

UNITED STATES OF AMERICA  
 NUCLEAR REGULATORY COMMISSION  
**DOCKETED 08/08/02**  
 ATOMIC SAFETY AND LICENSING BOARD  
**SERVED 08/08/02**

Before Administrative Judges:

Charles Bechhoefer, Chairman  
 Dr. Richard F. Cole  
 Dr. Charles N. Kelber

In the Matter of  DOMINION NUCLEAR CONNECTICUT, INC.  (Millstone Nuclear Power Station, Unit No. 3; Facility Operating License NPF-49)
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Docket No. 50-423-LA-3  
 ASLBP No. 00-771-01-LA-R  
 August 8, 2002

MEMORANDUM AND ORDER  
(Denying Request for Evidentiary Hearing on Reopened Contention 4,  
 and Terminating Proceeding)

Appearances:

David A. Repka, Esq., Donald F. Ferraro, Esq., Charles Thebaud, Esq., Washington, D.C., and Lillian M. Cuoco, Esq., Berlin, Connecticut, for Dominion Nuclear Connecticut, Inc. (DNC), Licensee

Nancy Burton, Esq., Redding Ridge, Connecticut, for the Connecticut Coalition Against Millstone and the Long Island Coalition Against Millstone (CCAM/CAM), Intervenors

Ann P. Hodgdon, Esq. and Sara Brock, Esq., for the Nuclear Regulatory Commission Staff

This proceeding concerns the application by Dominion Nuclear Connecticut, Inc. (DNC or Licensee) to expand the capacity (through the use of additional high-density storage racks) of the spent fuel pool (SFP) at the Millstone Nuclear Power Station, Unit No. 3 (Millstone-3), a pressurized water reactor located near New London, Connecticut. In response to the request of the Licensee, the proceeding is subject to the hybrid hearing procedures of 10 C.F.R. Part 2, Subpart K (10 C.F.R. §§ 2.1101-2.1117).

Based upon our review of the written presentations of each of the parties, and following an oral argument conducted in Mystic, Connecticut, on April 2, 2002 (Tr. 698-859), the Atomic Safety and Licensing Board, for the reasons set forth below, hereby

concludes that there are no significant factual disputes that would warrant a further evidentiary hearing concerning the lack of accountability of certain missing spent fuel rods; that, although disputed issues of fact do exist concerning the reporting of the missing fuel rods to both NRC and this Board, these are not the type of factual disputes that would warrant a hearing here (but, rather, are the subject of an ongoing enforcement proceeding); that the amended license authorizing the SFP expansion at Millstone-3 should remain in effect; and that this proceeding should be terminated.

A. Procedural Background.

On October 26, 2000, this Licensing Board, following an oral argument conducted on July 19-20, 2000, issued a Memorandum and Order that (1) adopted a license condition sought by Connecticut Citizens Against Millstone and Long Island Citizens Against Millstone (CCAM/CAM or Intervenors) (former Contention 5, concerning required concentrations of boron in the SFP); (2) denied CCAM/CAM's request for a full evidentiary hearing on other issues or contentions (including Contention 4); and (3) terminated the proceeding. Northeast Nuclear Energy Co. (Millstone Nuclear Power Station, Unit 3), LBP-00-26, 52 NRC 181 (2000).<sup>1</sup> CCAM/CAM appealed that Memorandum and Order. During the pendency of that appeal, it was reported to the NRC Staff by Northeast Nuclear Energy Co. (NNECO) (the then-licensee) that two fuel rods from Millstone Nuclear Power Plant, Unit No. 1 (Millstone-1), a reactor also operated by NNECO and then being decommissioned, could not be accounted for.

CCAM/CAM thereafter filed a motion to reopen the record and to vacate our decision on CCAM/CAM Contention 4.<sup>2</sup> By such motion, CCAM/CAM sought to incorporate the issue of the missing fuel rods into our decision on CCAM/CAM

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<sup>1</sup>Effective March 31, 2001, the ownership of Millstone-3 was transferred from Northeast Nuclear Energy Co. (NNECO) to Dominion Nuclear Connecticut, Inc. (DNC), the current operating licensee.

<sup>2</sup>[CCAM/CAM] Motion to Reopen and to Vacate Decision, dated December 18, 2000.

Contention 4, which concerned whether or not the Licensee has the ability or willingness to carry out properly a program for the safe placement of fuel bundles (groups of fuel rods) in the SFP. By Memorandum and Order (Denying Motion to Reopen Record on Contention 4), LBP-01-01, 53 NRC 75 (2001), the Licensing Board initially denied the motion to reopen on the ground that the newly discovered information, as presented, would not likely have changed the result reached in LBP-00-26. (In particular, CCAM/CAM had failed to spell out the relationship of the new information concerning the Millstone-1 fuel rods to any of their previously admitted contentions.)

CCAM/CAM thereafter filed a motion for reconsideration of LBP-01-01.<sup>3</sup> On May 10, 2001, the Licensing Board granted CCAM/CAM's motion and reopened the record with respect to CCAM/CAM Contention 4. LBP-01-17, 53 NRC 398 (2001). We defined the reopened issue as the extent to which the lack of accountability of the missing fuel rods at Millstone-1 bears upon both the adequacy of administrative controls at the Millstone-3 SFP and DNC's ability or willingness to implement such controls successfully. The scope of reconsideration was limited to the procedures or controls for management of the two SFPs and their modes of execution that may be common to Millstone-1 and Millstone-3. *Id.* at 408.

B. Technical Issues Presented.

1. Presentations by the Parties. In support of its position on reopened Contention 4, and in accord with the requirements of 10 C.F.R. § 2.1113(a), DNC offered a written summary, together with the sworn testimony and exhibits of Hugh McKenney, a nuclear engineer serving as a supervisor responsible for the reactor engineering team at Millstone-3, Affidavit dated March 14, 2002 (McKenney Aff.); Daniel J. Meekhoff, Supervisor, Nuclear Operations Support for Millstone-3, Affidavit dated March, 2002 (Meekhoff Aff.); a DNC outside expert panel consisting of Robert V.

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<sup>3</sup>[CCAM/CAM] Motion for Reconsideration, dated January 29, 2001.

Fairbank, Jr., Richard N. Swanson, and Hugh L. Thompson, Jr., Affidavits dated March 14, 7, and 14, 2002, respectively (DNC Panel Aff.); and Joseph J. Parillo, a DNC nuclear engineer serving as a Senior Engineer in the Reactor Analysis Section at Millstone, Affidavit dated March 13, 2002 (Parillo Aff.).<sup>4</sup> Further, DNC's witnesses relied in part on (1) a report of an investigation undertaken by NNECO concerning the loss of the two fuel rods ([Millstone-1] Fuel Rod Accountability Project (FRAP Report)), approved by NNECO on October 1, 2001 (DNC Exh. 4); and (2) a Root Cause analysis (RCA) of the FRAP Report, approved by NNECO on October 25, 2001 (DNC Exh. 5).

CCAM/CAM for its part presented written testimony which was supported by the declaration dated March 18, 2002 of Joseph H. Besade, a member of CCAM who also serves as its Secretary and formerly worked at the Millstone Power Station (Tr. 821) (Besade Decl.).<sup>5</sup> Included with Mr. Besade's declaration was (1) NRC Inspection Report 05000245/2001013, dated February 26, 2002 (CCAM/CAM Exh. 1, transmitted by NRC to DNC by letter dated February 27, 2002); (2) a report by NRC's Office of Investigations, Case No. 1-2001-007, "Failure to Report Missing or Lost Radioactive Fuel Rods in a Timely Manner," dated September 28, 2001 (OI Report) (CCAM/CAM Exh. 2, previously transmitted to the Board and parties by the NRC Staff on October 31, 2001); (3) a copy of a newspaper article authored by Andrew Quinn titled "Data Show World Awash in Stolen Nuclear Material," Reuters News Service, March 6, 2002 (CCAM/CAM Exh. 3); and (4) a copy of DNC Licensee Event Report (LER) 2001-007-00, "Movement of Heavy Loads not Addressed in Procedure," dated December 17, 2001 (CCAM/CAM Exh. 4).

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<sup>4</sup>Summary of Facts, Data, and Arguments on which [DNC] Will Rely at the Reopened Proceeding Subpart K Oral Argument, dated March 18, 2002.

<sup>5</sup>[CCAM/CAM] Detailed Written Summary Pursuant to 10 C.F.R. Section 2.1113, dated March 18, 2002.

The NRC Staff also presented written testimony, relying on affidavits and exhibits.<sup>6</sup> The Staff offered the affidavits of Ronald R. Bellamy, Chief of the Decommissioning and Laboratory Branch, Division of Nuclear Materials Safety and Safeguards, NRC Region I, dated March 18, 2002 (Bellamy Aff.); Antone C. Cerne, Senior Resident Inspector (SRI) at Millstone-3, dated March 18, 2002 (Cerne Aff.), Anthony C. Attard, a Physicist/Engineer in the Reactor Systems Branch, NRC Office of Nuclear Reactor Regulation (NRR), dated March 19, 2002 (Attard Aff.); and Anthony P. Ulses, Nuclear Engineer, Safety Margins and Systems Assessment Branch, NRC Office of Research, dated March 18, 2002 (Ulses Aff.).

2. Location of fuel assemblies in SFP. In its initial form, as accepted by the Board, Contention 4 challenged the safety of the expanded SFP for allegedly trading reliance on physical separation of fuel assemblies (in the non-expanded SFP) for administrative controls “to an extent that poses an undue and unnecessary risk of a criticality accident.” LBP-00-02, 51 NRC 25, 34 (2000). This was said to be so in particular because of the then-licensee’s past history of not being able (or willing) to abide by administrative controls with respect, *inter alia*, to spent fuel configuration. *Id.* In rejecting this claim in LBP-00-26, we acknowledged CCAM/CAM’s demonstration that fuel misplacements can, and indeed do, occur in SFPs, but found that “[s]afety margins [relative to a criticality event] are maintained by the regulatory requirement that rack reactivity be less than [a limit ( $K_{eff}$ ) of] 0.95,” LBP-00-26, 52 NRC at 200, and that, with respect to the numerous incidents of misplacements cited by CCAM/CAM, the 0.95 limit had not been breached. *Id.* at 197, 200.

The reopened Contention 4 reflects the Licensee’s discovery in 2000 of its inability to account for two fuel rods at Millstone-1 (then in the process of being

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<sup>6</sup>NRC Staff Brief and Summary of Relevant Facts, Data and Arguments Upon Which the Staff Proposes to Rely at Oral Argument on Contention 4 in the Reopened Proceeding, dated March 18, 2002.

decommissioned) and its report of this circumstance to the NRC Staff following the date of our issuance of LBP-00-26. This proceeding was then reopened to explore whether there is any commonality between procedures involved in the Unit 1 event and the Unit 3 procedures supporting the revised Unit 3 SFP storage configuration, including reactivity limits authorized by the license amendment granting expansion of the SFP storage capacity.

3. Description of event circumstances. A brief description of the background of the missing fuel rods has been presented by DNC and is summarized here for clarity. See DNC Panel Aff., ¶¶ 15-16, 19, 22, 30-32. In September 1972, Millstone-1 condenser tubes failed and seawater leaked into the reactor coolant system. In October 1972, in order to evaluate the effects of the seawater on fuel, GE personnel disassembled fuel assembly MS-557 and stored all of its 49 fuel rods in seven specifically designed 8-rod containers. In April 1974, GE personnel reassembled MS-557 but did not include one of the eight tie rods (because it had been slightly damaged during handling) or the center spacer capture rod (which could not be reinstalled because of its unique physical characteristics). Neither GE records nor Unit 1 Reactor Engineering records mentioned the two rods at the time of the reassembly of MS-557 in April 1974.

In May 1979, the Unit 1 Reactor Engineer (RE) asked GE personnel to read the serial numbers of two fuel rods in an 8-rod container in the Unit 1 SFP. Using the information obtained, the RE and GE personnel concluded that the rods were the two rods previously removed from MS-557. The RE created a data card for the two rods in May 1979, and SFP maps dated February and April 1980 show the two fuel rods from MS-557 in the Northwest Corner of the SFP. A September 1980 SFP map does not, however, display the two MS-557 fuel rods. In late 1980, the Unit 1 RE who, with GE personnel, had identified the two rods in May 1979 left Millstone and another engineer assumed the RE's responsibilities. The two REs did not recall having discussed the two

rods during their turnover. No one interviewed had a clear recollection of actually seeing the two MS-557 fuel rods in the SFP after this turnover in late 1980.

As a hypothetical explanation of the fuel rods' disappearance, NNECO theorized that, because material other than fuel rods are present in a SFP, the rods in question may have been removed from the SFP in the belief that they were in fact those other materials, some of which resemble fuel rods when viewed under water, as is the case with the Local Power Range Monitors (LPRMs) discussed below.

To reduce radiation levels to which plant personnel are exposed, SFPs throughout the industry are used to store a variety of irradiated components in addition to spent fuel. Examples include inspection equipment, refueling tools, and irradiated hardware to be processed and shipped as radiological waste. The Millstone-1 SFP accumulated substantial irradiated hardware over time, requiring a number of clean-up campaigns beginning in the late 1970s and continuing through the 1990s.

LPRMs--reactor core instruments that require replacement as they are expended during plant operation--comprised a substantial portion of the irradiated hardware inventory in the Unit 1 SFP, particularly through the mid-1980s. They are approximately 43 feet in length and consist of a "hot" section and a "cold" section. The "hot" section consists of that portion located within the active region of the core and incorporating detectors (i.e., fission chambers containing small amounts of special nuclear material (SNM)).

The "cold" section is that portion outside the active region of the core. Disposal of LPRMs requires separation of the "hot" and "cold" segments, with the hot ends then cut into segments to fit into shielded casks for shipment to licensed Low Level Radioactive Waste facilities. To minimize radiation doses to workers, the LPRM cutting operations are performed several feet under water using remote tools.

When separated from the associated "cold" section, LPRM "hot" sections were between 12 and 13 ½ feet in length and about 0.7 inches in diameter. The two Unit 1

fuel rods from MS-557 were about 13 feet 2 inches long and about ½ inch in diameter. Radiation levels of the fuel rods and LPRM “hot” sections are both very high and could be mistaken for each other when subjected to radiation monitoring. Moreover, given their similar dimensions, the Unit 1 fuel rods and LPRM “hot” sections are difficult to tell apart visually when being handled under several feet of water.

In September and October 1979, contract workers with limited experience in identifying reactor components were hired to cut numerous LPRMs that were stored in the Unit 1 SFP. They did not use visual aids such as borescopes or periscopes to enhance component identification underwater. Nor were they advised to expect to find individual fuel rods stored outside the fuel racks in close proximity to irradiated LPRMs. Their training, experience, equipment, supervision, and task assignment did not equip them to distinguish an LPRM “hot” section from a fuel rod several feet under water. Although the FRAP report did not find conclusive evidence that fuel rods were mistaken for LPRM “hot” sections, it concluded that the Unit 1 rods could have been inadvertently cut in 1979, as if they had been LPRMs.<sup>7</sup>

The analysis in the FRAP report (upon which DNC witnesses have relied, as noted above) was reviewed, and its adequacy confirmed, by the NRC Staff. As set forth by Ronald R. Bellamy, a branch chief from NRC Region I, and the manager responsible for NRC’s special inspection conducted onsite to review the thoroughness and completeness of the NNECO FRAP investigation and the RCA, the NNECO investigation was “thorough and complete, and the conclusions were reasonable and supportable.” Bellamy Aff., ¶ 5.

4. Administrative Controls at Millstone Units 1 and 3. The record reflects that the controls used in the Unit 3 SFP are clearly more complex and sophisticated than

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<sup>7</sup>If this is, indeed, what happened, the fuel rods could have been included in the shipments to Barnwell in May 1988 as part of the effort to clean up the Unit 1 SFP, including the LPRMs, in advance of the 1989 re-racking. See DNC Panel Aff., ¶ 19.

those previously used in the Unit 1 SFP. McKenney Aff., ¶¶ 9-11; Bellamy Aff., ¶ 7. For example, the Millstone-1 procedures had no expectation that fuel assemblies would ever be disassembled, so the SNM procedures at the time did not call for specific accountability over individual fuel rods. In contrast, at Millstone-3 the procedures have always called for individual fuel rods that have been permanently removed from their assembly to be tracked as an item of SNM. Further, at the Millstone-1 SFP there never was a clearly defined inventory of record serving as the basis for periodic surveys, whereas at the Millstone-3 SFP there has been an inventory of record. See McKenney Aff., ¶¶ 30, 49. We find no evidence to indicate that the Millstone-3 procedures are insufficient to serve their intended purpose. Indeed, insofar as we are aware, they were used successfully at Millstone-3 during refueling outage (“RFO”) 7 in early 2001 (id., ¶¶ 12-15).

The central issue raised by CCAM/CAM's reopened Contention 4 is the reliability of human efforts in adhering to administrative controls. The loss or misplacement of fuel rods at Millstone Unit 1 reflects the potential for human error. When the administrative controls have no provision for independent checks or redundancy, a single error can, as the FRAP and RCA reports show, propagate over long periods of time. It is important, therefore, to note that the controls on fuel inventory at Millstone-3 provide for a redundant set of inventory data through a computer generated record which echos the information maintained on index cards (the Kardex file) (id. at ¶¶ 20-22; Cerne Aff., ¶¶ 7, 10). Thus, the loss of information that occurred at Unit 1 is less likely to occur at Unit 3 because of the need to reconcile the computer generated and “Kardex” data files. To be sure, the computer record is itself generated by human input and it is certainly conceivable that the same error could be entered in both records. That is, both records could be reconciled and both be wrong.

The main provision against such error, and the central reason for our assessment of the adequacy of current procedures, is the required independent

verification of SFP fuel movements. That verification begins with the requirement that independent observers ascertain the serial number identifying each fuel assembly when it is ready to be moved. This serial number is assigned according to the standard ANSI/ANS-57.8-1978, "Fuel Assembly Identification" (McKenney Aff., ¶57).

Independent observers verify the serial number and, subsequently, the placement, of the fuel assembly being moved (id., ¶41). This procedure has been satisfactorily implemented at Millstone-3, according to the NRC Senior Resident Inspector:

I inspected and supervised other NRC inspectors in the review and observation of Millstone Unit 3 refueling activities during the refueling outage in May - June 1999, and again during the last refueling outage in February - March 2001. During licensee preparations for the latter refueling activities, I reviewed the licensee's administrative controls and witnessed the transfer of a number of new fuel assemblies from their dry storage locations to the new Region 1 fuel racks in the spent fuel pool (SFP). Even though any new fuel assembly could have been stored in any designated (3 out of 4) new fuel storage rack location without adverse impact upon criticality margins, I observed the use of the licensee's administrative controls, including double verification, to assure the proper placement of each new fuel assembly into the rack location where it was designated to be placed. Likewise during both aforementioned refueling outages, I witnessed the movement of fuel assemblies in the spent fuel pool, verifying the adequate use of administrative controls and the required double verification of fuel assembly placement into the designated SFP rack locations. For special nuclear material accountability, I verified that such fuel assembly transfers were documented, as procedurally prescribed, on a "Material Transfer Form." (Cerne Aff., ¶7.)

And,

[t]he entire body of administrative controls employed in the refueling operations that I have inspected contains both the procedural specificity and the redundancy necessary to preclude a single human error from presenting a challenge to nuclear safety at Millstone Unit 3. The administrative controls at Millstone Unit 3 also possess sufficient rigor and defense in depth that, when implemented by trained and properly supervised workers, criticality in the spent fuel pool will be precluded. (Id., ¶14.)

The independent verification procedure involves two observers viewing the same monitor, the second observer having to either concur or not with the first (Tr. 787). The Board inquired whether an automated inventory control, such as the uniform bar code system commonly employed in the distribution of retail goods, could be used to

supplement human observation. The answer is that bar codes are used in the manufacture of individual fuel pins, but that these codes get obscured by corrosion and crud deposition during operation (McKenney Aff., ¶ 55). The intense radiation environment might make use of a radio-frequency tag infeasible, though such tags are used in applications where some radiation is present.<sup>8</sup>

Further, the Board inquired whether the independent verification procedure should include at least one third-party independent observer (Tr. 790). In that connection, the Board noted that the procedure followed by DNC during RFO-7 (which the Staff found to be satisfactory, see Cerne Aff., ¶¶ 7, 13) was subject to verification by a Staff inspector. Neither DNC nor the Staff found such independent verification requirement to be necessary or useful. Tr. 791, 809.

As part of their written presentation, as well as at oral argument (Tr. 739-42), CCAM/CAM relied on a Licensee Event Report (LER) (designated number 2001-007-00)<sup>9</sup> filed by NNECO (with respect to Millstone Unit 2) in December, 2001, and reporting a development discovered in October, 2001, as demonstrating NNECO's inability or unwillingness to abide by applicable programmatic procedures. The LER states, in pertinent part, that

(ABSTRACT) It has been identified that no safe load path exists for lifts of new fuel shipping containers . . . in the area of the cask washdown pit and the associated lifting device is not single failure proof. . . .

1. Event Description. [H]eavy loads have been historically moved at Millstone Unit No. 2 without appropriate procedural guidance . . . Historically this issue has been addressed via the guidance provided in NUREG-0612, "Control of heavy loads at Nuclear Power Plants. . . ."

The [Millstone-2] Spent Fuel Pool Area . . . is addressed by procedure MP 2712B1, "Control of Heavy Loads." The procedure shows the Spent Fuel Pool as a restricted area for lifts, with a safe load path adjacent to the pool.

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<sup>8</sup>See further discussion, infra, at Section B.6(c) of this Memorandum and Order.

<sup>9</sup>See CCAM/CAM Presentation, Exh. 4.

Historically, loads such as new fuel, spent resin casks, and other items have been lifted from the railroad access bay . . . over a safety related pipe trench. Most recently, a spare reactor coolant pump [P] motor [MO] was lifted into the cask washdown pit. However, these loads have been lifted over the safety related pipe trench using a crane [CRN] that is not “single failure proof” as described in NUREG-0612.”

## 2. Cause

The root cause for the failure to identify heavy load paths is inadequate engineering work practices in the Millstone engineering department in the area of programs (emphasis supplied).

During the oral presentation, DNC stated that the determination to file an LER reflected the discovery that the crane was not single-failure-proof, as required by the guidelines set forth in NUREG-0612. Those guidelines premised the single-failure-proof crane requirement on the likelihood of a cask drop into safety-sensitive areas, such as an SFP. NNECO had revised its earlier determination that the estimated frequency of a heavy load drop in the area under consideration was of the order of  $10^{-12}$  per reactor year (Tr. 773). A review of the NRC Guidance Document on the control of heavy loads, NUREG-0612, “Control of Heavy Loads at Power Plants,” shows that the guidance in that document was based on a probabilistic risk analysis performed by the Staff. At the time of the writing of the report (1980), suitable data were sparse—the Staff relied for the most part on data retrieved from the U.S. Navy.

CCAM/CAM has, in our view, pointed to an acknowledged failure of NNECO management to have abided by governing programmatic standards affecting cranes. But, at most, that failure of NNECO appears to represent a technical violation, commencing long before the plants’ shutdown and later restart in the period 1996-98. NNECO and later DNC management have, however, taken voluntary steps to identify and correct the technical error. Thus, given the guidance (rather than binding regulatory) status of NUREG-0612, it would not have been unreasonable for a licensee to rely on plant specific data for a plant specific determination. Data used in the analysis of heavy load drops are continually acquired and risk reassessments made.

The latest such appraisal is dated April 4, 2001 (ADAMS Accession number ML011010385.) This reassessment lowers the estimated frequency of load drops, perhaps to the point where a single-failure crane would not be required.

A revision of prescribed procedures by NNECO/DNC on the basis of a systematic review does not constitute support for the view espoused by CCAM/CAM that the licensee is chronically unable or unwilling to follow administrative controls, notwithstanding its failure to do so in that particular instance. On the contrary, it may be regarded as an example of good practice by current management, fully consistent with proper implementation of administrative controls.

In sum, the procedures used at Millstone-3, implemented in the fashion described by the Senior Resident Inspector, are sufficient to preclude, with high reliability, an accidental criticality in the SFP. A further evidentiary hearing is not necessary for us to reach this conclusion.

5. Reporting of Missing Millstone-1 Fuel Rods to NRC and this Board. One of the issues raised before the Board in this reopened proceeding was whether NNECO had reported the missing fuel rods to NRC, as well as to this Board, in a timely fashion and, if not, should the failure be regarded as an example why DNC may lack the ability or willingness to administer the SFP controls adequately. See CCAM/CAM Presentation at 5-7. According to the Licensee, the circumstance that two fuel rods from Millstone-1 were apparently missing was identified by NNECO through a visual inspection of the Millstone-1 SFP on or about September 12, 2000 (Meekhoff Aff., ¶ 17). After special inspections in mid-November, 2000 failed to locate the rods in likely SFP locations, the issue was documented in an internal Condition Report. NRC was advised by telephone on November 16, 2000, and a formal call to the NRC Operations Center was made on December 14, 2000. Id. NNECO filed its LER concerning the missing fuel rods on January 11, 2001. Id. NNECO advised the Licensing Board of the missing fuel rods by a letter dated January 16, 2001, forwarding to the Board and parties a copy of the LER

filed on January 11. Earlier, however, in December, 2000, the Board and parties had become aware of the allegedly missing fuel rods through CCAM/CAM's filing of its motion to reopen the record.

Formal requirements for licensees' reporting of information to the NRC appear at 10 C.F.R. § 20.2201 ("Reports of theft or loss of licensed material"). For material of the type represented by the missing fuel rods, telephone notification of the loss or misplacement or theft must be made "[i]mmediately after its occurrence becomes known to the licensee". 10 C.F.R. § 20.2201(a)(i) (emphasis supplied). Licensees required to make the above telephone notification must make a written report (LER) to NRC within 30 days. 10 C.F.R. § 20.2201(b).

In addition, with respect to Licensing Boards, it has long been expected that, irrespective of the formal regulatory reporting requirements to NRC (described above), all parties to an adjudicatory proceeding are expected to advise the adjudicator (here this Licensing Board) and all parties of "new information which is relevant and material to the matters being adjudicated." Duke Power Co. (William B. McGuire Nuclear Station, Units 1 & 2), ALAB-143, 6 AEC 623, 625 (1973); see also Tennessee Valley Authority (Browns Ferry Nuclear Plant, Units 1, 2 and 3), ALAB-677, 15 NRC 1387, 1394 (1982). Any uncertainty with regard to the relevancy and materiality of new information is to be decided by the adjudicator. McGuire, 6 AEC at 625 n.15.

To determine the adequacy of the reporting of the missing fuel rods, both to NRC (under Part 20 reporting requirements) and to this Board (pursuant to the McGuire requirements), we must determine when NNECO had, or should have had, adequate knowledge of the loss or potential loss of the fuel rods to have engendered either reporting requirement. If NNECO had such knowledge by September, 2000, a report to this Board prior to October 26, 2000 (the issuance date of LBP-00-26) should have been made. If such report had been tendered, it could very well have had an impact on the timing of our issuance of LBP-00-26.

DNC claims that NNECO had not yet determined in September, 2000 that the two fuel rods were actually missing; the most they knew was that there was a records discrepancy that had to be investigated. Assuming adequate knowledge by NNECO, however, and given the pendency of reopened Contention 4, it appears that, during September or October, 2000, the Board should at least have been alerted to the initiation of this investigation.

Currently, however, the record is insufficient for us to determine NNECO's degree of knowledge of the missing fuel rods. A further evidentiary hearing would likely be necessary for us to make a definitive determination on whether DNC should have advised the Board at an earlier date (in September or October, 2000) of the investigation as to the location of the fuel rods. But is this the type of dispute of fact that would warrant the evidentiary hearing contemplated under 10 C.F.R. § 2.1113? We think not. As set forth in the rule itself (10 C.F.R. § 2.1115), as well as in the Statement of Considerations for Subpart K (50 Fed. Reg. 41,662, 41,667 (Oct. 15, 1985)), there must not only be specific facts that are in genuine and substantial dispute but the decision of the Commission, including this Board, must likely be dependent on the resolution of the dispute. In our view, the factual difference that would warrant an evidentiary hearing would have to relate to the technical sufficiency of the license-amendment proposal.

CCAM/CAM claim that the reporting or notification failure bears directly on the Licensee's ability or willingness to implement satisfactorily the administrative controls attendant to the SFP expansion. The Board instead views the alleged failure to file with it a timely report as the result of mere confusion as to what had occurred and an uncertainty about the need to confirm doubts as to whether there was any outstanding information that would warrant a litigation-related report. The information is peripheral at best to the Licensee's ability or willingness to carry out SFP administrative controls

adequately. As such, it does not rise to the type of disputed fact that would cause us to authorize a full evidentiary hearing.

This is not to denigrate the importance of the alleged reporting delays by the Licensee to either this Board or the Staff. The delay in reporting to the Staff is currently the subject of a Notice of Violation and proposed enforcement remedies. See Notice of Violation and Proposed Imposition of Civil Penalty (NOV), EA No. 02-014, dated June 25, 2002.<sup>10</sup> Although the obligation to report to this Board is separate and distinct from the obligation to report to the Staff, litigation of the facts before us would appear to be essentially duplicative of the determination presently under review by the Staff. Thus, clarification of the facts in dispute, as described above, may preferably be carried out in that context, rather than here.<sup>11</sup> In our view, no separate penalty to be imposed by us would be warranted in the context of this case, particularly in view of the OI recommendation (CCAM/CAM Exh. 2) that the failure to report was not intentional. In the future, however, we would advise DNC in similar situations to report both to the Staff and to this Board.

6. Other Matters. During the course of the reopened proceeding, during telephone conference calls on May 24, 2001 and February 28, 2002, the Licensing Board posed several questions related to the proceeding. In their presentations, DNC and the Staff responded to these inquiries. These responses adequately dealt with the subject of the inquiries, as set forth below:

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<sup>10</sup>Given the ongoing civil penalty proceeding, we need not, and do not, discuss whether the alleged (DNC Panel Aff.) failure to advise the Licensing Board in a timely manner of the potentially missing fuel rods might constitute a material false statement by NNECO, within the meaning of § 186 of the Atomic Energy Act, 42 U.S.C. § 2236. Cf. Virginia Electric and Power Co. (North Anna Power Station, Units 1 and 2), LBP-75-54, 2 NRC 498, 532-34 (1975), aff'd on this issue, CLI-76-22, 4 NRC 480, 489-92 (1976).

<sup>11</sup>We are not aware of whether or not DNC has formally requested an enforcement hearing or, instead, has acceded to the remedies proposed by the Staff in its NOV.

(a). The Board requested a description of Millstone-1 and Millstone-3 Technical Specifications and regulations governing SFP inventory and corresponding plant implementing procedures. DNC advised that there are no Technical Specifications for either Unit that govern SFP inventory. Rather, the respective operating licenses are subject to the requirements of 10 C.F.R. Part 70, which requires licensees to establish procedures and records for SNM inventory controls. (DNC listed the key procedures for Millstone-3.) See McKenney Aff., ¶ 53.

(b). In response to a Board inquiry concerning computer-generated core and SFP inventories for Millstone-1 and Millstone-3, DNC reiterated its previously stated testimony to the effect that both units now use the Shuffleworks program. This program was adopted at the Millstone Station in the 1990s and did not exist at the time DNC asserts that accountability over the two Millstone-1 rods was lost. An illustrative Unit-1 SFP map was provided to the Board and parties as DNC Exh. 1; copies of illustrative maps for the Unit-3 core and SFP were provided as DNC Exhs. 2 and 3. See McKenney Aff., ¶ 54.

(c). In response to inquiries from the Board regarding industry practices in maintaining fuel inventory, and the possible utility of modern inventory control techniques such as uniform bar code markers, DNC explained why there was not any use in the nuclear industry of bar codes as a means to control SNM inventory. DNC described several types of identification numbers but explained why the use of any of them would likely be not feasible. See McKenney Aff., ¶¶ 52-58. From these responses, it appears that DNC is following standard industry practice in maintaining its inventory of fuel at Millstone-3.<sup>12</sup>

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<sup>12</sup>With respect to these practices, the Board encourages the NRC Staff to confer with industry representatives about possible use of Radio Frequency Tags as a means of fuel assembly identification, and whether such an automated inventory control system is technically and economically feasible. These tags (which have been developed by a number of organizations including DOE) offer the possibility of remote identification  
(continued...)

(d). In response to how corrective actions resulting from the Unit-1 issue were addressed for Units 2 and 3, DNC stated that it reviewed and adopted the RCA Report (DNC Exh. 5). According to DNC, the RCA Report was treated as “an important self-assessment DNC document” under the Millstone Corrective Action Program. The Staff indicated that none of the corrective measures are specifically directed at Millstone-3 but that, to the extent the overall corrective action plan provides an enhancement to the programmatic station controls, future Unit-3 activities could be affected. The Staff adds that, with respect to Millstone-3, such measures would be regarded as improvements and not as required corrective actions. See Cerne Aff., ¶ 12.

(e). In response to an inquiry regarding the applicability to Millstone-3 of Regulatory Issue Summary (RIS) 2001-12, “Nonconservatism in Pressurized Water Reactor Spent Fuel Storage Pool Reactor Equivalency Calculations,” dated May 18, 2001, and particularly the Oak Ridge National Laboratory (ORNL) report referenced therein, DNC advised that it had reviewed the ORNL report and evaluated it for applicability to Millstone-3, and documented such evaluation through the Millstone Corrective Action Program. DNC concluded that, of the two circumstances where the nonconservatisms mentioned in the report would be applicable, one (“geometric configurations”) did not apply to Millstone-3, whereas the other (“soluble boron credit”), although applicable at Millstone-3, does not change the soluble boron concentration previously found to govern at Millstone-3. See Parillo Aff., ¶¶ 4-10. The Staff indicated that any errors introduced into the final Region 3  $K_{\text{eff}}$  would be more than offset by

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<sup>12</sup>(...continued)

allowing fuel assembly identification with greater efficiency and accuracy and less worker exposure than the current practice. The survival of such tags in an intense radiation environment is an obvious problem that must first be resolved.

We note that automated inventory procedures are hardly error free, as any one who has been in a supermarket check-out line can attest. But, the point is that the errors are different from, and independent of, those that are made by humans.

various conservatisms in either the configuration analyzed or the actual plant configuration. See Ulses Aff. ¶ 5. The Board accepts these analyses.

C. Conclusion and Order.

1. We commend CCAM/CAM for its persistence in bringing to light the Licensee's demonstrated lack of ability to account for the two fuel rods at the Millstone-1 facility. That deficiency, however, appears to us to be a product of unusual circumstances. Moreover, deficiencies in fuel-rod management at Millstone-1 have been taken into account with respect to the SFP at Millstone-3. Although the missing fuel rods have never been located, the Licensee has demonstrated, to the satisfaction of the NRC Staff, both that the rods are unlikely to cause a problem regarding the public health and safety, and that the current Millstone-3 program is adequate to assure adequate implementation of the requirements for properly locating SFP fuel bundles. Further, as set forth above, DNC and the Staff have responded satisfactorily to the various other questions on related matters posed by the Board.

That being so, based on the foregoing discussion we conclude that, with respect to CCAM/CAM Reopened Contention 4, the Intervenor has not demonstrated any significant factual disputes of a type that would warrant an evidentiary hearing under 10 C.F.R. § 2.1113. Thus, the amended license authorizing expansion of the SFP remains in effect and this proceeding is terminated.<sup>13</sup>

2. This Memorandum and Order is effective immediately and, absent appeal, will become the final order of the Commission forty (40) days after date of issuance. See 10 C.F.R. §§ 2.760, 2.764. As provided by 10 C.F.R. § 2.786(b), within fifteen (15) days

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<sup>13</sup>Our termination of this proceeding does not foreclose a remand from the Commission of proposed CCAM/CAM Contention 12, concerning potential effects of terrorist acts on the SFP. We rejected that contention but referred our ruling to the Commission because of outstanding policy questions concerning the litigability of that type of contention. LBP-02-05, 55 NRC 131 (2002). The Commission accepted our referral (CLI-02-05, 55 NRC 161 (2002)), provided a briefing schedule for the parties, but has not yet ruled in this and in other proceedings raising similar issues.

after service of this Memorandum and Order, any party may file a petition for review with the Commission on the grounds specified in 10 C.F.R. § 2.786(b)(4). Any such petition must conform to the requirements set forth in 10 C.F.R. § 2.786(b)(2). Any other party, within ten (10) days after service of a petition for review, may file an answer supporting or opposing Commission review and conforming to requirements specified in 10 C.F.R. § 2.786(b)(3).

IT IS SO ORDERED.

The Atomic Safety and Licensing Board

*/RA/*

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Charles Bechhoefer, Chairman  
ADMINISTRATIVE JUDGE

*/RA/*

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Dr. Richard F. Cole  
ADMINISTRATIVE JUDGE

*/RA/*

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Dr. Charles N. Kelber  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
August 8, 2002

[Copies of this Memorandum and Order have been transmitted this date by e-mail to counsel for each of the parties.]

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
 )  
DOMINION NUCLEAR CONNECTICUT, INC. ) Docket No. 50-423-LA-3  
 )  
 )  
(Millstone Nuclear Power Station, )  
Unit No. 3) )

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB MEMORANDUM AND ORDER (DENYING REQUEST FOR EVIDENTIARY HEARING ON REOPENED CONTENTION 4, AND TERMINATING PROCEEDING) (LBP-02-16) have been served upon the following persons by U.S. mail, first class, or through NRC internal distribution.

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Washington, DC 20555-0001

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Docket No. 50-423-LA-3  
LB MEMORANDUM AND ORDER  
(DENYING REQUEST  
FOR EVIDENTIARY HEARING ON  
REOPENED CONTENTION 4, AND  
TERMINATING PROCEEDING) (LBP-02-16)

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[Original signed by Adria T. Byrdsong]

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Office of the Secretary of the Commission

Dated at Rockville, Maryland,  
this 8<sup>th</sup> day of August 2002