SECY-99-069

March 5, 1999

FOR: The Commissioners

FROM: William D. Travers /s/
Executive Director for Operations

SUBJECT: EXEMPTION FROM 10 CFR 72.212 AND 72.214 CONDITIONS OF USE FOR THE VSC-24 DRY STORAGE CASK AT THE ARKANSAS NUCLEAR ONE INDEPENDENT SPENT FUEL STORAGE INSTALLATION

PURPOSE:

To request, by negative consent, Commission approval of the staff's intent to inform Entergy Operations, Inc. (Entergy), of its finding that an adequate safety basis supports granting an exemption from the 10 CFR 72.212(a)(2) general license conditions and 10 CFR 72.214 Certificate of Compliance (COC) conditions to store burnable poison rod assemblies (BPRAs) in the Ventilated Storage Cask-24 (VSC-24) system at the Arkansas Nuclear One (ANO) Independent Spent Fuel Storage Installation.

BACKGROUND:

ANO is a general licensee under 10 CFR Part 72 that uses the Sierra Nuclear Corporation (SNC) VSC-24 system to store spent fuel. Eight VSC-24s have been loaded at the ANO site; six of the casks contain Combustion Engineering 16x16 fuel from the ANO Unit 2 (ANO-2) spent fuel pool (SFP) and two of the casks contain Babcock and Wilcox (B&W) 15x15 fuel from the ANO Unit 1 (ANO-1) SFP. The ANO-2 SFP currently has enough space to fully offload the fuel in the ANO-2 reactor core. However, the ANO-1 SFP does not have a full core offload reserve. The ability to fully offload the reactor core is not a regulatory requirement but an operational consideration that the staff supports to maintain operational flexibility.

Currently, the COC for the VSC-24 does not approve the storage of BPRAs. On December 30, 1998, SNC submitted a COC amendment request to specifically store B&W 15x15 fuel containing BPRAs in VSC-24s. On January 18, 1999, Entergy requested an exemption from the requirements in 10 CFR 72.214 regarding the conditions specified in the COC for the VSC-24 contents at ANO to allow for the storage of BPRAs. For the staff to grant the exemption from 10 CFR 72.214, we must also grant ANO an exemption from the general license conditions of 10 CFR 72.212(a)(2). Section 72.212(a)(2) states that the general license for storage of spent fuel at power reactor sites is limited to storage of spent fuel in casks approved under the provisions in 10 CFR Part 72. By exempting ANO from both 10 CFR 72.214 and 72.212(a)(2), ANO will be authorized to use its general license to store spent fuel in casks approved under Part 72, as exempted, to allow storage of BPRAs.

The staff has completed its technical review of the December 30, 1998, SNC amendment request and will soon be proceeding with rulemaking to add this amendment of COC No. 1007 to the list of approved casks in 10 CFR 72.214. The staff estimates that rulemaking will not be completed until January 2000. Entergy requested the exemption to allow loading of BPRAs by May 1, 1999.

DISCUSSION:

The ANO-1 SFP currently has 117 spaces available for future fuel storage (each space in the SFP can store 1 fuel assembly). However, the ANO-1 core contains 177 fuel assemblies. During the next refueling outage, scheduled to begin in September 1999, an additional 60 fuel assemblies will be unloaded to the ANO-1 SFP (leaving 57 spaces in the SFP). Since each cask holds 24 fuel assemblies, 5 casks must be loaded prior to the September 1999 refueling outage to obtain full core offload capability. The ANO-1 and -2 SFPs are separate pools with different rack designs. Furthermore, cask loading activities cannot be performed simultaneously with refueling activities at ANO because of coincident manpower and space requirements.

ANO-1 uses BPRAs in the B&W fuel assemblies as a method to control core reactivity. A BPRA is composed of a stainless steel spider assembly and retainer mechanism, with up to 16 zircaloy-clad rods containing a neutron poison. The BPRAs are inserted into the fuel assemblies through the upper end fittings of the assembly and held in place against lift forces in the core by the retainer mechanism. Spent BPRAs are currently stored as an integral part of fuel assemblies in the ANO-1 SFP.

The ANO-1 SFP has enough fuel assemblies without BPRAs to load only one of the five casks necessary to regain full core offload reserves. The loading of these assemblies is scheduled to begin in April 1999. To meet the September 1999 refueling outage schedule, all cask loading activities must be completed by July 1, 1999. Entergy requested an exemption from the 10 CFR 72.214 conditions for cask use to load BPRAs in the remaining four casks needed by ANO-1. COC No. 1007 does not currently allow the storage of BPRAs.

Cask preparation and loading activities for each cask loaded with B&W 15x15 fuel take approximately 2 weeks. If Entergy does not receive the exemption from the staff by May 1, 1999, ANO must take actions to disposition BPRAs left in the ANO-1 SFP to continue loading casks and regain a full core offload reserve in the SFP.

Staff performed a safety evaluation and environmental assessment of the proposed exemption and found no reduction in the safety margin as a result of storing ANO BPRAs along with spent fuel in the VSC-24s.

The staff evaluated the storage of BPRAs with B&W 15x15 fuel by reviewing the SNC's COC amendment request and performing confirmatory analysis. The staff performed a detailed safety evaluation of the proposed exemption request and found that the addition of the BPRAs to the B&W 15x15 fuel does not reduce the VSC-24 safety margin.

The addition of BPRAs to the B&W fuel increases the weight of the fuel assembly from 689 kg (1,516 lbs) to 716 kg (1,576 lbs). The staff found the VSC-24 structural effectiveness adequate to safely maintain spent fuel assemblies containing BPRAs.

The thermal load of the B&W fuel assemblies (with or without BPRAs) was found to remain at a maximum of 1 kW (0.95 BTU/sec).

Only fuel with an initial enrichment below 3.3 weight percent uranium-235 is approved for storage with BPRAs in the VSC-24s. The addition of BPRAs to B&W 15x15 fuel assemblies does not change the acceptable initial enrichment for storage.

The maximum potential cask dose rates were found to increase by no more than 13 percent at any location on a loaded VSC-24 system. For a VSC-24 loaded with fuel containing BPRAs, the highest dose would be found at the top center of the cask. This dose was calculated to increase from 30 mrem/hr without BPRAs to 32.2 mrem/hr with BPRAs. Furthermore, the off-site dose rates remain well within the 10 CFR Part 20 limits.

Staff also evaluated the following possible alternatives to granting the exemption and the ramifications of each:

1. Remove BPRAs from the fuel to be loaded in casks and disassemble the BPRAs by cutting the assemblies into pieces and storing in canisters for low-level waste storage. Resulting adverse considerations would include pool cleanliness, contamination control, increased personnel dose due to handling, an increased amount of radioactive waste, and the potential for particle migration into the primary system leading to subsequent fuel failures.

2. Leave fuel with BPRAs in ANO-1 SFP. Should a situation arise that requires a full core offload prior to receiving the COC amendment, ANO would have to remove BPRAs from fuel assemblies to be loaded in casks. The BPRAs would need to be stored at the sides of the SFP, between the fuel rack and the SFP walls, for an interim period. Storage in this manner may cause the BPRAs to deform such that re-insertion into fuel assemblies at a later date would not be possible. These BPRAs would be handled as low-level waste.

3. Remove BPRAs from the fuel assemblies to be loaded in casks and store them in the SFP racks. However, BPRAs require the same amount of SFP storage space whether they are stored in an assembly or not (unless stored on the sides of the SFP, as described in Item 2 above). Removing BPRAs from the assemblies allows more casks to be loaded, but does not increase available SFP space to regain full core offload reserve. The BPRAs would eventually need to be disposed of as low-level waste, as described in Item 1 above.

4. Re-rack the SFP. Entergy has not pursued the option of re-racking the ANO-1 SFP. The last Entergy request to re-rack the ANO-1 SFP was granted by the staff on April 15, 1983.

In summary, staff has determined that the storage of BPRAs in the VSC-24 system does not pose any increased risk to public health and safety and actually decreases the potential occupational dose associated with disassembling the BPRAs from the fuel assemblies. Staff finds that the storage of BPRAs in VSC-24 systems at ANO adequately protects public health and safety and the environment.

Since the rulemaking to revise Part 72 reflecting the amended VSC-24 COC will not be completed in time to support ANO's loading schedule, staff intends to grant the exemption as requested.

To address the storage of BPRAs at other licensee sites in the short term, staff is preparing Interim Staff Guidance and an Information Notice to clarify that the storage of control components (including BPRAs) must be specifically addressed in the COC application. Furthermore, this exemption request highlights the current regulatory process requiring rulemaking to amend a Part 72 COC. To resolve the issue of the extended time it takes to amend a COC through rulemaking, staff is currently evaluating simplifying the process for amending a COC.

RESOURCES:

The Office of the Chief Financial Officer has reviewed this document and has determined that granting the exemption will have no net impact on resources.

COORDINATION:

The Office of the General Counsel has reviewed this document and has no legal objection. In addition, the Office of the Chief Information Officer has reviewed this document and has no objections to the content.

RECOMMENDATION:

Staff requests action within 10 days. Action will not be taken until the SRM is received. We consider this action to be within the delegated authority of the Director, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards.

William D. Travers
Executive Director for Operations

CONTACT: Stephen C. O'Connor, NMSS/SFPO
(301) 415-8561

Attachment: Proposed letter from W. Brach, NRC, to J. Vandergrift, ANO (w/ encl.)

Mr. Jimmy D. Vandergrift
Director, Nuclear Safety
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72801

SUBJECT: EXEMPTION FROM 10 CFR 72.212 AND 10 CFR 72.214 CONDITIONS OF USE FOR THE VSC-24 SYSTEM AT THE ARKANSAS NUCLEAR ONE INDEPENDENT SPENT FUEL STORAGE INSTALLATION (TAC NO. L22806)

Dear Mr. Vandergrift:

This is in response to your January 18, 1999, letter requesting an exemption to 10 CFR 72.214, pursuant to 10 CFR 72.7. In your letter, you request an exemption from the conditions in the Certificate of Compliance (COC) for the Ventilated Storage Cask-24 (VSC-24) system listed in 10 CFR 72.214, COC No. 1007, to allow the storage of burnable poison rod assemblies (BPRAs) in VSC-24s at the Arkansas Nuclear One (ANO) Independent Spent Fuel Storage Installation.

For the U.S. Nuclear Regulatory Commission (NRC) to grant the exemption from 10 CFR 72.214, we must also grant ANO an exemption from the general license conditions of 10 CFR 72.212(a)(2). Section 72.212(a)(2) states that the general license for storage of spent fuel at reactor power sites is limited to storage of spent fuel in casks approved under the provisions in 10 CFR Part 72. Condition 8 of COC No.1007 specifies that the approved VSC-24 system is subject to the Conditions for Cask Use (COC Attachment A). Table 1 of the Conditions for Cask Use shows the fuel assembly weight as <1516 lbs. The fuel assembly weight value would be increased to <1576 lbs for fuel with BPRAs. This letter grants your exemption request and provides the NRC's basis and conditions for the exemption.

We understand that the spent fuel pool (SFP) for ANO Unit 1 has lost full core offload (FCO) reserves. Furthermore, ANO must load four VSC-24 casks with fuel containing BPRAs to regain FCO reserves prior to the next refueling outage, scheduled for September 1999. However, COC No. 1007 does not approve the storage of BPRAs.

On December 30, 1998, SNC submitted a COC amendment request to specifically store Babcock and Wilcox 15x15 fuel containing BPRAs in VSC-24s. The staff has completed its technical review of this amendment request and has begun the rulemaking process of revising 10 CFR 72.214 to add this amendment to the approved version of COC No. 1007.

After reviewing (1) the information provided in your letter and (2) the December 30, 1998, VSC-24 COC amendment request submitted by SNC, the staff has determined that the safety basis for the storage of ANO BPRAs in the VSC-24 is adequate to grant your requested exemption. The staff reached this decision as a result of its technical review of the safety significance of storing BPRAs in the VSC-24 versus the ramifications of disassembling the BPRAs from the fuel assemblies and storing them in the SFP. A safety evaluation for the exemption request is enclosed.

NRC staff evaluated public health and safety and environmental impacts of the proposed exemption and determined that granting the exemption would not result in any significant impacts. For this action, an Environmental Assessment and Finding Of No Significant Impact have been prepared and published in the Federal Register (**XX FR XXXXX, XX/XX/99**). A copy of the Federal Register was provided to you by letter dated **XXXXX**, 1999. Based on the foregoing considerations, the staff has determined that granting the proposed exemption from the conditions of 10 CFR 72.212(a)(2) and 72.214, to permit loading of ANO BPRAs in

VSC-24s, is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. ANO is hereby granted this exemption with the condition that fuel containing BPRAs loaded in VSC-24s at ANO must not exceed the technical specifications delineated in the enclosed safety evaluation, as well as all conditions and technical specifications in the current VSC-24 COC. In addition, other conditions that must be met are as follows:

1. No more than four VSC-24s containing BPRAs will be loaded under this exemption. Future loading of BPRAs in VSC-24s will be accomplished subsequent to issuance of a revision to COC No. 1007 addressing this issue.

2. Only fuel with an initial enrichment below 3.3 weight percent uranium-235 is approved for storage with BPRAs in the VSC-24s. The SFP boron concentration should continue to be maintained at greater than, or equal to, 2850 parts per million as specified in the COC.

3. Loading of the four VSC-24s containing BPRAs must be accomplished prior to the September 1999 ANO Unit 1 refueling outage (1R15).

4. ANO must perform the 10 CFR 72.212 evaluations in accordance with the terms of the general license provisions of 10 CFR Part 72, Subpart K, prior to loading any VSC-24s containing BPRAs.

5. ANO must inform NRC within 30 days, if any of the conditions of this exemption cannot be met.

If you have any questions, please contact Mr. Stephen O'Connor of my staff at 301-415-8561. Any future correspondence related to this action should reference Docket 72-13 and TAC No. L22806.

Sincerely,

E. William Brach, Director
Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards

Dockets 72-13/-1007, 50-313

Enclosure: Safety Evaluation

cc: Service List

cc: Executive Vice President
& Chief Operating Officer
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DOCKET: 72-13

APPLICANT: Entergy Operations, Incorporated
Arkansas Nuclear One Power Plant

SUBJECT: EVALUATION OF REQUEST FOR EXEMPTION FROM 10 CFR 72.212 AND 10 CFR 72.214 CONDITIONS OF USE FOR THE VSC-24 SYSTEM AT THE ARKANSAS NUCLEAR ONE INDEPENDENT SPENT FUEL STORAGE INSTALLATION

BACKGROUND

By letter dated January 18, 1999, Entergy Operations, Inc. (Entergy), requested an exemption from the requirements in 10 CFR 72.214 regarding the conditions specified in the Certificate of Compliance (COC) for the Ventilated Storage Cask-24s (VSC-24s) at the Arkansas Nuclear One (ANO) Power Plant to allow for the storage of burnable poison rod assemblies (BPRAs). ANO Unit 1 uses BPRAs in the Babcock and Wilcox (B&W) 15x15 fuel assemblies as a method to control core reactivity. Spent BPRAs are currently stored as an integral part of fuel assemblies in the ANO Unit 1 spent fuel pool (SFP).

ANO is a general licensee under 10 CFR Part 72 and approved to use the Sierra Nuclear Corporation (SNC) VSC-24 system to store spent fuel. Eight VSC-24s have been loaded at the ANO site; six of the casks contain Combustion Engineering 16x16 fuel from the ANO Unit 2 SFP and two of the casks contain B&W 15x15 fuel from the ANO Unit 1 SFP. However, the ANO Unit 1 SFP does not have a full core offload (FCO) reserve. The ability to fully offload the reactor core is not a regulatory requirement but an operational desire of the licensee. In addition, the staff believes that it is prudent for licensees to have FCO capability for operational flexibility.

Currently, the COC for the VSC-24 does not approve the storage of BPRAs. On December 30, 1998, SNC submitted a COC amendment request to specifically store B&W 15x15 fuel containing BPRAs in VSC-24s.

DISCUSSION

The staff evaluated the storage of BPRAs with B&W 15x15 fuel by reviewing the COC amendment request submitted by SNC and performing confirmatory analysis. SNC provided additional information and revised calculations in response to the staff's requests. The staff performed a detailed safety evaluation of the proposed exemption request and found that the addition of the BPRAs to the B&W 15x15 fuel does not reduce the VSC-24 safety margin.

The addition of BPRAs to the B&W fuel increases the weight of the fuel assembly from 689 kg (1,516 lbs) to 716 kg (1,576 lbs). The overall weight of the multi-assembly sealed basket was found to increase from 28,990 kg (63,780 lbs) to 31,022 kg (68,250 lbs). The staff found the VSC-24 structural effectiveness adequate to safely maintain spent fuel assemblies containing BPRAs.

The thermal load of the B&W fuel assemblies (with or without BPRAs) was found to remain at a maximum of 1 kW (0.95 BTU/sec).

The maximum potential cask dose rates were found to increase by no more than 13 percent. Furthermore, the off-site dose rates remain well within the 10 CFR Part 20 limits.

The staff evaluated fuel with an initial enrichment below 3.3 weight percent uranium-235 for storage with BPRAs in the VSC-24s. The addition of BPRAs to B&W 15x15 fuel assemblies does not change the acceptable initial enrichment for storage. The SFP boron concentration will continue to be maintained at greater than, or equal to, 2850 parts per million as specified in the COC.

CONCLUSIONS

The staff performed a detailed safety evaluation of the proposed exemption request and COC amendment request and found that the addition of the BPRAs to the B&W 15x15 fuel does not reduce the VSC-24 safety margin. In addition, the staff has determined that the storage of BPRAs in the VSC-24 does not pose any increased risk to public health and safety.

REFERENCES

Sierra Nuclear Corporation, "License Amendment Request 98-01 to VSC-24 SAR B&W Fuel with BPRAs," 1998.

U.S. Nuclear Regulatory Commission, "Safety Evaluation Report for the Pacific Sierra Nuclear Associates Safety Analysis Report for the Ventilated Storage Cask System," 1993.

PRINCIPLE CONTRIBUTORS

Stephen O'Connor