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March 24, 1995

George Mencinsky
U.S Nuclear Regulatory Commission
Two White Flint North
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11545 Rockville Pike
Rockville, MD 20852

SUBJECT: ***FIN L-2590, "Safety and Regulatory Issues Related to the Permanently Shutdown Nuclear Power Plant" - Discussion of the ACRS Comments on the Proposed Revisions to the Decommissioning Rule.***

Dear George:

It is our understanding that the ACRS had several comments based on their recent review of the proposed revisions to the Decommissioning Rule. A primary concern was the apparent lack of a clear relationship between the requirements being retained in the revised rule and the realistic risks to the public health and safety. Since many of the proposed changes to 10CFR50 that are associated with this proposed rulemaking, originate in FIN L-2590, it is appropriate to review the programmatic goals and processes.

The purpose of the permanent shutdown (PSD) program (FIN L-2590), is to determine the extent and types of safety criteria that should remain as part of the decommissioning regulations to assure that the health and safety of the public is protected. Previous decommissioning studies (NUREG/CRs-0130 and 0672) have established that the offsite consequences associated with postulated accidents not involving spent fuel, are negligible. Therefore, the focus of this study has been on the spent fuel storage alternatives that are likely to occur after a plant is permanently shutdown, and the potential public health and safety consequences associated therewith.

After the reactor vessel is defueled the typical accident sequences that dominate the operating plant risk are no longer applicable. The remaining source of public risk is associated with the accidents that involve the spent fuel stored in the spent fuel pool. Accidents involving spent fuel, although limited to the 1/3 core offloads associated with refueling were considered as part of the spectrum of nuclear power plant risk as early as the Reactor Safety Study. More recently, Sandia National Laboratory studies, including NUREG/CR-0649, have indicated that spent fuel pool drainage, with certain combinations of spent fuel storage configurations and decay times, could cause freshly discharged fuel assemblies to self heat to a temperature where the oxidation of the zircaloy fuel cladding may become self sustaining." Follow-up efforts by BNL (NUREG/CR-4982) applied simplified PRA analyses to quantify the frequency of initiating events that could compromise the SFP integrity; the conditional probability of subsequent system failure, fuel failure, finally probability; the magnitude of radionuclide releases to the environment and the consequences of those releases. NUREG-1353 was used to close the generic issue of beyond design basis accidents in the spent fuel pool for operating plants. It describes a value/impact assessment of various proposed options intended to reduce the risk posed by these potential accidents. The insights of these studies have been applied to FIN L-2590.

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This program has defined four (4) spent fuel configurations which encompass all anticipated spent fuel characteristics and storage modes following permanent shutdown. Spent fuel which, due to a combination of storage geometry, decay time, and reactor type, can support rapid zircaloy oxidation is designated as Spent Fuel Storage Configuration 1 - "Hot Fuel in the Spent Fuel Pool." Configuration 1 encompasses the period commencing immediately after the offload of the core to a point in time when the decay heat of the hottest assemblies is low enough such that no zircaloy oxidation take place, and the fuel cladding will remain intact (i.e., no gap releases).

At this point the fuel is considered to be in Configuration 2 - "Cold Fuel in the Spent Fuel Pool." The fuel can be stored on a long-term basis in the spent fuel pool, while the rest of the plant is in SAFSTOR or decontaminated (partial decommissioning). Alternatively, after decay heat loads have declined further, the fuel can be moved to an ISFSI (designated as spent fuel storage Configuration 3). This would allow complete decommissioning of the plant and closure of the Part 50 license.

Given the present unavailability of a permanent geological high level waste repository, or an interim Monitored Retrievable Storage (MRS) facility the fuel is expected to remain onsite for an unspecified time period.

[illegible] under the [illegible]

At some point in the future, a MRS facility or a high level waste repository will become available. Spent fuel storage Configuration 4 assumes all spent fuel and high level waste has been shipped offsite. This configuration assumes the plant Part 50 license remains in effect only because the plant has not been fully decontaminated and cannot be released for unrestricted public access.

Each of these configurations was further defined to support the consequence analyses and the regulatory assessment including:

- Representative BWR/PWR plant and fuel pool data
- Accident initiator and timing
- Representative accident sequences
- Meteorological and population data
- Accident inventory and source term

This considered future end-of-life nuclear power plant shutdowns, as well as plants that have prematurely ceased operations. Thus, this study postulated: higher end of life fuel burnups than presently experienced; spent fuel pools at full capacity; and a high population density to account for future industry and population trends.

Consequence analyses have been completed or are in process for all four spent fuel storage configurations. The offsite economic and health consequences range from significant (configuration 1) to negligible (configuration 4).

A regulatory assessment was performed for each configuration. A list of candidate regulations (technical issues) were identified from a screening of 10CFR Parts 0-199. Each of these technical issues was subjected to a detailed review which included federal register notices, SECY memos, NRC policy statements, regulatory guides, standard review plans, NUREG reports, NUREG/CR reports, etc. to develop an under-

standing of the regulatory bases. The continued applicability of each technical issue was assessed within the context of each spent fuel storage configuration, the results of the consequence analyses, and the expected plant configuration.

Approximately 20 technical issues have been identified that are not applicable (or are only partially applicable) to one or more of the spent fuel storage configurations of the permanently shutdown nuclear power plant. These issues can be grouped into the following broad categories:

1. Technical issues that are not relevant to all permanently shutdown configurations.

The public risk associated with a permanently shutdown nuclear power plant is very different from an operating unit, both in magnitude and content. Accident sequences such as LOCAs and ATWS are no longer relevant to the defueled facility. Regulations that are designed to protect the public against full power and/or design basis accidents are no longer applicable, and can be deleted for the permanently shutdown plant. These regulations include: Combustible Gas Control (50.44), ECCS Acceptance Criteria (50.46), Containment Leakage Testing (50.54(0), Appendix J), and ATWS Requirements (50.62).

2. Technical issues that remain partially applicable to one or more permanently shutdown plant configurations.

Other regulations, although based on the full power operating plant, may continue to be partially applicable to the permanently defueled facility. Typically, the scope of these requirements can be reduced to eliminate those portions that do not pertain to the safe storage of the spent fuel or are no longer necessary to protect the health and safety of the public. These regulations include: Technical Specifications (50.36, .36b) and the Fire Protection Program (50.48, Appendix R).

3. Technical issues that remain applicable to configurations 1 and 2 of the permanently shutdown plant.

The special nuclear material control requirements of Parts 70 and 74 should continue as long as fuel remains within the plant.

The insurance issues (50.54(w) and Part 140) and the emergency preparedness requirements (50.47, 50.54(q), (t) and Appendix E) are being evaluated using the accident consequence analyses of this study. Since the estimated consequences for the configuration 1 accident are significant, we anticipate that the insurance requirements and the emergency planning requirements should continue for configuration 1. BNL expects to provide a basis for reduced emergency planning and insurance requirements for the remaining configurations.

Although the program has progressed significantly, there are several remaining issues that are in process. In addition to the completion of the configuration 3 consequence analysis, work is ongoing to determine the configuration 1 critical decay time. The critical decay time is defined as the maximum duration, measured with respect to reactor shutdown when the most recently discharged fuel assemblies would heat to the point that clad oxidation would become self sustaining. This is important to determine the end of configuration 1 and an expected reduction in emergency planning and insurance requirements.

In summary, the program has examined the safety and regulatory issues associated with the permanently shutdown nuclear power plant using 4 spent fuel storage configurations. Each configuration was further defined to support the consequence analysis using a representative accident sequence. These analyses were used with expected physical plant configurations to assess the continued applicability of the regulations.

Please note that a decommissioning risk analysis is beyond the scope of this program. In addition, the present body of regulation is prescriptive in nature, without explicit risk bases.* The programmatic process described herein with its explicit consideration of offsite consequences provides a structured approach to the examination of regulatory applicability for the PSD plant.

We believe that this overview put the present proposed revisions in perspective and help assure the ACRS that the final result will be a Decommissioning Rule that addresses all pertinent regulations.

If we can be of further assistance please feel free to call Ed Grove or me.

Sincerely,

Rich Travis

Richard J. Travis
Probabilistic Safety Technology Applications Group
Engineering Technology Division

RJT/pc
cc: R. Bari
R. Duffey
E. Grove
H. Nourbakhsh
J. Taylor

*Risk-based regulatory initiatives are presently ongoing for containment leak testing and fire requirements. BNL concurs with the ACRS that risk-based regulation for the permanently shutdown plant could be useful, especially for certain configuration 1 technical issues.

May 23, 1995

MEMORANDUM TO: James M. Taylor
Executive Director for Operations

FROM: John C. Hoyle, Secretary /s/

SUBJECT: SECY-95-051 - PROPOSED RULEMAKING - REVISION TO 10 CFR PARTS 2, 50, AND 51, RELATED TO DECOMMISSIONING OF NUCLEAR POWER REACTORS

The Commission (with the Chairman and Commissioners Rogers and de Planque agreeing) has approved publication of the proposed rule with the changes indicated in the attachment. The Commission (with the Chairman and Commissioner Rogers agreeing) approved the addition of provisions for conducting a public meeting when the licensee termination plan is submitted. Commissioner de Planque would have preferred that the public meeting be optional and determined on a case-by-case basis.
(EDO) (SECY Suspense: 6/23/95)

The Commission found that this proposed rulemaking should proceed as presented in SECY-95-051 and revised above, notwithstanding the ACRS concerns expressed in their letter dated March 17, 1995, since the proposed rule is primarily directed toward the procedural process for decommissioning and the staff's approach to safety issues in the proposed rule is reasonable under the current state of the relevant data and analysis. Otherwise, the Chairman encouraged the staff to consider the concerns expressed by the ACRS, and to consider whether additional rulemaking is necessary after Brookhaven National Laboratory completes its evaluation of risk associated with the presence of spent fuel at the site of permanently shutdown reactors.

Commissioner Jackson did not participate in this matter.

Attachment:
As stated

cc: The Chairman
Commissioner Rogers
Commissioner de Planque
Commissioner Jackson

OGC
OCA
OIG
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
SECRETARY

IN RESPONSE, PLEASE
REFER TO: M950629

June 29, 1995

MEMORANDUM FOR: James M. Taylor
Executive Director for Operations

John F. Cordes, Acting Director
Office of Commission Appellate Adjudication

FROM: John C. Hoyle, Secretary /s/

SUBJECT: STAFF REQUIREMENTS - AFFIRMATION/DISCUSSION AND VOTE, 11:30 A.M., THURSDAY, JUNE 29, 1995, COMMISSIONERS' CONFERENCE ROOM, ONE WHITE FLINT NORTH, ROCKVILLE, MARYLAND (OPEN TO PUBLIC ATTENDANCE)

I. SECY-95-043 - FINAL RULE ON "CLARIFICATION OF DECOMMISSIONING FUNDING ASSURANCE REQUIREMENTS"

The Commission[1] (with the Chairman and Commissioners Rogers and de Planque agreeing) approved the final rule amending the decommissioning sections of 10 CFR Parts 30, 40, 70, and 72. Commissioner Jackson did not participate in this matter.

Commissioner de Planque, although approving the final rule, would have preferred to defer implementation of the rule until the decommissioning criteria rule had been finalized and in effect. Further, she would have preferred that the States be allowed flexibility in meeting compatibility requirements that are not addressed neatly under Levels 2 or 3.

The Federal Register notice should be reviewed by the Rules Review and Directives Branch in the Office of Administration and forwarded to the Office of the Secretary for signature and publication.

(EDO) (SECY Suspense: 7/21/95)

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[1] Commissioner Jackson was on official travel and did not attend this meeting.

II. SECY-95-157 - SEQUOYAH FUEL CORPORATION AND GENERAL ATOMICS; LBP-95-05 RULING ON MOTIONS FOR PROTECTIVE ORDER

The Commission (by a vote of 3-1[2], with the Chairman and Commissioners de Planque and Jackson agreeing) has approved the proposed order granting staff's petition for review, as modified in the attachment. Commissioner Rogers disapproved the proposed order and would have preferred to wait for the case to be concluded prior to taking review.

(Subsequently, on June 29, 1995, the Secretary signed the Order.)

Attachment:
As stated

cc: The Chairman
Commissioner Rogers
Commissioner de Planque
Commissioner Jackson
OGC
OCA
OIG
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR - Advance
DCS - P1-24

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[2] Section 201 of the Energy Reorganization Act, 42 U.S.C. §5841, provides that action of the Commission shall be determined by a "majority vote of the members present." Commissioner Jackson was not present when this item was affirmed. Accordingly, the formal vote of the Commission was 2-1 in favor of the decision. Commissioner Jackson, however, had previously indicated that she would approve this paper and had she been present she would have affirmed her prior vote.