

February 15, 2005

Mr. David A. Christian
Sr. Vice President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2, EXEMPTION FROM THE
REQUIREMENTS OF 10 CFR SECTION 50.68(b)(1) (TAC NO. MC5056)

Dear Mr. Christian:

The Commission has approved the enclosed exemption from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.68(b)(1) for the Millstone Power Station, Unit No. 2 (MP2). This action is in response to your letter dated November 5, 2004, as supplemented by letters dated January 6 and January 25, 2005, requesting an exemption from the requirements of 10 CFR 50.68(b)(1) for loading, unloading, and handling of the components of the Transnuclear NUHOMS®-32PT dry cask storage system at MP2.

A copy of the exemption has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,

/RA/

Victor Nerses, Senior Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure: As stated

cc w/enclosure: See next page

Mr. David A. Christian
Sr. Vice President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

February 15, 2005

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 2, EXEMPTION FROM THE
REQUIREMENTS OF 10 CFR SECTION 50.68(b)(1) (TAC NO. MC5056)

Dear Mr. Christian:

The Commission has approved the enclosed exemption from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.68(b)(1) for the Millstone Power Station, Unit No. 2 (MP2). This action is in response to your letter dated November 5, 2004, as supplemented by letters dated January 6 and January 25, 2005, requesting an exemption from the requirements of 10 CFR 50.68(b)(1) for loading, unloading, and handling of the components of the Transnuclear NUHOMS®-32PT dry cask storage system at MP2.

A copy of the exemption has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,
/RA/

Victor Nerses, Senior Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure: As stated

cc w/enclosure: See next page

DISTRIBUTION:

Public	RidsNrrDlpmLpdi (CHolden)	RidsOgcRp
PDI-2 R/F	RidsNrrDlpmLpdi-2 (DRoberts)	JTappert
RidsNrrPMVNerses	RidsAcrsAcnwMailCenter	SJones
CRaynor (hard copy)	RidsRgnlMailCenter (SCahill)	RTaylor
DCoe	GHill (2 copies)	TKim
		JJolicoeur

ADAMS Accession No. ML050420058

OFFICE	PDI-2/PM	PDI-2/LA	SRXB/SC	SPLB/SC(A)	OGC	PDI-2/SC	PDI/D	DLPM/D
NAME	VNerses	CRaynor	JUhle	SJones	SCole	DRoberts	CHolden	LMarsh
DATE	2/11/05	2/11/05	01/06/05	02/02/05	2/9/05	2/11/05	2/14/05	2/15/05

OFFICIAL RECORD COPY

Millstone Power Station, Unit No. 2

cc:

Lillian M. Cuoco, Esquire
Senior Counsel
Dominion Resources Services, Inc.
Building 475, 5th Floor
Rope Ferry Road
Waterford, CT 06385

Edward L. Wilds, Jr., Ph.D.
Director, Division of Radiation
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

First Selectmen
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

Charles Brinkman, Director
Washington Operations Nuclear Services
Westinghouse Electric Company
12300 Twinbrook Pkwy, Suite 330
Rockville, MD 20852

Senior Resident Inspector
Millstone Power Station
c/o U.S. Nuclear Regulatory Commission
P.O. Box 513
Niantic, CT 06357

Mr. J. Alan Price
Site Vice President
Dominion Nuclear Connecticut, Inc.
Building 475, 5th Floor
Rope Ferry Road
Waterford, CT 06385

Mr. John Markowicz
Co-Chair
Nuclear Energy Advisory Council
9 Susan Terrace
Waterford, CT 06385

Mr. Evan W. Woollacott
Co-Chair
Nuclear Energy Advisory Council
128 Terry's Plain Road
Simsbury, CT 06070

Ms. Nancy Burton
147 Cross Highway
Redding Ridge, CT 00870

Mr. Chris L. Funderburk
Director, Nuclear Licensing and
Operations Support
Dominion Resources Services, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

Mr. David W. Dodson
Licensing Supervisor
Dominion Nuclear Connecticut, Inc.
Building 475, 5th Floor
Rope Ferry Road
Waterford, CT 06385

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION, UNIT NO. 2
DOCKET NO. 50-336
EXEMPTION

1.0 BACKGROUND

Dominion Nuclear Connecticut, Inc. (DNC or the licensee) is the holder of Facility Operating License No. DPR-65, which authorizes operation of the Millstone Power Station, Unit No. 2 (MP2). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a pressurized water reactor located in New London County, Connecticut.

2.0 REQUEST/ACTION

By letter dated November 5, 2004, as supplemented by letters dated January 6 and January 25, 2005, the licensee submitted a request for an exemption from the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.68(b)(1) for loading, unloading, and handling of the components of the Transnuclear (TN) NUHOMS®-32PT dry cask storage system at MP2.

Section 50.68(b)(1) of 10 CFR sets forth the following requirement that must be met, in lieu of a monitoring system capable of detecting criticality events.

Plant procedures shall prohibit the handling and storage at any one time of more fuel assemblies than have been determined to be safely subcritical under the most adverse moderation conditions feasible by unborated water.

The licensee is unable to satisfy the above requirement for handling the 10 CFR Part 72 licensed contents of the TN NUHOMS®-32PT system. Section 50.12(a) allows licensees to apply for an exemption from the requirements of 10 CFR Part 50 if the regulation is not necessary to achieve the underlying purpose of the rule and other conditions are met. The licensee stated in the application that compliance with 10 CFR 50.68(b)(1) is not necessary for handling the 10 CFR Part 72 licensed contents of the cask system to achieve the underlying purpose of 10 CFR 50.68(b)(1).

3.0 DISCUSSION

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security, and (2) when special circumstances are present. Therefore, in determining the acceptability of the licensee's exemption request, the staff has performed the following regulatory, technical, and legal evaluations to satisfy the requirements of 10 CFR 50.12 for granting the exemption.

3.1 Regulatory Evaluation

The MP2 Technical Specifications (TSs) currently permit the licensee to store spent fuel assemblies in high-density storage racks in the MP2 spent fuel pool (SFP). In accordance with the provisions of 10 CFR 50.68(b)(4), the licensee takes credit for soluble boron for criticality control and ensures that the effective multiplication factor (k_{eff}) of the SFP does not exceed 0.95, if flooded with borated water. Section 50.68(b)(4) of 10 CFR also requires that, if credit is taken for soluble boron, the k_{eff} must remain below 1.0 (subcritical) if flooded with

unborated water. However, the licensee is unable to satisfy the requirement to maintain the k_{eff} below 1.0 (subcritical) with unborated water, which is also the requirement of 10 CFR 50.68(b)(1), during cask handling operations in the SFP. Therefore, the licensee's request for exemption from 10 CFR 50.68(b)(1) proposes to permit the licensee to perform spent fuel loading, unloading, and handling operations related to dry cask storage, without being subcritical under the most adverse moderation conditions feasible by unborated water. It should be noted that an exemption from the requirements of 10 CFR 50.68(b)(4) is not necessary because it is only applicable to the spent fuel storage racks, which have been determined to be subcritical if flooded with unborated water.

Part 50, Appendix A of 10 CFR, "General Design Criteria (GDC) for Nuclear Power Plants," provides a list of the minimum design requirements for nuclear power plants. According to GDC-62, "Prevention of Criticality in Fuel Storage and Handling," the licensee must prevent criticality in the fuel handling and storage system by physical systems or processes.

Section 50.68 of 10 CFR Part 50, "Criticality Accident Requirements," provides the NRC requirements for maintaining subcritical conditions in SFPs. Section 50.68 of 10 CFR provides criticality control requirements which, if satisfied, ensure that an inadvertent criticality in the SFP is an extremely unlikely event. These requirements ensure that the licensee has appropriately conservative criticality margins during handling and storage of spent fuel. Section 50.68(b)(1) of 10 CFR states, "Plant procedures shall prohibit the handling and storage at any one time of more fuel assemblies than have been determined to be safely subcritical under the most adverse moderation conditions feasible by unborated water." Specifically, 10 CFR 50.68(b)(1) ensures that the licensee will maintain the pool in a subcritical condition during handling and storage operations without crediting the soluble boron in the SFP water.

The licensee has received a license to construct and operate an Independent Spent Fuel Storage Installation (ISFSI) at MP2. The ISFSI permits the licensee to store spent fuel assemblies in large concrete dry storage casks. As part of its ISFSI loading activities, the licensee transfers spent fuel assemblies to a dry shielded canister (DSC) in the cask pit area of the SFP. The licensee performed criticality analyses of the DSC fully loaded with fuel having the highest permissible reactivity, and determined that a soluble boron credit was necessary to ensure that the DSC would remain subcritical in the SFP. Since the licensee is unable to satisfy the requirement of 10 CFR 50.68(b)(1) to ensure subcritical conditions during handling and storage of spent fuel assemblies in the pool with unborated water, the licensee identified the need for an exemption from the 10 CFR 50.68(b)(1) requirement to support DSC loading, unloading, and handling operations, without being subcritical under the most adverse moderation conditions feasible by unborated water.

The staff evaluated the possibility of an inadvertent criticality of the spent nuclear fuel at MP2 during DSC loading, unloading, and handling. The staff has established a set of acceptance criteria that, if met, satisfy the underlying intent of 10 CFR 50.68(b)(1). In lieu of complying with 10 CFR 50.68(b)(1), the staff determined that an inadvertent criticality accident is unlikely to occur if the licensee meets the following five criteria¹:

1. The cask criticality analyses are based on the following conservative assumptions:
 - a. All fuel assemblies in the cask are unirradiated and at the highest permissible enrichment,
 - b. Only 75 percent of the Boron-10 in the Boral panel inserts is credited,

¹The criteria have been used previously in the review of similar exemptions from the requirements of 10 CFR 50.68(b)(1) for Diablo Canyon Units No. 1 and 2 and Sequoyah Units No. 1 and 2. The evaluations for these exemptions are available in the Agencywide Documents Access and Management System under accession numbers ML040300693 and ML041540213, respectively.

- c. No credit is taken for fuel-related burnable absorbers, and
 - d. The cask is assumed to be flooded with moderator at the temperature and density corresponding to optimum moderation.
2. The licensee's ISFSI TS requires the soluble boron concentration to be equal to or greater than the level assumed in the criticality analysis and surveillance requirements necessitate the periodic verification of the concentration both prior to and during loading and unloading operations.
3. Radiation monitors, as required by GDC-63, "Monitoring Fuel and Waste Storage," are provided in fuel storage and handling areas to detect excessive radiation levels and to initiate appropriate safety actions.
4. The quantity of other forms of special nuclear material, such as sources, detectors, etc., to be stored in the cask will not increase the effective multiplication factor above the limit calculated in the criticality analysis.
5. Sufficient time exists for plant personnel to identify and terminate a boron dilution event prior to achieving a critical boron concentration in the DSC. To demonstrate that it can safely identify and terminate a boron dilution event, the licensee must provide the following:
 - a. A plant-specific criticality analysis to identify the critical boron concentration in the cask based on the highest reactivity loading pattern.
 - b. A plant-specific boron dilution analysis to identify all potential dilution pathways, their flowrates, and the time necessary to reach a critical boron concentration.
 - c. A description of all alarms and indications available to promptly alert operators of a boron dilution event.
 - d. A description of plant controls that will be implemented to minimize the potential for a boron dilution event.

- e. A summary of operator training and procedures that will be used to ensure that operators can quickly identify and terminate a boron dilution event.

3.2 Technical Evaluation

In determining the acceptability of the licensee's exemption request, the staff reviewed three aspects of the licensee's analyses: (1) criticality analyses submitted to support the ISFSI license application and its exemption request, (2) boron dilution analysis, and (3) legal basis for approving the exemption. For each of the aspects, the staff evaluated whether the licensee's analyses and methodologies provide reasonable assurance that adequate safety margins are developed and can be maintained in the MP2 SFP during loading of spent fuel into canisters for dry cask storage.

3.2.1 Criticality Analyses

For evaluation of the acceptability of the licensee's exemption request, the staff reviewed the criticality analyses provided by the licensee in support of its ISFSI license application. Appendix M, Chapter 6, "Criticality Evaluation," of the Standardized NUHOMS Final Safety Analysis Report (FSAR) contains detailed information regarding the methodology, assumptions, and controls used in the criticality analysis for the DSCs to be used at MP2. The staff reviewed the information contained in Chapter 6 as well as information provided by the licensee in its exemption request to determine if Criteria 1 through 4 of Section 3.1 were satisfied.

First, the staff reviewed the methodology and assumptions used by the licensee in its criticality analysis to determine if Criterion 1 was satisfied. The licensee provided a detailed list of the assumptions used in the criticality analysis in Appendix M, Chapter 6 of the NUHOMS FSAR as well as in its exemption request. The licensee stated that it took no credit in the criticality analyses for burnup or fuel-related burnable absorbers. The licensee also stated that all assemblies were analyzed at the highest permissible enrichment.

Additionally, the licensee stated that all criticality analyses for a flooded DSC were performed at temperatures and densities of water corresponding to optimum moderation conditions. In its supplemental response, dated January 25, 2005, the licensee provided the results of additional analyses it performed to determine the optimum moderation (i.e. maximum k_{eff}) conditions in the DSC. The licensee, using previously approved methodologies, determined the optimum moderation condition occurred at 75 percent of full-water density in the DSC. The licensee determined that this condition would only occur during a boiling condition in the cask that resulted in significant voiding. The maximum design basis temperature for the MP2 SFP is 150 degrees Fahrenheit. Therefore, the cooling system in the SFP is designed to preclude reaching the conditions calculated in the optimum moderation analysis. This provides additional conservative margin in the criticality analysis.

Finally, the licensee stated that it credited 90 percent of the Boron-10 content for the fixed neutron absorber in the DSC. NUREG-1536, "Standard Review Plan for Dry Cask Storage System," states that "[f]or a greater credit allowance [i.e. greater than 75 percent for fixed neutron absorbers] special, comprehensive fabrication tests capable of verifying the presence and uniformity of the neutron absorber are needed." In its review of the Standardized NUHOMS cask design, the staff reviewed and accepted the results of additional data supplied by the manufacturer which demonstrated that a 90-percent credit for the fixed neutron absorbers was acceptable in the TN NUHOMS®-32PT design. Therefore, for the purposes of this exemption, the staff finds a 90-percent credit acceptable on the basis that it has previously been reviewed and approved by the NRC. Subsequently, based on its review of the criticality analyses contained in Appendix M, Chapter 6 of the NUHOMS FSAR and the information submitted in its exemption request, the staff finds that the licensee has satisfied Criterion 1.

Second, the staff reviewed the proposed MP2 ISFSI TSs. The licensee's criticality analyses credit soluble boron for reactivity control during DSC loading, unloading, and handling

operations. Since the boron concentration is a key safety component necessary for ensuring subcritical conditions in the pool, the licensee must have a conservative TS capable of ensuring that sufficient soluble boron is present to perform its safety function. The most limiting loading configuration of a DSC requires 2500 parts-per-million (ppm) of soluble boron to ensure the k_{eff} is maintained below 0.95, the regulatory limit relied upon by the staff for demonstrating compliance with the requirements of 10 CFR 72.124(a). MP2's ISFSI TSs require the soluble boron concentration in the DSC cavity to be greater than or equal to the concentrations assumed in the criticality analyses under a variety of DSC loading configurations. In all cases, the boron concentration required by the ISFSI TS ensures that the k_{eff} will be below 0.95 for the analyzed loading configuration. Additionally, the licensee's ISFSI TSs contain surveillance requirements which ensure it will verify that the boron concentration is above the required level both prior to and during DSC loading, unloading, and handling operations. Based on its review of the MP2 ISFSI TSs, the staff finds that the licensee has satisfied Criterion 2.

Third, the staff reviewed the MP2 Updated Final Safety Analysis Report (UFSAR) and the information provided by the licensee in its exemption request to ensure that it complies with GDC-63. GDC-63 requires that licensees have radiation monitors in fuel storage and associated handling areas to detect conditions that may result in a loss of residual heat removal capability and excessive radiation levels and initiate appropriate safety actions. As a condition of receiving and maintaining an operating license, the licensee must comply with GDC-63. The staff reviewed the MP2 UFSAR and exemption request to determine whether it had provided sufficient information to demonstrate continued compliance with GDC-63. Based on its review of both documents, the staff finds that the licensee complies with GDC-63 and has satisfied Criterion 3.

Finally, as part of the criticality analysis review, the staff evaluated the storage of non-fuel related material in a DSC. The staff evaluated the potential to increase the reactivity of a

DSC by loading it with materials other than spent nuclear fuel and fuel debris. The approved contents for storage in the NUHOMS®-32PT cask design are listed in the Standardized NUHOMS Certificate of Compliance (CoC) 1004 Amendment 5 TSs. The contents have been reviewed for storage in the DSCs to be used at MP2 to ensure that subcritical conditions can be maintained. As such, MP2 is restricted to the storage of only those approved contents listed in the TSs. Additionally, the TSs restrict the loading patterns for storage of the approved contents. All of these controls ensure that the DSCs will remain subcritical under the most adverse conditions. Therefore, the staff determined that the loading limitations described in the CoC will ensure that any authorized components loaded in the DSCs will not result in a reactivity increase. Based on its review of the loading restrictions, the staff finds that the licensee has satisfied Criterion 4.

3.2.2 Boron Dilution Analysis

Since the licensee's ISFSI application relies on soluble boron to maintain subcritical conditions within the DSCs during loading, unloading and handling operations, the staff reviewed the licensee's boron dilution analysis to determine whether appropriate controls, alarms, and procedures were available to identify and terminate a boron dilution accident prior to reaching a critical boron concentration.

By letter dated October 25, 1996, the staff issued a safety evaluation (SE) of licensing topical report WCAP-14416, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology." This SE specified that the following issues be evaluated for applications involving soluble boron credit: the events that could cause boron dilution, the time available to detect and mitigate each dilution event, the potential for incomplete boron mixing, and the adequacy of the boron concentration surveillance interval.

The TS requirements for the NUHOMS®-32PT Cask System include a minimum boron concentration requirement of 2500 ppm boron when spent fuel assemblies with enrichments

less than or equal to 3.8 weight-percent (wt-percent) U-235 are loaded into an DSC canister. For higher enrichments, a combination of poison rod assemblies (PRAs) and SFP soluble boron concentration are used to ensure subcritical conditions are maintained in the DSC. The quantity of PRAs needed is a function of the initial, unirradiated enrichment of the fuel assemblies to be loaded in the DSC. For the purposes of this exemption review, the limiting critical boron concentration was determined for the 3.8 wt-percent enrichment loading with no PRAs. Therefore, the approval of this exemption is limited to the DSC loading, unloading, and handling of combustion engineering 14 x 14 fuel assemblies enriched to a maximum of 3.8 wt-percent U-235 and no PRAs. The NUHOMS soluble boron TS requirements ensure that k_{eff} is maintained less than 0.95. TS surveillance requirements require the boron concentration in the DSC water to be verified by two independent measurements within 4 hours prior to commencing any loading or unloading of fuel and verified every 48 hours thereafter while the DSC is in the SFP when one or more fuel assemblies are installed.

The licensee contracted with TN to perform a criticality analysis to determine the soluble boron concentration that results in a k_{eff} equal to 1.0 for 3.8 wt-percent U-235 fuel enrichments using the same methodology as approved in the Standardized NUHOMS Cask System Final Safety Analysis. The analysis determined the critical boron concentration level for 3.9 wt-percent U-235 enriched fuel was 1700 ppm. The licensee selected 3.9 wt-percent U-235 enriched fuel as opposed to the 3.8 wt-percent limit in the TSs for added conservatism. The boron concentration within the canister would have to decrease from the TS limit to the critical boron concentration before criticality is possible. The licensee based its boron dilution analyses and its preventive and mitigative actions on dilution sources with the potential to reduce the boron concentration from the TS minimum value to the critical concentration.

During the current analysis, the licensee referenced a previous analysis of the boron dilution event performed for MP2 and submitted to the NRC via letter on November 5, 2001. In

this analysis the licensee identified all credible potential sources that could dilute the SFP to critical conditions. The licensee determined that the limiting boron dilution event occurs when primary make-up water (PMW), with a maximum flow rate of 200 gpm (gallons per minute), is added to the SFP. The licensee identified the following additional credible bounding dilution sources and their flow rates: 100 gpm from the auxiliary feedwater makeup to the SFP through an open valve directly to the SFP; 142 gpm from the reactor building closed component cooling water leaking to the SFP through a heat exchanger tube rupture; 93 gpm from a piping leak in the fire protection system, domestic water or the turbine building closed cooling water system. The staff found the scope and results of the dilution source evaluation acceptable.

The licensee's calculations show that at least 5 hours will be available before the DSC water boron concentration decreases from 2500 ppm to the critical concentration of 1700 ppm when a slug flow (no mixing) model is assumed.

To demonstrate that sufficient time exists for plant personnel to identify and terminate a boron dilution event, the licensee provided a description of all alarms available to alert operators, and plant controls that will be implemented. There is no automatic level control system for the SFP; therefore, the SFP will overflow on an uncontrolled water addition. However, a high-level alarm in the control room would alert personnel of a potential boron dilution event within an hour for a 200 gpm dilution rate. Since it would take an additional hour before the pool begin to overflow, at least 3 hours would be available for mitigation of the dilution. The staff finds that this is sufficient time to terminate the event before 1700 ppm in the DSC is reached.

The configuration of the cask laydown pit in the pool could allow localized boron dilution and stratification because the pit is open to the SFP only through a narrow transfer path above

the level of stored fuel. Addition of cold water directly to the cask loading area that is denser than the warm, borated pool water could fill the bottom of the cask pit with water having a low boron concentration. To avoid direct dilution to the cask pit area, the licensee has committed to include several requirements to its ISFSI operational procedures whenever a DSC is in the SFP with fuel inside. The procedures will require (1) verification that the opening of the cask pit is free from obstructions so that adequate flow between the SFP and the cask pit is established, (2) verification that the return isolation valve to the cask laydown pit is open, which will ensure adequate mixing and cooling within the cask pit area, thereby minimizing the possibility that boron stratification occurs, (3) continuous personnel presence on the SFP floor to promptly identify any inadvertent dilution that could cause stratification in the cask pit, and (4) maintaining 850 gpm of SFP cooling flow to establish adequate mixing throughout the pool.

To ensure that operators are capable of identifying and terminating a boron dilution event during DSC loading, unloading, and handling operations, operator training will be conducted. The training will emphasize the importance of avoiding any inadvertent additions of unborated water to the SFP, responses to be taken for notifications or alarms that may be indicative of a potential boron dilution event during DSC loading and fuel movement, and identification of the potential for a boron dilution during decontamination activities.

Based on the staff's review of the licensee's exemption request dated November 5, 2004, the supplemental information provided by letters dated January 6, and January 25, 2005, and its boron dilution analysis, the staff finds the licensee has provided sufficient information to demonstrate that an undetected and uncorrected dilution from the TS required boron concentration to the calculated critical boron concentration is not credible. Based on its review

of the boron analysis and enhancements to the operating procedures and operator training program, the staff finds the licensee has satisfied Criterion 5.

Therefore, in conjunction with the conservative assumptions used to establish the TS required boron concentration and critical boron concentration, the boron dilution evaluation demonstrates that the underlying intent of 10 CFR 50.68(b)(1) is satisfied.

3.3 Legal Basis for the Exemption

Pursuant to 10 CFR 50.12, "Specific Exemption," the staff reviewed the licensee's exemption request to determine if the legal basis for granting an exemption had been satisfied, and concluded that the licensee has satisfied the requirements of 10 CFR 50.12. With regard to the six special circumstances listed in 10 CFR 50.12(a)(2), the staff finds that the licensee's exemption request satisfies 50.12(a)(2)(ii), "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." Specifically, the staff concludes that since the licensee has satisfied the five criteria in Section 3.1 of this exemption, the application of the rule is not necessary to achieve its underlying purpose in this case.

3.4 Summary

The following limitations and/or conditions are applicable to this exemption:

- A. Loading, unloading, and handling of the DSC for the TN NUHOMS®-32PT shall only be done at MP2.
- B. Loading, unloading, and handling in the DSC at MP2 is limited to combustion engineering 14 x 14 fuel assemblies that had a maximum initial, unirradiated U-235 enrichment of 3.8 wt-percent.
- C. The licensee will implement the actions as stated in Attachment 2 of its supplement dated January 25, 2005, namely:
 - 1. DNC will revise ISFSI procedures or calculations to state that poison rod assembly (PRA) use is not authorized by the proposed 10 CFR 50.68(b)(1) exemption.
 - 2. DNC will revise ISFSI procedures to require that when a fueled 32PT DSC is in the MPS2 [Millstone Power Station, Unit No. 2] SFP[,] Spent Fuel Pool Cooling Flow must be at least 850 gpm.
 - 3. During the time that a fueled DSC is in the SFP procedural controls will be implemented to ensure that the transfer canal bulkhead gate will not be used to block the transfer canal opening to the SFP.
 - 4. An additional precaution will be added to the SFP high level alarm response procedure to identify that if there is a fueled DSC in the SFP additional boron concentration limits apply. These limits will be specified in the procedure.
 - 5. Training will be conducted to ensure operators are aware of the 32PT DSC TS SFP boron concentration requirements, and should a boron dilution occur, at what boron concentration criticality in the DSC could occur. The training will emphasize the importance of avoiding any inadvertent additions of unborated water to the SFP, responses to be taken for notification or alarms that may be indicative of a potential boron dilution event during cask loading and fuel movement in the SFP, and identification of the potential for a boron dilution event during decontamination rinsing activities.

6. Appropriate controls or measures to minimize the possibility of direct dilution of the cask handling area of the SFP will be established prior to DSC loading.
 - a) DNC will revise ISFSI procedures to require an individual remain on the SFP floor at all times when a fueled 32PT DSC is in the MPS2 SFP to ensure that the SFP is not overflowing and that water is not unintentionally spilling into the SFP.
 - b) DNC will revise ISFSI procedures to require Valve 2-RW-350 [to] remain open when a fueled 32PT DSC is in the MPS2 SFP.
 - c) DSC procedures will be modified to include a requirement that the SFP will be sampled for boron concentration after each intentional addition of a maximum of 500 gallons of unborated water.
7. DNC will revise ISFSI procedures to require [that] Valve 2-RW-2 will be closed when a fueled 32PT DSC is in the MP2 SFP.

The staff finds, based upon the review of the licensee's proposal to credit soluble boron during DSC loading, unloading, and handling in the MP2 SFP, that pursuant to 10 CFR 50.12(a)(2), the licensee's exemption request is acceptable.

4.0 CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants Dominion Nuclear Connecticut, Inc. an exemption from the requirements of 10 CFR 50.68(b)(1) for the loading, unloading, and handling of the components of the TN NUHOMS®-32PT dry cask storage system at MP2. Any changes to the cask system design features affecting criticality or its supporting criticality analyses will invalidate this exemption.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (69 FR 2012).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 15th day of February 2005.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Ledyard B. Marsh, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation