILCOX COMPANY
COMMERCIAL NUCLEAR FUEL PLANT


D. W. Jeff, Manager
Health-Safety & Licensing

DWZ:cmm

cc: J. P. Watters w/attachment
W. F. Heer w/o attachment

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III	5	0	4/30/75	5	1	1/09/80	Change to Health-Safety and Licensing
III	114	0	4/30/75	114	1	1/09/80	Change to Health-Safety and Licensing
III	123	0	9/19/75	123	1	1/09/80	Change to Health-Safety and Licensing
III	195	0	4/30/75	195	2	6/12/80	Revised interaction
IV	13 - 14	0	4/30/75	13 - 14	1	1/09/80	Change to Health-Safety and Licensing
IV	38	0	4/30/75	38	1	1/09/80	Change to Health-Safety and Licensing
IV	40	0	9/19/75	40	1	1/09/80	Change to Health-Safety and Licensing
V	2	1	8/11/78	2	2	1/09/80	Change- UO_2 to Uranium Oxide
V	11 - 12	0	4/30/75	11 - 12	1	1/09/80	Change to Health-Safety and Licensing
V	13	0	9/19/75	13	1	1/09/80	Change to Health-Safety and Licensing
V	14	0	12/01/75	14	1	1/09/80	Change to Health-Safety and Licensing
V	17	0	4/30/75	17	1	1/09/80	Change to Health-Safety and Licensing
V	24	0	4/30/75	24	1	1/09/80	Change to Health-Safety and Licensing
V	25	0	4/30/75	25	2	6/12/80	Change to Health-Safety and Licensing
V	26	1	10/13/78	26	2	1/09/80	Change to Health-Safety and Licensing
V	27	0	9/19/75	27	1	1/09/80	Change to Health-Safety and Licensing
V	32	0	4/30/75	32	1	1/09/80	Change to Health-Safety and Licensing
V	34 - 35	0	12/01/75	34 - 35	1	1/09/80	Change to Health-Safety and Licensing

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V	36	0	9/19/75	36	1	1/09/80	Change to Health-Safety and Licensing
V	40	0	12/01/75	40	1	1/09/80	Change UO ₂ to Uranium Oxide
V	69	0	12/01/75	69	2	6/12/80	Revised interaction
V	70	0	12/01/75	70	2	6/12/80	Revised interaction
V	76	0	4/30/75	76	2	6/12/80	Air action level change
V	77	0	4/30/75	77	1	1/09/80	Water action level change
V	84	0	4/30/75	84	1	1/09/80	Change to Health-Safety and Licensing
V	94	4	5/25/79	94	5	1/09/80	Add "*" for clarity

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SECTION III NUCLEAR SAFETY ANALYSIS

7.10 Fuel Assembly Storage

7.10.2 Continued

processing area, where four foot separation is maintained, is likewise subcritical. Two or more planar arrays have been shown to be subcritical in combination when center-to-center distance is not less than 38 inches, and with major faces opposed, the situation resulting from consideration of an infinite storage array.

Nuclear interaction between assembly storage and assembly shipping container loading is limited to the interaction associated with an array of damaged loaded shipping containers. The evaluation of damaged shipping containers (Pages 190-201 of section III) shows that the containers are nuclearly safe with edge-to-edge spacings of 14 and 8 inches (see Figure 2 on Page 197). The fuel assembly storage rack is also shown to be safe based on 21" x 38" center-to-center spacing as stated in the criticality evaluations on Pages 184-195 of Section III. The minimum required edge-to-edge spacing of 18" between assemblies in adjacent shipping containers (see Section V, Page 70) corresponds to a 38" center-to-center spacing between the loaded adjacent Model B containers. Thus, 38 inches edge-to-edge separation between the fuel assembly storage array and the fuel assembly loading area is conservative and will provide acceptable nuclear interaction control. ***

Rotation of one planar array 90 degrees from the vertical to present its edge to the face of the opposing array, while maintaining the specified separative distances, significantly reduces interaction probabilities by presenting less "effective" surface area for interaction thus, in effect, extending the effective separation distance. This demonstration accurately reflects conditions at the junction of the fuel assembly processing and storage area, and also at the junction of the assembly storage and shipping container loading area. ***

Under normal operating conditions the activities will be conducted in the absence of any significant moderation; under such conditions, fuel of 4 wt.% enrichment and less cannot be made critical.

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SECTION V CONDITIONS

6.0 General Specifications

6.6 Procedure Control (continued)

- Procedures developed by Health-Safety specifying the method by which safety related functions are to be accomplished. Such procedures may be for internal Health-Safety use or may be intended for general distribution to affected individuals within other components. Health-Safety procedures shall be approved in writing by the Plant Manager, the Manager, Health-Safety and Licensing, and other members of plant management/supervision if it is determined by Health-Safety that their area of responsibility is affected by the procedure. ***

- Safeguards procedures provide techniques for the accountability and measurement of SNM. Such procedures will be approved in writing by the Manager, Health-Safety and Licensing and by affected plant management. ***

- Manufacturing, Quality Control, and selected Maintenance/Engineering procedures, where nuclear or radiological safety, license conditions, or regulatory requirements are involved require prior approval by the Manager, Health-Safety and Licensing, as well as approval by affected members of plant management. ***

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SECTION V CONDITIONS

7.0 Nuclear Safety - Technical Specifications

7.9 Fuel Assembly Processing (cont'd)

7.9.1 Continued

accumulation of fuel rods once the fuel rods have been removed from the geometric safe 4.0" slab.

A minimum separation of 4 feet will be maintained between bundle assembly stations, and the equipment will be such that liquids cannot be retained in and around the in-process operation.

7.9.2 Assembly processing operations once the fuel rods are restrained in the fuel assembly configuration may be performed without moderation control. The assemblies will be separated by at least 36" center-to-center.

7.9.3 For the purposes of nuclear interaction control, the fuel assembly processing and fuel assembly storage arrays are considered as a single array with adjacent arrays being no more reactive than an array of fuel assemblies loaded in adjacent containers as described in Part 7.10.3 of Section V.

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7.10 Fuel Assembly Storage and Packaging

7.10.1 Fuel assembly dust wrappers, if used, will be arranged to permit drainage of water from within. Moderation, such as polyethylene, etc., will not be permitted within the assemblies.

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SECTION V CONDITIONS

7.0 Nuclear Safety - Technical Specifications

7.10 Fuel Assembly Storage and Packaging (continued)

7.10.2 Fuel assemblies may be stored in racks meeting the following spacing criteria:

- a. Fuel assemblies in linear arrays will have minimum 21" center-to-center spacing.
- b. Fuel assemblies in planar arrays will be arranged on minimum 36" x 36" center-to-center spacing.
- c. A minimum of 38" center-to-center spacing will be maintained between the nearest assemblies of adjacent planar or linear storage arrays.

The following restrictions shall be imposed on fire fighting within the assembly storage array:

- a. The use of hoselines shall be prohibited unless authorization has been received from a management representative of the plant emergency response organization.
- b. Area postings will be maintained at the array perimeter specifying limitations on fire fighting techniques.
- c. Simultaneous application of more than one hoseline is not authorized.

7.10.3 Fuel assembly packaging and unpackaging operations involving licensed Model B shipping containers will be performed within the following limitations:

- a. Fuel assembly packaging will be in accord with the requirements of the container certificate.
- b. Fuel assemblies in adjacent containers will be separated by not less than 18 inches edge-to-edge.
- c. The edge-to-edge separation between fuel assemblies in the storage rack and assemblies in shipping containers shall be greater than or equal to the minimum center-to-center distance between loaded shipping containers (38 inches).

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SECTION V CONDITIONS

8.0 Technical Specifications - Radiation Safety

8.1 Effluents to Unrestricted Areas

8.1.1 Continued

- c. The following program shall be instituted to assure that airborne releases to uncontrolled areas are maintained as low as practicable:

Quarterly Average - % of 10 CFR 20
Appendix B, Table 2

LIMIT	ACTION
≤ 10% of "MPC"	None required.
11 - 20%	Conduct investigation of system and correct if possible.*
21 - 75%	Visually inspect system. As soon as practicable, conduct efficiency test. Determine and correct cause.**
> 75%	Conduct immediate investigation to determine and correct problem in ventilation system. Maintain additional Health-Safety surveillance of system to monitor contamination levels until problem is corrected.

*end weld operation area - None required
**end weld operation area - None required at ≤ 50% MPC

Health-Safety shall maintain records of investigations and actions resulting therefrom.

- d. Pre-filters serving equipment in the pelletizing area will be instrumented and monitored as specified in 8.1.1a above.

8.1.2 Potentially contaminated liquid effluents will be controlled through a retention tank system with dilution and mixing capabilities and shall be evaluated

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