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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE COMISSION

In the Matter of:	:	Docket No. 50-423-LA-3
NORTHEAST NUCLEAR ENERGY COMPANY (Millstone Nuclear Power Station, Unit No. 3; Facility Operating License NPF-49)	:	ASLBP No. 00-771-01-LA
	:	NOVEMBER 13, 2000

CONNECTICUT COALITION AGAINST MILLSTONE
AND LONG ISLAND COALITION AGAINST MILLSTONE
PETITION FOR REVIEW OF LBP-00-26

Introduction

Pursuant to 10 C.F.R. Section 2.786(b), the Connecticut Coalition Against Millstone ("CCAM") and Long Island Coalition Against Millstone ("CAM") (collectively, "CCAM/CAM") hereby petition the Commission for review of LBP-00-26, Memorandum and Order (Adopting Agreed License Condition, Denying Request for Evidentiary Hearing on Other Issues and Terminating Proceeding)(October 26, 2000). The Commission should take review of clearly erroneous rulings in LBP-00-26 regarding administrative controls and criticality prevention issues.

I. SUMMARY OF DECISION

A. Factual Background

This petition for review concerns the license amendment application of the licensee, Northeast Nuclear Energy Company ("NNECO") to NRC on March 19, 1999 seeking to increase the storage capacity of the Millstone Unit 3 spent fuel pool ("SFP") from 756 assemblies to 1860 assemblies.[1]

[1] Condition Report #M3-99-1148 attached to the CCAM/CAMDetailed Summary and referenced in footnote 1 therein suggests that the expansion is sought in part to provide additional storage capacity for Unit 2 spent fuel as well, although the application itself and the Federal Register Notice published on September 7, 1999 make no mention of transfer of fuel from the Unit 2 SFP to the Unit 3 SFP, nor is the Millstone facility licensed to move spent fuel from Unit 2 to Unit 3.

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The existing Technical Specifications for Millstone 3 divide the presently installed racks into two regions. Per Technical Specification Definition 1.40, the Region 1 racks use a 3-out-of-4 configuration with a fuel cell blocker in the fourth location. Per Technical Specification Definition 1.41, the Region II racks do not have fuel cell blockers. Technical Specification Surveillance Requirement 4.9.13.1 controls placement of fuel in Regions I and II. When the fuel assembly enrichment and burnup parameters are to the right of the line drawn on Technical Specification Figure 3.9-1, a fuel assembly cannot be stored in a Region II rack.

NNECO seeks permission to install up to fifteen (15) additional racks in the spent fuel pool at Millstone Unit 3. Five (5) of the proposed new racks will be 7 X 10 arrays using Boral as the neutron absorption material. NNECO proposes to designate these five new racks as Region 1 of the SFP. The company seeks to use Region 1 to store fuel assemblies with a nominal 5.0 w/o U-235 enrichment in a 3-out-of-4 configuration without burnup restrictions. In the 3-out-of-4 configuration, a fuel cell blocker is proposed for criticality control. The application also provides for fuel assemblies to be stored in Region 1 in a 4-out-of-4 configuration (i.e., no cell blockers) when restrictions are placed on burnup and enrichment.

The remaining ten (10) proposed new racks have varying array dimensions using Boral as the neutron absorption material. NNECO proposes to designate these ten new racks as Region 2 of the spent fuel pool. The application provides for fuel assemblies to be stored in Region 2 in a 4-out-of-4 configuration (i.e., no cell blockers) with restrictions placed on burnup and enrichment. These restrictions are more restrictive than those imposed on storage in Region 1 racks.

NNECO proposes to re-designate the 21 existing racks as Region 3 of the SFP. The application provides for fuel assemblies to be stored in Region 3 with more restrictions on burnup and enrichment than imposed on the Region 2 (and 1) racks. In addition, the application provides for credit to be taken for the decay of fissile plutonium and the buildup of americium over time for the irradiated fuel stored in the Region 3 racks.

B. Procedural Background

CCAM/CAM filed a request for a hearing on the proposed license amendment. On

February 9, 2000, the Licensing Board issued its Prehearing Conference order (Granting Request for Hearing), LBP-00-02, 51 NRC 25, finding both CCAM and CAM to have established their standing and three of their joint contentions (numbers 4, 5 and 6) to be admissible. Contention 4 asserts that NNECO's proposed reliance on a new set of administrative controls trades reliance on physical protection for administrative controls to an extent that poses an undue and unnecessary risk of a criticality accident, particularly due to the fact that the licensee has a history of not being able to adhere to administrative controls with respect, *inter alia*, to SFP configuration. Contention 5 asserts that the proposed change in schedule of surveillance of the soluble boron in the SFP will lead to a significantly increased likelihood of a criticality accident stemming from a misloaded fuel element, during the interval between fuel movements.[2] Contention 6 asserts that NNECO's application proposes to prevent criticality at Millstone 3 by the use of ongoing administrative methods and that reliance on such administrative methods violates NRC Regulations, namely, General Design Criterion 62, which requires that "Criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations."

As permitted by 10 CFR Section 2.1111, NNECO invoked the hybrid hearing process. Following a discovery period, the parties filed summaries of their factual evidence and legal arguments, along with sworn statements by their technical experts.[3]

On October 26, 2000, the Licensing Board issued its decision denying CCAM/CAM's request for evidentiary hearing and terminating the proceeding.

II. THE COMMISSION SHOULD GRANT REVIEW OF LBP-00-26

A. The Board's Conclusion Regarding Contention 4 Is Contrary to the Evidence

The Board's conclusion that there is no genuine nor substantial dispute of fact

[2] Contention 5, and its disposition in the Licensing Board proceedings, is not a subject of this petition for review.

[3] See Detailed Summary of Facts, Data and Arguments and Sworn Submission on Which Connecticut Coalition Against Millstone and Long Island Coalition Against Millstone Intend to Rely at Oral Argument to Demonstrate the Existence of a Genuine and Substantial Dispute of Fact With the Licensee Regarding the Proposed Expansion of Spent Fuel Storage Capacity at the Millstone Unit No. 3 Nuclear Power Plant."

which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing is clearly erroneous and not support by the facts on record.

The proposed license amendment would significantly increase the probability of a criticality accident at the Millstone SFP through the interaction of five factors:

(a) The amendment would lead to increased complexity of the administrative controls upon which NNECO will rely to prevent a criticality accident;

(b) Failure of administrative controls can lead to a criticality accident and a failure of this type is more likely if administrative controls are more complex;

(c) Criticality calculations can contain errors and reliance on administrative controls of increased complexity will increase the potential that such errors will lead to a criticality accident;

(d) Experience shows that administrative controls on fuel positioning are likely to fail and failure is more likely if these administrative controls are more complex; and

(e) There is a significant probability that the concentration of soluble boron in the pool water will be insufficient to prevent a criticality accident at the time of or subsequent to a fuel mispositioning event.

Moreover, Millstone's well-known and documented record of failure to adhere to administrative controls, acknowledged by the Licensing Board in its decision,[4] and human factors issues combine to increase the risk.

In these proceedings, CCAM/CAM provided documentary evidence regarding each of the above factors.

For example, the proposed amendment would increase the number of parameters affecting storage in the Millstone Unit 3 spent fuel by 50 per cent. The current pool storage options are dependent on two parameters (enrichment and burnup) while the proposed pool storage options would rely on three parameters (enrichment, burnup and

[4] E.g., "As a genesis for this claim [Contention 4], we note that among the reasons leading to the voluntary shutdown of Millstone Unit 3 (following its being placed on the Commission's "Watch List" because of numerous regulatory violations) from1996 to 1998 was NNECO's past failure to adhere to technical specifications concerning, *inter alia*, placement of fuel in the SFP and, indeed, NNECO's inadequate corrective measures and, in some cases, its attempts to cover up similar failures." LBP-00-26, slip. op. at 3-4. And "It is common knowledge that the Millstone plant has been plagued by many problems, including maintenance problems." Id, slip. op. At 9.

decay time). As illustrated in their Detailed Summary,[5] the proposed amendment significantly increases the complexity of administrative controls on the positioning of fuel in the pool – and, consequently, provides significantly more opportunities for a fuel mispositioning event – by creating a variety of new enrichment, burnup and decay time combinations.

The April 26, 1994 incident at Millstone Unit 3, when a fuel assembly was lowered into the wrong SFP cell,[6] illustrates the variety of technical and human pressures at work in 1994, when the administrative controls were far **simpler** than those presently proposed. The crane operator lowered the fuel assembly six inches before the error was noticed. He reported poor lighting conditions. ("[D]ue to the poor lighting in that area, I did not see the fuel assembly.The PEO also checked, but he, apparently, did not see it either."[7] He reported fatigue due to overwork. ("Also I've been up since 0130. I came in to work 0500.") He reported distractions. ("I was holding a conversation with Tom concerning mode zero alternate fuel pool cooling. I forgot to cross out the cell we had just loaded.") He reported inadequate procedures. ("The engineer should have a better way of keeping track of fuel assemblies.") **He reported confusing procedures**. ("Some confusion may be created by the number of procedures in use.")[8]

The Reactor Engineering Logs for Refueling Outage 6 at Millstone Unit 3, May 11 to June 4, 1999, submitted by CCAM/CAM, illustrate the licensee's cavalier approach to refueling operations at the Millstone Station just as the NRC was reducing its oversight of Millstone operations.[9] According to NNECO's own internal documents, persistent equipment failures, including the failure of the SFP crane and the primary communication system, "**affected the efficiency of the refueling operations and**

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[5] See CCAM/CAM "Detailed Summary of Facts, Data and Arguments and Sworn Submission," Table IV-1 and notes thereto.

[6] This incident is discussed in CCAM/CAM "Detailed Summary," at 42 *et seq.*

[7] Even after this fuel mispositioning event, NNECO acknowledged, through the deposition testimony of Michael C. Jensen in May, 2000 that it can still be four to five years before blown light bulbs are replaced in the spent fuel pools at Millstone owing to their cost, several thousand dollars.

[8] After the mispositioning event at Millstone Unit 3 on April 26, 1994, the crane operator recognized that he should have notified the shift supervisor when the misplacement occurred and fuel movement should have been halted. According to the reactor engineering log of the incident, the crane operator "explained that it would be easier if we had bigger numbers on the bridge."

[9] The Licensing Board correctly reported that the Commission's perception of improved plant performance led it to close its order requiring third-party oversight on March 11, 1999, two months prior to the RFO6 debacle at Millstone Unit 3. LBP-00-26 at 7.

potentially challenged the safe handling of the fuel. Had the equipment failed in a manner such that a fuel assembly could have been damaged or been unable to be moved to a safe location, severe challenges to nuclear fuel safety could have occurred."[10]

With regard to each issue presented in Contention 4, CCAM/CAM presented documentation, including license event reports. However, the Licensing Board sided with NNECO and NRC staff in resolving all factual issues in favor of the licensee and thereby concluding the absence of a genuine and substantial dispute of fact which would necessitate an evidentiary hearing.[11] Such fact-finding on the present record was clearly erroneous.[12]

For example, the Licensing Board set and followed an inappropriately high legal threshold. The decision implicitly faults CCAM/CAM for failing to provide evidence of actual criticality events at the Millstone spent fuel pools. In the absence of such evidence, the decision simply disregards the crux of Contention 4: that is, that NNECO's proposed reliance on a new set of administrative controls trades reliance on physical protection for administrative controls to an extent that poses an **undue and unnecessary risk** of a criticality accident. It is the increased **risk** of criticality which makes the present license amendment unacceptable. Unusual among safety regulators, the Licensing Board's position on safety risks seems to be: wait until **after** the death count to complain. As recent experience in the auto tire industry demonstrates, this standard falls far short of protecting public health and safety from unnecessary and known risks. The decision does not comport with the fundamental obligation of the board to act in the public interest.

Similarly, the Licensing Board excuses the reckless events of the RFO6 at Millstone Unit 3 by accepting NNECO's "commitment" to it that it intends to repair or replace its refueling equipment prior to RFO 7. ("[T]he licensee is currently proceeding with corrective action plans to replace both the Unit 3 fuel transfer system and SIGMA

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[10] Condition Report, CR-M3-2236 ("Adverse Trend in Performance of the Refueling Equipment"), annexed as Exhibit 8 to the CCAM/CAM "Detailed Summary."

[11] See 10 CFR Section 2.1115(b)

[12] The Licensing Board's reliance on NRC staff recommendation is disturbing, particularly in light of the staff's own reliance upon an uninformed technical staff, one of whom had been assigned review of the Millstone Unit 3 spent fuel pool expansion amendment although he (1) had never reviewed a SFP amendment before; (b) had never inspected a spent fuel pool; and (c) understood that acceptance criteria are established by the licensee. See deposition transcript of Dr. Anthony C. Attard, May 11, 2000.

refueling machine prior to the start of the next refueling outage, scheduled for 2001.") There is no evidence in the record that this is a binding commitment. It certainly is not a condition of license approval. Indeed, the "commitment" by NNECO's legal counsel contradicts the actual evidence in the record that the "irregularities" of RFO 6 are due to systemic mismanagement, can be expected to be repeated and corrective actions known to be necessary may not be carried out.[13]

Moreover, the Licensing Board erroneously failed to consider that deregulation is underway, and the sale of the Millstone Station imminent. Consequently, its reliance on a commitment as to what NNECO may do in the future to carry out corrective actions is completely misplaced.[14] The record is absent any commitment from any prospective purchaser of the Millstone Nuclear Power Station that it will replace the Unit 3 fuel transfer system or the SIGMA refueling machine. Thus, the Board's finding that ". . . NNECO has demonstrated that it can adhere to administrative controls with adequate safety margin and defense-in-depth, without posing an undue or unnecessary risk to plaint workers or the public" is without support in the record and irrelevant.

Indeed, the Licensing Board decision bespeaks its own reckless disregard for safety. The decision states: "Misoperation of the fuel transfer system imposes an economic penalty on NNECO; it does not affect the actual location of the fuel in the SFP. Hence,

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[13] See Memorandum of J.F. Beaupre, Unit 3 Technical Support Engineering (June 24, 1999)("Corrective actions to resolve previously-identified fuel handling system equipment problems are frequently ineffective. The SIGMA control problems were identified in RFO4, yet an EWR to upgrade the control system was not scheduled for implementation until Cycle 7. When the SIGMA cable supplied with a mast modification was identified as being too short, an effort to replace the cable with the proper length should have been initiated. An EWR to replace the spent fuel bridge hoist manual chain drive with a simpler design was approved, but the design change was given low priority and not completed prior to RFO6. The transfer cart holddown latch was modified after RFO1, yet failed to operate properly during RFO5 and RFO6. Efforts to repair the latch during RFO5 were unsuccessful. The new transfer cart holddown latch springs appear to be too weak to overcome friction in the latch bashing and return the latch to center. The transfer tube gate valve reach rod had slipped down during RFO5 and a modification to the support was not fully effective. Problems with the communications system were identified in RFO5 and were not effectively resolved prior to RFO6. . . . Preparing the fuel handling system for refueling is given low priority while the plant is online. Preventive maintenance which is scheduled months before the outage is frequently deferred to a later date because of other priorities. This results in significant pressure to complete the fuel handling system PMs in a short time, immediately prior to outage. The consequences of delaying the PMs is that problems identified must be corrected quickly and this sometimes results in the ineffective corrective actions previously identified."

[14] During oral argument on July 20, 2000, CCAM/CAM explicitly asked the Licensing Board to consider the fact that the sale of Millstone was underway and the present licensee would soon be absolved of any responsibility to the NRC or the public to perform corrective actions or otherwise promote safe practices at Millstone. The Licensing Board's explicit refusal to consider such issue was error.

there is an economic incentive for NNECO to make the proposed repairs, and no safety significance if they do not."[15] Even the licensee, in internal communications, recognizes the reality of stark safety consequences from fuel mishandling in the SFP. See discussion supra at 5. ("Had the equipment failed in a manner such that a fuel assembly could have been damaged or been unable to be moved to a safe location, severe challenges to nuclear fuel safety could have occurred.")

The Licensing Board further erred in denying CCAM/CAM's request for evidentiary hearing in the complete absence of an articulation of standards, and the absence of any written standards, governing consideration of the application in question. The Licensing Board substituted for standards: (a) a recognition that no reported criticality has yet occurred at the Millstone spent fuel pools and (b) blind acceptance of assurances by the licensee and NRC staff that the risks are too small to be of consequence. The decision has no reference to standards nor analysis as to how such standards were applied to the pertinent issues. The Board simply accepted the licensee's "risk assessment," that a "one in 3,000" error rate of fuel assembly misplacement was sufficient to establish "no genuine and substantial dispute of fact," notwithstanding that CCAM/CAM did not accept the licensee's risk assessment and countered with numerous examples of actual fuel assembly misplacement at Millstone and elsewhere.

B. The Board's Conclusion Regarding Contention 6 is Contrary to Law

The Licensing Board committed clear error in concluding that General Design Criterion 62 does not prohibit the use of ongoing administrative controls such as are sought to be used by NNECO.

General Design Criterion 62 provides as follows:

"**Prevention of criticality in fuel storage and handling.** Criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations." 10 CFR Part 50, Appendix A.

The Licensing Board found that it could not rule out NNECO's proposed criticality prevention measures under this standard. The Board was able to reach its conclusion only

[15] LBP-00-26 at 9.

by ignoring the plain language of GDC 62 and the relevant regulatory history provided by CCAM/CAM.

As the Board acknowledged, its interpretation of GDC has never been explicitly endorsed by the Commission itself.[16]

To the contrary, the Commission plainly defined the limits of acceptable criticality prevention measures in GDC 62 by insisting that they must be "physical systems and processes"and by providing an example: "geometrically safe configuration."

The Board's decision is legally flawed. Its central flaw establishes a chief reason why GDC 62 must be interpreted to preclude ongoing administrative controls, namely, the need to differentiate among possible administrative controls to preclude those which would be insufficient or inappropriate to prevent criticality and protect the public health and safety.

The Board ruled:

"Nothing in the definition places limitations on the type of controls used – with the end in this case being adequate criticality control, as set forth in GDC 62. It follows that there is no basis in law or language for differentiating between one type of administrative control and another."

Without a basis in law or language to differentiate between various types of administrative controls, there is no basis in law, language or practice, and no set of legal standards, by which to measure and assess the propriety of using administrative controls to prevent criticality.

Further, in holding that administrative measures are among the activities permitted under GDC 62, the decision fails to explain what measures are **excluded**. Consquently, the Board's interpretation strips the limiting language of GDC 62 of any meaning. LBP-00-26 should be reviewed because it is inconsistent with the plain language of GDC 62.

Just as the NRC lacks a database of administrative controls employed at spent fuel pools subject to its regulation, and similarly lacks a database of errors at such pools,[17] so, too, there is no centralized, publicly accessible database that provides detailed information about the rack configuration at each nuclear power plant SFP and the history

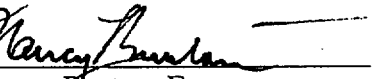
[16] LBP-00-26 at 16.
[17] Refer to deposition testimony of Dr. Laurence I. Kopp, Exhibit 25, page 66.

of rack installation at each pool. Still, it is known that measures for criticality prevention at nuclear power plants have evolved over time in response to increasing demand for higher and higher density spent fuel storage. This evolution has gone beyond the bounds of measures that are consistent with GDC 62. The NRC and its staff have condoned violations of GDC 62 by approving many license amendment applications that permit the use of administrative controls for criticality prevention in the high-density storage of spent fuel. Such evolution represents a significant relaxation of requirements for criticality prevention measures. The current NRC staff practice of permitting licensees to substitute procedural measures for physical criticality prevention measures represents a widespread departure from the plain language of GDC 62. No attempt has been made to evaluate the legality of this practice or its safety. The Commission has never addressed the proper interpretation of GDC 62 in an adjudication.

C. This Petition Presents Substantial and Important Questions of Law and Policy and Clearly Erroneous Findings

The Commission should review LBP-00-26 because it presents substantially erroneous findings of fact and raises important questions of law and policy not previously adjudicated by it. The issues are of critical import to the Intervenors, CCAM and CAM, and the constituencies they represent as well as to the entire industry. Accordingly, the Commission should take review of the issues presented in this petition.

THE INTERVENORS
CONNECTICUT COALITION
AGAINST MILLSTONE
LONG ISLAND COALITION
AGAINST MILLSTONE

By: 

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UNITED STATES OF AMERICA
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	:	NOVEMBER 13, 2000

CERTIFICATE OF SERVICE

I hereby certify that copies of "CONNECTICUT COALITION AGAINST MILLSTONE AND LONG ISLAND COALITION AGAINST MILLSTONE PETITION FOR REVIEW OF LBP-00-26" in the above-captioned proceeding have been served on the following by E-Mail as indicated by asterisk and to all by conforming copy via U.S. Mail, postage pre-paid, on November 13, 2000:

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