RELATED CORRESPONDENCE

April 19, 1983


UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the

ATOMIC SAFETY AND LICENSING BOARD

| | | |
|---|---|---|
| In the Matter of | ) | Docket No. 50-309-OLA |
| | ) | |
| MAINE YANKEE ATOMIC POWER COMPANY, | ) | (To Increase and Modify |
| | ) | |
| (Maine Yankee Atomic Power Station), | ) | Spent Fuel Pool Storage |
| | ) | |
| Applicant. | ) | and Systems; Compaction) |

SENSIBLE MAINE POWER'S FIRST RESPONSE TO
NRC STAFF INTERROGATORIES AND REQUEST FOR DOCUMENTS,
AND MOTION FOR LEAVE TO FILE SAME

Intervenor Sensible Maine Power, ("SMP"), here responds to NRC Staff Interrogatories and Request for Production of Documents, and additionally moves this Board for leave to file the same, time having expired, the answers having been due April 11, 1983, per agreement between counsel.

The primary reason for this delay is the tardiness and insufficiency of responses by Applicant in answering SMP's first set of interrogatories.[1] SMP served said interrogatories upon Applicant on or about October 25, 1982, and per agreement between counsel they were accepted by Applicant as served February 8, 1983. Thus answers were due from Applicant on or about February 22, 1983. However, no answers were forthcoming from Applicant until March 29, 1983.[2]

Further, such response as has thus far been made by Applicant fails to provide adequate information upon its proposed d/r/c scheme, and especially upon the pinpacking aspects of the same.[3]

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[1] It remains SMP's position that the NRC Staff has also failed of its duty to secure and provide sufficient information upon all aspects of Applicant's proposed scheme, especially pinpacking.

[2] SMP's technical advisor received Applicant's response on or about April 1, 1983; however, SMP counsel did not receive same until April 9, 1983, because Applicant's counsel mailed it to the prior address; Applicant has had notice of SMP counsel's current address since July of 1982.

[3] SMP anticipates filing a Motion to Compel within the next week, which filing will further specify these insufficiencies.



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The immediate and controlling effect of these factors is that SMP has been and remains handicapped in framing complete, prompt answers to the Staff's discovery.

However, SMP here responds as completely and promptly as possible under the circumstances noted, and acknowledges its on-going duty to supplement responses as additional information becomes available. Nothing by way of response here is intended to limit SMP in making and relying upon such supplementation.

Last by way of introduction, SMP joins certain responses of the State of Maine, where applicable, as noted more particularly below.

INTERROGATORY 1

Q1-1

Please specify the means by which workers would "receive more than allowable dosages from increased handling of denser fuel assemblies." as all assemblies will be"handled" through more than twenty feet of water shielding.

RESPONSE

Increased handling means increased time at any given level of exposure. Since Applicant has failed to identify the means of disassembly—reassembly, it remains beyond this intervenor to ascertain how the Applicant has shown that exposure levels will be kept at ALARA or even below regulatory limits. It should be noted here, however, that increased handling will assuredly result in dislodging additional radio-cobalt crud, adding to pool shine. The additional dosage cannot be quantified until Applicant responds fully to discovery in this area. Please see NRC Staff's Safety Evaluation by the Office of Nuclear Reactor Regulation, Docket No. 50-309, Enclosure 1 in a letter from Robert A. Clark, Hief, Operating Reactors Branch No. 3, Division of Licensing, to MYAPS, dated June 16, 1982, page 18, Section 2.7, Paragraph 2.7.1: "To allow flexibility in the modification plan, the licensee is not specific in the manner in which the modification sequence will be performed." Insofar as exposure mitigation "through more than twenty feet of water" is concerned, please refer to a letter from Robert W. Reid, Chief, Operating Reactors Branch No. 4, Division of Operating Reactors, to MYAPS, dated January 28, 1980, page 2, Question 9: "(W)ater shielding the pin may be reduced by about fourteen feet as the pin is lifted towards the surface of the pool from the standard assembly for reinsertion into a modified one". Thus the shielding will be significantly less than the twenty feet asserted.

Last, SMP joins in, and incorporates by reference, the well-drawn response of the State of Maine to "Q1-1".

Q1-2

What do you feel constitutes "NRC regulatory limits" within which the d/r/c proposal must operate? Identify as to regulatory sections and quantitative dosages. (State 4).

RESPONSE

By its express terms this interrogatory is not applicable to SMP's Contention No. 1. However, insofar as it may be applicable by mention of "NRC regulatory limits" in said Contention, SMP joins in and here incorporates by reference the response of the State of Maine hereto.

Q1-3

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 1/State 4?

RESPONSE

SMP has been and is currently drawing technical advice and entertaining document review from a number of persons none of whom has been relied upon in outstanding portion to develop any single contention. SMP Contention No. 1, for example, was developed in large part from a perusal of officially-expressed NRC concerns regarding worker exposures during the d/r/c scheme as memorialized in letters from various NRC branches requesting information on the same from Applicant. It was the view of all of SMP's technically-oriented sources that "the Applicant has failed to demonstrate" that occupational exposures would be kept ALARA or within regulatory limits. No records of phone or in-person conversations on these subjects were made or retained by SMP.

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in area of expertise, and a bibliography of any publications of the proposed experts.

RESPONSE

Curriculum vitae for the principal persons with whom SMP has consulted for technical critique and input are included in the enclosed "Appendix". (Please see.) At present, and until the Applicant is more forthcoming with detailed information regarding its proposed d/r/c scheme, SMP does not propose anyone as an expert in these proceedings.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

RESPONSE

SMP is currently negotiating the contracts of expert witnesses and cannot at this time state whether any of the above or anyone else will appear as a witness on this or any other contention. SMP will provide

all of the requested data as available in a timely manner when such witnesses are contracted.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

RESPONSE

Because, as Applicant has said in its early submittals, "(t)his information is vendor specific", no response can be made to this question until at least one if not both of the following conditions are met: (1) Applicant has been more forthcoming regarding its d/r/c scheme; and (2) SMP has contracted witnesses to substantiate specific individual contentions. When and as full, complete and responsive answers are received from Applicant, then SMP will be able to identify witnesses and to specify their testimony.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

RESPONSE

Please see the enclosed general "Bibliography" of documents and other materials from which SMP's contentions have cumulatively or generally received support or substantiation. Documents listed which relate to specific individual contentions or to the input of specific persons providing technical input to SMP are so identified. At present there are no plans to introduce or exclude any of the listed documents or materials from the proceeding, for which reasons please see above, (Responses to a, b, c and d).

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable) publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

A general, referenced and annotated (as to application) "Bibliography" is enclosed herewith. (Please see response to part "e" above.) For the reasons cited above, (parts "a-e"), SMP cannot include or exclude the materials listed in this bibliography as likely to be presented as evidence or in cross-examination. All materials thus far cited in support of SMP contentions are NRC or Applicant (available to NRC) materials. Other materials included in the list have not to date

been cited and are for the most part contents of the libraries of SMP or its consultants or copies of testimonies given before various NRC panels by "experts" under consideration for contract to participate in this proceeding. This bibliography anticipates other data requests in this set of interrogatories by including all materials as defined on page 2, part 2, of "NRC Staff Interrogatories". As experts are contracted or as other material which SMP definitely intends to introduce into the proceeding becomes available to SMP and/or as SMP qualifies materials already in its possession as suitable for introduction to the proceedings in support of its contentions, that material shall be made available to NRC Staff in a prompt and timely manner.

INTERROGATORY 2

Q2-1

Specify the basis for considering the incremental dose resulting from increased storage to result in noncompliance with 10 CFR Part 20.

RESPONSE

Answered together with SMP Response to Q2-2, below.

Q2-2

What do you consider to be the incremental dose from expanded storage? Present your calculations to support this dose figure.

RESPONSE

SMP does not consider the increased storage of spent nuclear fuel, per se, to result in noncompliance with 10 CFR Part 20, although there remain real, unanswered questions as to the obligations of Applicant to pursue, analyze and consider alternatives to reracking and pinpacking under the general concept of ALARA. SMP's concerns focus on the proposed methods of disassembling, reassembling and reracking spent fuel by Applicant under "normal" operating procedures. More specifically, SMP is concerned that — (1) The altered geometry of the fuel assemblies; (2) The constricted coolant pathways up through compacted assemblies with a resultant reduced tolerance of accidental blockage and localized boiling; (3) The pinpacking of damaged fuel pins from the rejected 1974 load; (4) The proposed "put-some/take-some" methodology of fresh assemblies back and forth through the fuel transfer tunnel as a means of mitigating unanticipated rises in bulk pool temperature; (5) The restriction of coolant flow throughout the bulk of the stored fuel in its reracked and compacted configuration; (6) The demonstrably accident-ridden history of operations at Maine Yankee, which includes knocking a worker overboard into the spent fuel pool, (which worker then spit 1000 dpm Co 58, amongst other identifiable poisons); and (7) The proposed extraction and insertion of some twenty-thousand-plus fuel pins per year through extremely narrow and stringent tolerances, and across a series of grid springs; —together with a constant shift in the geometric and reactive configuration of the spent fuel assemblies may lead to: (1) Increased neutron release

and exposure; (2) Increased release of radioactive gasses; (3) Increased dislodging of radio-cobalt crud together with sudden and sporadic increases in "pool shine"; and (4) More frequent loading of filters and/or demineralizer beds necessitating more frequent and presumably higher exposures. SMP is currently attempting to quantify exposures in the above categories while necessarily relying upon information forthcoming under the current discovery process. As SMP receives further information and as calculations are completed, SMP will forward such calculations to NRC Staff in a prompt and timely manner.

The primary obstacle to calculating exposures, which apparently did not catch the full attention of NRC personnel preparing Staff's Environmental Impact Appraisal and Safety Evaluation Report, but which SMP finds to be insurmountable until corrected, is Applicant's failure and/or refusal to furnish information as to just how Applicant proposes to extract and reinsert some 400,000 irradiated fuel pins, some leakers and some not, some possibly swollen, bent, or otherwise deformed or distorted, within a purpose of mitigating exposures and under a proper and responsible quality assurance program and controls.

In brief, it is SMP's contention not necessarily that a given exposure will result, but that reasonable assurance by the Applicant (and correspondingly or consequentially, the NRC) is lacking. At risk of tedious repetition, it would greatly benefit the conduct of these proceedings if Applicant informed the intervenors whether the spent fuel pins are to be handled with oyster-tongs, vise grip pliers, or some as yet unidentified instrument of Applicant's creation. Unless and until Applicant makes such disclosures, SMP will remain handicapped to the point of prohibition from performing the caluclations here requested.

Q2-3

What additional controls would you impose on the Licensee to assure compliance with 10 CFR Part 20? Identify the regulatory basis for such additional controls.

RESPONSE

No reasonable program of Quality Assurance can be maintained without some idea of the methods and implements proposed for any application involving the handling of highly radioactive materials. Given that one PWR fuel assembly of 176 pins at 150 days contains $5.25 \times 10^3$ curies of Krypton 85, it can be presumed that the rupture of a single pin will release something on the order of 290 curies of gas for almost immediate lung and whole-body exposure of insufficiently protected personnel. Unless some assurance regarding fuel handling is forthcoming, no assurance exists that 10 CFR Part 20 will be complied with.

Q2-4

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 2?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE:

SMP responds in conformity with its response to the prior interrogatory, which response SMP here incorporates by reference. Please see SMP Response to Interrogatory, Q1-3, a-f, set out above at 3-5.

INTERROGATORY 3

Q3-1

What type of accident(s) is the basis for SMP's Contention 3? Describe the accident sequences, and the aspects of spent fuel performance to which Contention 3 refers.

RESPONSE

SMP Contention 3 refers generally to any accident which affects the ability of the safety, cooling,and/or isolation devices, together with all other critical components of the spent fuel pool building, ("SFPB"), to perform their functions as they relate to public health and safety, (including the health and safety of the workers in the SFPB, reactor containment, fuel loading, handling and storage areas, spent fuel loading and handling areas, and radioactive waste handling, loading and storage areas). The functions of said safety, cooling,and/or isolation devices may specifically, but not exclusively, be adversely affected by blockage, thermal overload, mechanical failure, materials failure, operator failure (human error), improper or inadequate maintenance,

radiation, accidental change of configuration, loss of power, and the consequences of natural or man-made disasters. Components which are being studied by SMP include: fuel cladding, fuel assemblies (cages), fuel canisters, fuel transfer and handling mechanisms, piping and valves, pumps, filters, demineralizers, heat exchangers and shared or related systems such as the PCC and reactor pool. Also under consideration in this respect are monitoring and analysis systems, maintenance and operations procedures, and accident or emergency response plans. Under consideration but as yet for the most part under plausibility, but not probability, studies, are accident sequences involving:

(1) The rupture, dropping, and distortion of configuration with resultant loss of integrity and resultant discharge of radiation and/or radioactive material from freshly discharged spent fuel during the proposed "fuel transfer tunnel minuet", (i.e., Applicant's proposed "put-some/take-some" methodology), as described in the SER and EIA and Applicant's final submittal as a means of maintaining bulk spent fuel pool ("SFP") temperatures at or below 154° F.

(2) A meltdown and breach of containment, or steam-generator failure and breach of containment, or hot-side pipe rupture and inadvertent release, or a loss-of-cooling accident ("LOCA") and hydrogen-generation plus explosion leading to loss of containment integrity, or a major steamline break coupled with ramping of feedwater valves in the open position followed by loss of containment followed by loss of integrity of control systems and/or followed by loss of barrier integrity of the reactor or steam generators or primary coolant loops and/or the loss of barrier integrity of integral auxiliary systems or a severe fuel handling accident within the containment but with containment integrity compromised as with open fuel transfer tunnel locks, the failure to secure equipment doors, the loss of penetration seals, or the simple failure, as occurred at Applicant's facility in March of 1979, to line up filters. Almost any combination of the above, which would lead to high radiation levels at, in, or near the SFPB, and which would deny access to personnel for the purpose of undertaking emergency SFP cooling procedures, is presently under investigation by SMP. It should be noted here that to the knowledge of SMP, nowhere in the voluminous submittals of Applicant, and nowhere in the EIA or SER, does it state what conditions would be like or what controls would be initiated to prevent overflow of the SFP during the addition of make-up coolant water should SFP coolant circulating pumps fail as they likely would if they or their controls are not qualified to operate in a high-radiation, -temperature, -moisture environment or should a reactor accident be the result of the loss of both offsite and onsite power, cutting power to the coolant pumps also.

(3) Any accident involving the impact of tools, cranes, girders, crane components, fuel racks, fuel assemblies, discarded fuel racks or portions thereof, and fuel casks on stored fuel or in-transfer fuel or pins being removed from fuel assemblies or partially inserted in new assemblies, or fuel assemblies being inserted in or removed from fuel canisters — with weights, velocities, trajectories, and/or cumulative inertia as yet unanalyzed by Applicant, vendors, or NRC Staff. One scenario under active investigation by SMP involves the impact of various dropped weights with various shapes and points of impact or

contact with fuel pins, assemblies, racks, and canisters following the induction of some lateral momentum as a result of striking the edge of the SFP or some other obstacle during a drop. As soon as Applicant identifies what tools it plans to use, in what manner, and with what safeguards during its proposed pinpacking operation, SMP can better undertake at least that portion of its study involving the impact of various weights and shapes on individual fuel pins.

(4) Accidents during the cutting, removal, packing and storage of irradiated fuel assemblies and fuel rack discards.

(5) Accidents during service, replacement, or mainteance of filters and demineralizers.

(6) Accidents involving related systems which may affect the integrity of the SFP cooling systems, (E.g., PCC, scenario not yet completed).

The six foregoing considerations are not intended by SMP to preclude the assertion of others as may evolve through discovery or which may be included in the first part of this response.

Q3-2

What do you believe to be the effect of the expanded spent fuel capacity upon the consequences of any such accident(s)? Describe the consequences with respect to the type, location, property and/or people impacted.

RESPONSE

In general, densified and increased spent fuel storage (incorrectly stated as "capacity") is seen by SMP as potentially adding to both the magnitude and probability of the accidents described above. There is a potential increase in magnitude for drop and handling accidents because the proposed "new" assemblies would hold 285 pins as opposed to 176 pins in the present configuration. The overall bulk increase in the amount of fuel stored would add to the magnitude of an accident by: (1) Adding to the load on filters and demineralizers; (2) Impeding the flow of coolant to a damaged or blocked section of the entire load; (3) Restricting the access of workers to trouble spots, (damaged fuel, blocked coolant pathways, or failed cladding near the center of this denser load); (4) Requiring fairly tight tolerances, (E.g., 1/8th inch between assembly and canister which would impede emergency removal and therefore corrective action should any bowing or other distortion occur concurrent with cladding failure; (5) If one acknowledges the feasibility of a propagating exothermic reaction heat-up and resultant releases of radiation, including possibly the aerosoling of a good portion of the spent fuel pool inventory following a boil-off of coolant, (and SMP does acknowledge such possibility), then it follows that the more fuel is added to the fire, the greater the fire; otherwise stated, if a release occurs under the foregoing circumstances, it will likely be increased because of the increased amount of spent fuel in the SFP.

As acknowledged above, SMP also contends that the probability of accidents increases in proportion to (1) The increased load on all systems, and (2) The increased handling and shuffling of spent fuel and irradiated components required by the proposed scheme. Otherwise

stated in terms of plain statistical recognition, the more complex and demanding any system becomes, then the greater the probability of error. Relative to this part of this Contention and Response, SMP is especially handicapped by Applicant's failure or refusal to identify, specifically and in detail, the means and methods to be followed in the pinpacking aspect of its d/r/c scheme.

Additional information on various accident scenarios and accident consequences may be found in SMP's Responses under Q2-3 and Q3-1, (E.g., typical effects on workers are described under Q2-3 as the exposure to released radioactive gasses and increased shine from the SFP).

Effects on the public at large depend on the ability of the SFPB to contain any releases. Until Applicant is more forthcoming in response to SMP interrogatories about the integrity of the SFPB, it is impossible to calculate the effects of such an accident upon the public. At this point SMP can only say that such accident would be worse than a similar accident with a less dense assembly. Should the Board allow Applicant its requested protective order in this subject area, SMP will be burdened to base its calculations on an open-air, unrestrained release for, by way of example, one full assembly, (285 pins), at 180 days. A similar interference with SMP's ability to perform realistic dose and contamination assessments exists for all other scenarios described except for Q3-2, part e, which describes what is popularly called "the Japan Syndrome", fire in the spent fuel pool, in which case we can presume failure of the SFPB barrier itself, and within such scenario SMP would find itself burdened to follow the lead of a number of federal reports and pursue a very approximate estimate as to how many millions of curies of what substances would be released.

It should also be noted here that the entire region surrounding Applicant's facility, and the Boothbay Harbor Region in particular, are heavily dependent on the tourist industry, with a closely secondary position taken by the seafood industry. Any significant release into or contamination of local waters and/or seafood, including mollusks, would have a disproportionately severe effect on the region's economy. SMP views seriously any adverse impact on the region's economy as it is reflected directly in the physical well-being of the region's inhabitants. For example, according to recent statistics from Maine's Department of Human Services, children of low-income families in Maine die at a rate of six to eight times higher than that of children from families with median or above income.

In addition it should be stated that, in two separate initiatives in 1980 and by a higher margin in 1982, the residents of the counties surrounding Applicant's facility voted in favor of its closing, which reflects their deep concern about the safety of its continued operation and the possibility of an accident. A certain amount of local concern focuses on the continued storage of high-level radioactive waste at the site. SMP considers, and will ask this Board to consider, the psychological and indirect economic consequences of any accident at Applicant's SFP which results in a higher than usual dose to the public or which results in any lasting impact upon the regional fisheries, including shellfish.

Q3-3

What aspects of accidents within the spent fuel pool have not been "analyzed sufficiently" in the Staff's Safety Evaluation?

RESPONSE

SMP has under study the accident scenarios described above. It is SMP's view that both the SER and EIA have failed to take into consideration all credible events which could reasonably be expected to lead to an accident, both those described in the responses above and those which remain unknown due to Applicant's failure and/or refusal to answer and request for protective orders regarding the exact means of the proposed pinpacking, fuel handling experience, fuel condition, the environmental integrity of the SFPB, and several other central questions. (Please see Applicant's Responses to SMP's first two sets of interrogatories.) Also adding to the difficulty of responding to this question is the failure or refusal of NRC Staff to provide responses to SMP's informal inquiries[4] which, amongst other subject areas, have attempted to ascertain the means NRC Staff used to verify the assertions regarding safety, environmental impact, and accident analyses in Applicant's Final ("complete") Report of October 5, 1981. Please also see SMP's attachments to its additional or supplementary contentions, the "Comments" on the SER and EIA, which identify and discuss a number of deficiencies in the SER and EIA.

Q3-4

Has SMP performed any of the analyses referred to in Q3-3 above? If so, what were the results of such analyses?

RESPONSE

SMP is gathering data for, but has not completed, analyses, due in part to a lack of information from NRC Staff and Applicant.

Q3-5

Demonstrate that the analyses referred to in Q3-3 and Q3-4 above are not within the bounds of analyses (of) the Staff's review.

RESPONSE

(a) Not all probable trajectories for dropped objects have been analyzed by Staff or Applicant, and pinpacking has yet to be described anywhere and therefore accidents resulting from pinpacking operations cannot be analyzed;

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[4]SMP has to date presented at least two sets of informal discovery to NRC Staff: The first was served upon Staff Counsel Henry J. McGurren on August 11, 1981; the second was hand-delivered to the office of Staff Counsel Richard J. Goddard on March 31, 1983; third, in mid-1982, SMP sent informal discovery to Applicant, with copies to Staff Counsel Jay M. Gutierrez, requesting his assistance (per telephone conversation). All such informal discovery was avoided or unsatisfied.

(b) Inadvertent blockage of coolant flow through the stored fuel assemblies has not been analyzed;

(c) The effects of damage to related systems such as the SFP/PCC heat exchanger have not been analyzed;

(d) The Applicant's record of experience in spent fuel handling to determined success at pinpacking operations has not been noted or analyzed.

Further, its is SMP's view, to be demonstrated dependent upon information forthcoming from the Applicant, that failure to adhere to Quality Assurance standards could have a negative impact on safety, potentially leading to one or more of the scenarios described above. Nowhere in the Applicant's submittals or in the Staff's EIA or SER do there appear plans for emergency procedures or training for emergency procedures to handle even those possible accident scenarios analyzed by Applicant and confirmed by NRC Staff.

Q3-6

Explain in detail in what respects the accident consequences analyses are not "sufficient".

RESPONSE

Accident analyses by NRC Staff and Applicant do not take into consideration accidents during pinpacking, and provide only cursory analyses of the other scenarios listed above. Such analyses do not take into account any quantification of permeability of the SFPB , and they fail to consider the consequences of human error or describe in detail training programs and operational procedure designed to preclude human error. SMP is currently investigating accident precursors, accident scenarios following various precursors, their likelihood, credibility, and effects in addition to those described throughout SMP's Responses upon Contention 3 as well as those described in previous submittals by SMP, but not included in the Staff's analyses, or included but with, in the view of SMP, insufficient verification. As yet these investigations are incomplete; however, it is likely that some portion of them will be completed to a degree sufficient for presentation to the Staff before or immediately following the period of discovery.

Q3-7

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 3?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witness on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, a-f, set out above at 3-5.

INTERROGATORY 4

Q4-1

Is it possible to preclude boiling by any particular spent fuel rack design? If so, please describe such design and the difference between such design and applicant's proposed rack design.

RESPONSE

SMP objects to this interrogatory and seeks a protective order with respect thereto on the grounds of immateriality, irrelevancy and procedural impropriety. Speculation upon the general parameters of a hypothetically acceptable spent fuel pool is not likely to lead to the discovery or development of material or relevant information. The issue here is not whether there may or may not be some other fuel rod consolidation design which might preclude boiling — but rather whether or not Applicant has demonstrated that the design it has proposed will definitely preclude localized boiling. Further, insofar as this interrogatory appears to suggest that there may be a burden on SMP to "find a better way" the interrogatory is thoroughly objectionable since any such suggestion unlawfully and invalidly shifts the burden of proof, which is upon Applicant, and misstates the nature and purpose of these proceedings, which is that Applicant demonstrate and the Staff ensure that public health and safety, and environmental interests, will be adequately protected. Last by way of introduction, and without waiving any of the objections noted, SMP responds to this interrogatory as more particularly set forth below.

SMP believes that it is possible to preclude localized boiling with a greater degree of assurance: (a) By enlarging the plenum beneath the

be the undesirable consequences of such boiling.

RESPONSE

The undesirable consequences that are under active study at this time include: (a) The separation of radio-cobalt crud from the surface of the fuel pins and assembly components adding to the pool "shine" and increased filter and demineralizer loads; (b) The bowing or failure of canister walls which have not been properly vented or which have plugged vent holes. Possibly attendent to this would be the displacement of boral/poison shielding; (c) Cladding degradation and possibly exothermic reaction and cladding failure; (d) An increase in Keff beyond .95; (e) The possible rupture of one or more fuel pins, possibly as a result of increasing fuel pin plenum pressure beyond pin design; and (f) An increase in the amount of radioactive material surrendered to the SFP and to the atmosphere by leakers.

It should be noted here that SMP is currently at work accumulating and analyzing evidence regarding the above concerns and has not yet finalized the boiling consequences scenarios according to (a) Priority, (b) Credibility, (c) Probability, and (d) Ultimate effect on the human environment. Further, the above represents a list of consequences only as complete as SMP can make it at this time and should not be taken to represent all of SMP's concerns as may be brought forward in written evidence or at hearing. Last, SMP here joins and incorporates by reference the response of the State of Maine to this interrogatory.

Q4-4

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 4, State 2?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

INTERROGATORY 5

Q5-1

Describe the scenario(s) which may result in failure of materials in the proposed racks. Describe the conditions which will be present in the pool which would exist during such scenario(s).

RESPONSE

SMP has not, to date, focused its concerns on the failure of the materials in the proposed racks other than to look at the possibility of accelerated galvanic action due to increased heat and reduced spacing, and to look at the possibility of materials degradation and possible failure in the proposed spent fuel canisters as would be accelerated by elevated temperatures and the effects of localized boiling. (Please see SMP response to Q4-3.)

SMP notes that under the proposed scheme several varieties of metal and metal alloys will be manipulated and stored over a period of twenty years in a warm aqueous solution ranging in ph from 4.5 to 8.5. (Please see Response to SMP Interrogatory 4(i), (Brinler), Applicant's Answers to SMP's Second Set of Interrogatories.) Presumed to be in suspension and/or solution in the SFP coolant are also as yet unidentified amounts of salts, metallic elements and compounds, gasses, halogens, and other substances which in addition to possible corrosive effects, could over the period and at the temperatures anticipated result in the deposition of scale and other surface deposits on the fuel cladding, fuel assembly components, canisters, and racks. Such deposits could interfere with: (a) Heat transfer; (b) Coolant flow; (c) Easy removal of fuel pins, fuel assemblies, and canisters; and (d) Build-up in interstices/gaps throughout the storage components and stored fuel in such a way as to exert annular pressure on fuel pin cladding and/or canister walls.

It is SMP's view that materials degradation and failure would be accelerated by conditions of localized boiling and inadvertent criticality in the spent fuel pool. It should be presumed in considering this question that materials failure, as a concern of SMP, need not and should not be isolated under "normal" operating conditions but should also be considered under extraordinary conditions such as loss of coolant, heavy-load drop, earthquake, operator (human) error, and so on.

Q5-2

Describe the scenario(s) by which such alleged failure(s) of materials will impact upon public health and safety. Describe the consequences with respect to the type, location, property and/or people impacted.

RESPONSE

Materials failure and/or degradation does not in and of itself impact upon public health and safety. Materials failure and/or degradation is of concern because at any point in a chain of events the performance of a given material can make a critical difference as to where, when or how the chain stops or breaks or what the next link is. Simply put, materials failure and/or degradation would in probability play a part in the accident scenarios and other undesirable effects referenced above in SMP's Responses to NRC Staff Interrogatories 1 through 4. SMP has not finalized analyses of all accident scenarios involving or resulting from materials failure and/or degradation. As soon as sufficient information is forthcoming from Staff and Applicant, such analyses will be completed and served upon all parties in a timely manner.

Q5-3

Provide copies of reports documenting actual measurements showing swelling, bowing, or other forms of distortion in the spent fuel pool materials after exposure to temperatures and radiation fluences similar to that in the Maine Yankee spent fuel pool.

RESPONSE

Please see Response to Q5-4 immediately below.

Q5-4

Provide copies of reports or studies that address the probability of swelling, bowing or other forms of distortion in the spent fuel pool materials after exposure to temperature and radiation fluences similar to that in the Maine Yankee spent fuel pool.

RESPONSE

By way of response to these two interrogatories, SMP respectfully directs the attention of our Board to a number of points, specifically:

First, despite continuing efforts by SMP over the past two or more years, some of which efforts are noted in footnote 4 on page 11, supra, and despite the continuing duties upon them to disclose and inform as to all relevant and appropriate information, neither the Applicant nor the NRC Staff has furnished directly to this proceeding any of the information comprehended by this interrogatory.

Second, this information already exists, and exists within the possession and control of both Applicant and NRC Staff. More particularly, SMP has recently been made aware of "Licensee Event Report, Reportable Occurrence No. 82-033/01X-2", prepared by Applicant and transmitted to the NRC under date of January 21, 1983, which report expressly recognized "bulging" in 10% of the fuel storage cells now in use in Maine Yankee's spent fuel pool.

Third, we are here referring not to a situation "similar to that in the Maine Yankee spent fuel pool, this is Maine Yankee's spent fuel pool itself, now, and even without increased storage.

Fourth, the law is quite clear that any attorney representing a party is charged with at least the constructive possession of knowledge or information possessed by or under the control of that party. Thus, while NRC Staff Counsel here propounds an interrogatory to SMP inquiring upon the existence of reports on "swelling", "bulging", and the like, at least one such report currently exists within the immediate possession of Counsel's[5] own client/employer/agency.

Fifth, and in corollary to the foregoing, it should and can now be asked how many more and/or what other similar documents remain unidentified or undisclosed within the files of both Staff and Applicant.

Q5-5

Provide a copy of an analysis showing that the tolerances in the fabricated spent fuel racks and crates will preclude manipulation during underwater operations.

RESPONSE

This question does not appear to be pertinent to SMP Contention 5. The focus of such contention is essentially that Applicant must demonstrate and the NRC Staff must verify that public health and safety will not be endangered because of any materials failure or degradation problems. Last, and as necessary hereto, SMP requests a protective order in support of such objection.

Q5-6

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 5?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions, or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

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[5]Neither SMP nor its counsel intend any disrespect to NRC Staff or NRC; rather this objection is that, at least in this case, both Staff and Applicant have "sat upon" information which they should more properly have shared with this Board and with intervenors.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

Except for the "licensee Event Report" cited above, SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

INTERROGATORY 6

Q6-1

Identify the specific deficiencies of the modified spent fuel pool which lead you to conclude that they will not comply with the Seismic Category 1 design criteria for MYAPS. Explain your answer in detail for each specific deficiency.

RESPONSE

SMP is currently cross-checking calculations performed by Applicant in accordance with concerns expressed in SMP's attachments to its Additional or Supplementary Contentions, specifically the appendix of "Comments". SMP has not yet completed its own calculations in this area and is therefore not ready to comment on specific deficiencies of the modified spent fuel pool, (sic., LOAD), at this time. SMP hereby notes that with respect to Category I Criteria that NRC together with the Applicant are currently investigating the necessity of altering seismic criteria for MYAPS due to increased seismic activity in the MYAPS area. Included in those investigations is a review of geologic features immediately surrounding the plant site and, SMP presumes, running beneath the plant and the spent fuel pool. SMP's original contention upon this subject area included these considerations before the Board rewrote such contention. SMP here urges that the NRC Staff exercise its power of advocacy in the interest of public safety to recommend to the Board that SMP's contention in its original form be reinstated. In further support of the same, SMP directs the attention of all parties to the fact that the Commission is right now continuing a re-evaluation of seismic criteria.

Q6-2

Identify the specific deficiencies of the proposed racks which lead you to conclude that they will not comply with the Seismic Category I design criteria for MYAPS. Explain your answer in detail for each specific deficiency identified.

RESPONSE

It is not SMP's view at this point that the proposed racks will themselves be deficient in regard to Seismic I criteria; however, this response should not be taken to mean that as new information comes forward and as overall analysis proceeds the suitability of the racks themselves will not be brought into question. Additionally, SMP joins and here incorporates by reference the Response of the State of Maine to this interrogatory.

Q6-3

Identify the portions of 10 C.F.R. with which the pool structure (as modified) will not comply.

RESPONSE

SMP is not aware of any modifications existing or planned to the pool structure, and respectfully requests an explanation or clarification of this question. Q6-4 (following) isolates the proposed racks which together with the fuel "cages" are the only "structures" which, to SMP's knowledge, Applicant proposes to modify. If Staff intends to mean pool structure with proposed modifications to stored fuel and racks in place, SMP has to date relied on the Class I seismic criteria as outlined in Section 5.1.1.2.2 of the MYAPS Final Safety Analysis Report under general Class I structure design; also NRC Regulatory Guides 1.13 and 1.29; also requirements under 10 C.F.R. Part 50 and/or 10 C.F.R. Part 100 as referenced in Sections 4.7.0 and 4.7.1 of Apllicant's "Complete" Report of October 5, 1981.

Q6-4

Identify the portions of 10 C. F. R. with which the proposed racks will not comply.

RESPONSE

Please see Responses to Q6-2 and Q6-3, above.

Q6-5

As to Q6-3 and Q6-4 above, state the exact nature of each alleged noncompliance, and the consequences which you believe will result.

RESPONSE

SMP has not finalized its position with regard to specific items of noncompliance.

Q6-6

Applicant's analysis of a potential fuel bundle drop indicate(s) that no unacceptable damage to the pool or the racks will occur. Identify the inadequacies in their analysis, and furnish the results of any analysis you have made which reaches a contrary conclusion.

RESPONSE

First SMP respectfully notes some confusion on its part as to what an interrogatory on fuel bundle drop is doing in a section treating seismic criteria.

Second, SMP joins and here incorporates by reference, that part of the Response by the State of Maine objecting to the presumption of "no unacceptable damage" as asserted by Applicant.

Third, SMP has not completed cross-checking Applicant's analysis regarding potential damage to pool and pool contents from heavy and not-so-heavy dropped loads. However it is a concern (relative to dropped fuel bundles) that analysis by Applicant appears to presume initial impact of a dropped fuel bundle to be end-on, which is reasonably conservative given the angle at which they are normally handled and the greater penetrating or shearing impact of the end as opposed to the side. What appears to be left out is: (a) Analysis of the effect on the pool bottom if the fuel bundle falls on tools which the Applicant stores in the pool, said tools providing a "point" for the fuel bundle; and (b) The effect on pool sides or on racks struck form the side if the dropped fuel bundle strikes only a light glancing blow on an obstacle (such as a fuel rack edge) on its way down.

Fourth and last, SMP incorporates by reference, and as applicable here, its answers to NRC Staff Interrogatory 7 below.

Q6-7

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 6; State 5?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), published (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

INTERROGATORY 7

Q7-1

Identify the alleged deficiencies in Applicant's analysis of a fuel assembly or fuel cask drop accident. If such accidents were to occur, how would consequences be increased under the d/r/c proposal?

RESPONSE

Applicant has failed to identify all trajectories and targets. Applicant has not analyzed the effects of such drops on fuel pins or fuel cladding. Applicant's analyses therefore do not extend to releases and public health and safety impact, if any, from ruptured pins. Following, Applicant fails to analyze doses offsite, if any, including permeability or environmental integrity of the SFPB. Applicant does not analyze potential for criticality with crushed fuel.

The d/r/c scheme results in increased weights being handled — hence more impact. It requires more handling, increasing the likelihood of an accident. If fuel is the target in a drop accident, more fuel is likely to be damaged in compacted or pin assemblies by a factor of roughly .64. As it is understood by SMP, the d/r/c scheme will require more personnel to be present in the SFP area, for more time, making it likely that if a dropped load results in a release, then more workers will be injured.

Last, and where not inconsistent with the foregoing, SMP joins and incorporates by reference the response of the State of Maine to this interrogatory.

Q7-2

Discuss the heat generation rates and radioactive inventories of the spent fuel bundles under the d/r/c proposal. What do you believe to be the increase in heat generation and radioactive inventory over presently allowable limits?

RESPONSE

SMP believes the increase in heat generation and radioactive inventory in fuel bundles under the d/r/c scheme to be roughly in proportion to the increase in the number of pins in each assembly, 285/176, with the caveat that some increased heat and possibly some change in radioactive inventory is to be expected from interaction between the more closely spaced pins. SMP has not completed bulk heat and radioactive inventory calculations for the entire pool load, however SMP is basing its calculations on the presumed decay heat output of approximately 1100 k/w per 176 pin assembly at discharge; 6.2 kw at 1 year; 3.2 kw at 2 years; 1 kw at 5 years; and 0.6 kw at 10 years.

Radioactive inventory for a 176 pin assembly at 150 days is benchmarked against the following radionuclides: Cobalt 58 — $1.09 \times 10^3$ Curies; Cobalt 60 — $5.17 \times 10^{11}$ Curies; Krypton 85 — $5.25 \times 10^3$ Curies; Cesium 134 — $1.2 \times 10^5$ Curies; Cesium 136 — $1.1 \times 10^1$ Curies; Cesium 137 — $5.32 \times 10^4$ Curies; Plutonium 239 — $1.55 \times 10^2$ Curies; and Plutonium 241 — $5.18 \times 10^4$ Curies.

Relative to "heat generation and radioactive inventory over presently allowable limits", SMP is not entirely informed as to what is meant in this question by "allowable limits of heat and radioactivity". Upon clarification of the same, SMP will attempt to provide whatever relevant information is here being pursued.

Last, and as recognized in the response of the State of Maine to this interrogatory, Applicant has not yet furnished adequate information for intervenors to perform a full analysis in this subject area. When such information is provided, SMP will pursue this analysis further.

Q7-3

What consequences would result from a deflected assembly/cask falling into the pool which would exceed the bounds of Applicant's and Staff's existing analyses. Describe the accident sequences you are considering.

RESPONSE

Most spent fuel components are strongest, insofar as resisting the impact of a dropped load, in their vertical members (compression strength). A deflected load would (in a pool with a parial fuel load) strike vertical members (rack uprights, canisters, fuel assemblies) from the side, inflicting stresses not calculated in NRC or Applicant analyses. Even with a full pool load, assuming a deflected load strikes across the top of the racks and canisters, the "racking" strenth of all components would be tested. Lateral momentum would be induced in racks and canisters to test the strength of components somewhat removed from the point of impact. In a similar mode, a dropped load deflected from a rack and striking the side of the spent fuel pool at a fairly acute angle could possibly tear the stainless steel liner which would have varied effects depending on where it was done, how large a gash were made, and how large a fuel load was in place at the time. Possible consequences might be: overflow of the sumps with radio-contaminated water; additional and unnecessary worker exposure during repairs; and damage to coolant inlets or outlets.

Accident sequences requested under Q7-3 are anticipated in SMP's Response to Q7-1, and in responses to previous questions in this set of interrogatories requesting suggested accident scenarios.

SMP has not completed load drop and consequence analyses for all possible scenarios introduced by SMP and not considered by Staff or Applicant. At this stage of the proceeding SMP is uncertain whether it is its duty as an intervenor to provide these analyses, or simply demonstrate that certain scenarios involving load drop are credible, as yet unconsidered by Staff or Applicant, and would result in consequences serious enough (though not quantified) to require analysis before a license amendment is granted. SMP is inclined toward the latter view, and recommends it to our Board's attention.

Last, SMP joins and incorporates by reference, insofar as applicable, the Response of the State of Maine to this interrogatory, especially such part of said Response as recognizes Applicant's failure or refusal to answer "Question 20".

Q7-4

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 7; State 3?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during the proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

INTERROGATORY 8

Q8-1

What scenario(s) are you postulating which might lead to a criticality excursion in the spent fuel pool? Explain your answer in detail.

RESPONSE

SMP postulates criticality excursions upon: (a) Accidental change of configuration of an as yet uncalculated amount of spent fuel either

through accident or human error; or (b) Under conditions of localized boiling which alter fuel configuration or interfere with appropriate moderation, including but not limited to: moderation changes through voids, vapor, steam at various temperatures, bubbles, vapor and water mix with the addition of various released materials from ruptured fuel pins; moderation change through corrosion salts and other unanticipated deposits on fuel, cages and canisters; and under conditions of possibly incorrectly calculated Keff by either Staff or Applicant involving properties of Plutonium which vary from those of Uranium. With regard to criticality excursions, SMP is particularly concerned with the disposition of those 200-plus assemblies discharged because of defects in 1974 with an average burn-up of only 10,000 Mwtd, as SMP understands it, not "spent" fuel. SMP does not find, in the Applicant's submittals regarding criticality, any reference to this low-burn-up fuel, nor does SMP find any calculations regarding its interaction in the d/r/c scheme. SMP has requested but not received information regarding the present location, condition, and ultimate planned disposition of that core from the Applicant. SMP is attempting, under such handicap, to perform some elementary calculations of Keff for various mixes of standard and low-burn-up fuel in the proposed dense-pack scheme. SMP has not determined the exact aspects, from among the many possible, upon which it will rely as proceedings progress.

Last, SMP joins and incorporates by reference the response of the State of Maine to this interrogatory insofar as such response recognizes the as yet unsatisfied duty of Applicant to perform the analyses and furnish the information noted.

Q8-2

Why do you believe that such a criticality excursion would result in a major release of radiation and radioactivity? Describe the scenario(s) which might produce such consequences.

RESPONSE

As SMP understands it, a criticality excursion would likely involve a sudden release of energy, probable displacement of some fuel possibly leading to propagation of the reaction to an extent as yet unestimated. SMP has not quantified what constitutes a "major" release but for purposes of this proceeding is inclined to draw the line at any release which poses health risks in excess of regulatory limits to workers or the rest of the public, or which finds its way into the food-chain to accumulate, demonstrably, at any point in the food-chain in excess of regulatory limits. SMP has not analyzed all possible scenarios which could lead to criticality excursions and major releases to the point that it has finalized which scenarios it will rely on throughout these proceedings. In addition to the scenarios listed above, SMP is studying the possible effects of any change or alteration in neutron moderation in the event of partial loss of coolant, in which case it is postulated that neutron multiplication could concievably occur, resulting in energy production, if not excursion, when neutrons and high cross section fission products act more energetically in high temperature and/or steam voids, passing through boral plates into neighboring assemblies.

As to public exposure pathways, some have already been discussed in previous responses to this set of interrogatories. SMP is concerned the the SFP is housed in an ordinary sheet-metal building with no known provisions to contain a hydrogen or steam generated pressure spike. Further SMP questions whether or not in the event of a power excursion sufficient energy might be produced to expel a fuel assembly or a portion thereof, violating the environmental integrity of the SFPB and leading to a direct unfiltered release.

As stated in response to Q7-3, SMP questions whether its responsibility in this proceeding is to completely analyze all possible scenarios, or more simply demonstrate the letter of its contention, "that the Applicant has not demonstrated" that all credible scenarios will not occur.

Insofar as the response of the State of Maine to this interrogatory recognizes the inadequacy of information thus far furnished by Applicant, SMP joins and incorporates by reference that response.

Q8-3

Are the scenario(s) referred to in Q8-1 and Q8-2, above, equally likely to result in a criticality excursion in the spent fuel pool as it is presently designed?

RESPONSE

No.

Q8-4

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 8; State 1?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceeding.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogagtory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC

documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

INTERROGATORY 9

Q9-1

What specific qualifications do you believe an applicant must possess to manage the proposed operations in a manner which protects the public health and safety? Identify each of your proposed specific qualifications against NRC regulatory requirements.

RESPONSE

It is SMP's belief that the proposed d/r/c scheme exceeds the bounds of purpose, practice, technique, responsibility and intent which would permit its realization as a simple amendment to a power plant operating license.

Prior to the granting of MYAPS operating license by the AEC in 1972, the AEC held a series of public hearings involving the well-advertized solicitation of participation by area residents. The purpose of MYAPS was clearly and expressly stated as the generation of electricity. MYAPS was qualified at that time by the AEC with the tacit consent of area residents to operate its spent fuel pool as a minor adjunct to its primary function of operating a power reactor. Spent fuel was to be stored on site only long enough to allow it to cool, both thermally and radiologically, to a point where it could be shipped. What MYAPS proposes to do now departs radically from the concept of simply burning and "temporarily" storing nuclear fuel. MYAPS now proposes more or less continuous SFP and SFPB operations handling minor fuel components (pins), a far more demanding, exacting and risk-ridden task than was ever envisioned in the initial license proceedings. The d/r/c scheme involves the design and first-time use of tools and procedures which on the scale proposed can only be termed experimental, and in fact incorporate a procedure at this scale once identified as the first step in nuclear fuel reprocessing.

The Applicant also proposes storing fuel far beyond the date for final waste repositories identified by the Nuclear Waste Policy Act of 1982, to no apparent purpose, casting in doubt the necessity of the proposed license amendment. Further, SMP is concerned that granting the amendment will (barring accidents or unsalutary side-effects) provide Applicant essentially "life-time" storage, and given that Applicant is a single asset company now apparently undergoing certain financial difficulties, assurance of its continued financial responsibility for the duration and beyond is significantly diminished. In fact, SMP is

concerned that the "amendment", if granted, removes the last shred of incentive for MYAPC to pursue to a proper conclusion its responsibility for ultimate disposal.[5]

MYAPS' history of fuel handling, while apparently regarded by some in the industry as good, is not sufficient in the view of SMP when contrasted to the levels of professionalism, care, innovativeness and consistency of performance required by Applicant's proposed d/r/c scheme. Negative indicators in recent years include: (1) Premature certification of operator candidates for NRC exams; (2) The hiring of unqualified or marginally qualified personnel by contractors to MYAPC; (3) Bending fuel in the upender; (4) Mismatching the location of spent fuel with the records of its location; (5) Inserting spent fuel only partially into the fuel racks and rotating the mast on the spent fuel loader; (6) Security violations; (7) Possibly supplying defective radiation gear to a worker in the steam generator (under litigation); (8) Failure to line up filters following a 2,000 gallon spill of primary coolant in the containment; (9) Operating with drawers of instrumentation wired in series; (10) Unexplained flashes of Iodine 131 in seaweed (to 600 picocuries/kilogram) near the plant; (11) Failure to maintain accelerographs in working order; (12) Failure to maintain the plant's own emergency siren in working order; (13) An incident of sabotage; (14) Allowing a high school youth on the grounds access to a valve releasing radioactive materials; (15) Sending waste containers out from the plant with surface readings in excess of radiation protection standards; (16) A series of repeated automatic shutdowns, and start-ups prior to ascertaining the cause of the reactor trip. This is only a partial list of the negative indicators SMP deems worthy of further investigation in determining Applicant's qualifications, including overall management capability, supervisory capability, quality assurance capability, and overall competence and responsibility. In addition it must be noted that no one at Maine Yankee has had any extensive training in handling spent fuel under conditions included in the proposed d/r/c scheme. It is SMP's view that trial-and-error research should be carried out at a federal test facility on a scale reasonably approximating that proposed in the application before it is attempted at a plant which has recently experienced unanticipated pump, piping and valve failures in systems no older than the cooling, handling, and safety systems in the SFP and SFPB. It is further SMP's view that personnel technically qualified to pursue the proposed d/r/c scheme would have included some assessment of wear and tear (and the likelihood of failure) of those systems in their "complete" report, but one reads Applicant's "Complete" Report of October 5, 1981, without finding this issue addressed.

The foregoing summarizes SMP's basis, at least in part, for its concern that MYAPS is not qualified to carry out the proposed d/r/c scheme in a manner that adequately assures protection of the public health and safety.

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[5] SMP does not intend any of the foregoing to accord any propriety or validity to Applicant's request for "life-time" storage. In fact, SMP anticipates filing a motion for review of such "life-time" aspect as beyond the jurisdiction of this Board to entertain or grant.

Because the Applicant has not been forthcoming regarding previous related plant experience, or the exact means and methodology by which it will pursue the d/r/c scheme, SMP cannot ascertain a full list of the qualifications which SMP believes the Applicant must have. The complete list of qualifications perforce going unnamed, SMP is obviously restrained from naming the appropriate portions of the federal regulations which pertain to each qualification. It should also be noted here that Applicant has refused intervenors permission to tour the plant during recent refueling and fuel handling operations, asserting that SMP representatives were technically unqualified. Among those refused whom SMP selected for said tour were the rough-draft-preparer of this set of Responses (SMP Technical Advisor), and Dr. Marvin Resnikoff, whose qualifications are included in the "Appendix", and who has served as an expert witness in NRC compaction proceedings. SMP here makes apology for the indirect response to Q9-1, but trusts that NRC Staff will understand that it is in major part due to the foregoing reasons.

Q9-2

Why does a "narrow tolerance" prevent storing pins in the proposed configuration? Cite specific prior events to support this assertion.

RESPONSE

SMP means "prevent", for the most part, in the sense that such storage is prevented in consideration of possible cladding damage, worker exposure from liberated Cobalt 60/58 crud, and considerations of providing adequate coolant flow between pins under adverse conditions such as scaling, crud build-up, corrosion, foreign material in the coolant, and so forth, as described in responses above. There remains the question as to whether or not pins that are bent, bowed, swollen, cracked or distorted can actually be physically threaded through the sets of spacers, grids and between similar fuel pins given the space and/or tolerances required under Applicant's proposed d/r/c scheme. At this point in the proceeding, in part because of the innovative nature of the proposal and in part because of the reluctance of the Applicant to divulge pertinent information, SMP knwos of no specific prior events to be cited in support.

Q9-3

Explain how fuel pins or other components would become deformed so as to preclude safe storage in the proposed configuration.

RESPONSE

MYAPS has had at least two experiences of whole fuel assemblies becoming bent and/or twisted through human operator error and the absence of common sense interlocks. (Please see Response, Q9-1.) SMP is also advised that under certain circumstances fuel becomes swollen or distorted within the reactor. Applicant has asked for and received Proprietary Protection of a fuel inspection report possibly dealing with just such anomalies at MYAPS.

Q9-4

What is your basis to believe that the proposed pin compaction

process would create an additional risk to the public health and safety?

RESPONSE

Pins are more delicate than fuel assemblies and significantly more vulnerable to external trauma, especially defective or distorted pins. Given that MYAPS has damaged whole fuel bundles, SMP submits that there is an even greater likelihood of damage to fuel pins. Further, pin-packing as proposed provides for denser storage, meaning the likelihood that more pins will be impacted in an accident or be affected by adverse localized conditions such as boiling. Also, please see the responses to similar questions above.

Q9-5

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Centention SMP 9?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

INTERROGATORY 10

Q10-1

Identify significant impacts upon the human environment arising

from the proposed action. Quantify.

RESPONSE

Preliminarily, SMP joins and here incorporates by reference the Response of the State of Maine to this interrogatory, especially such portion as recognizes the failure or refusal of Staff and Applicant to furnish adequate information. Thus significant impacts upon the environment are not as yet determined by SMP due in large part to the nondisclosure of the means and methods of Applicant's proposed scheme as well as the demonstrated reluctance of Applicant to share requisite information from past operating experience.

SMP is concerned that until the means and methods of the proposal under consideration are identified, accident scenarios together with effects approach the infinite rather than the finite or micro-finite scale. Further conservatisms require the consideration of an accident as a certainty rather than a probability. Effects of a fuel handling accident on the human environment can hardly be deemed insignificant. For example, a March 18, 1977, letter from J. L. French of MYAPS to the Office of Nuclear Reactor Regulation, NRC, regarding limited fuel handling accidents within the containment, asserts that dose assessments of such postulated accidents "lead to the conclusion reached in the Final Safety Analysis Report, i. e., that the limiting refueling accident occurs in the fuel building, not in the containment." The letter further states that dose to the thyroid at site boundary is 170 rem and whole body dose is 4 rem in the postulated accident. SMP deems this to be a significant impact on the human environment, especially if such doses arise from the certainty, not the probability, of an accident. At this point the accident becomes not an extraordinary event, but rather part of the "normal" operation of the plant. The frequency of such events can only be guessed at for the reasons stated above and for the reasons included in the responses to similar questions seeking quantification throughout this set of interrogatories. It is the Applicant's duty to furnish sufficient information upon the means and methods to be used in its proposed d/r/c scheme to demonstrate and prove that such releases will not occur. The Applicant's failure to do so is acknowledged in Section 2.7, Paragraph 2.7.1, of the SER as follows: "To allow flexibility in the modification plan, the licensee is not specific in the manner in which the modification sequence will be performed." Id., at 18. SMP submits that this scarcity or nonexistence of information is evidence of the experimental and unprecedented nature of the proposal, which of itself should require an EIS.

Further hampering SMP's assessment of the EIA and final determination of the basis upon which SMP will rely in seeking an EIS is the NRC Staff's demonstrated unwillingness to provide, on an informal basis, information concerning the development and verification of the assumptions, content, and conclusions of the EIA and SER. SMP is burdened to resubmit its inquiries as formal interrogatories through the Board.

To the knowledge of SMP, the proposed amendment constitutes the most ambitious single pool plant-site waste fuel project in the United States when the following considerations are taken together: (1) Gross

tonnage; (2) Density; (3) Open-ended duration of storage; (4) Possible (probable) preclusion of intact spent fuel removal; (5) Depletion of engineering conservatism in pool and auxiliary components; (6) The intensity and ongoing nature of spent fuel handling operations, including the d/r/c scheme; (7) The amount of damaged and defective fuel involved; (7) The reduction or preclusion of inspection and maintenance access resulting from the proposed cramped utilization of bulk pool space; (8) The experimental nature of the proposed scheme; (9) Reduced safety parameters and increased consequences of accidents involving operations in the cask lay-down area; (10) The generation of irradiated waste (discarded fuel assembly components; (11) The tenuous nature of the proposed means of mitigating spikes in the bulk pool temperature (by shuffling fuel back to the reactor cavity); (12) The apparent lack of proposal-specific planned emergency procedures; (13) The less-than-encouraging fuel handling record and operations record; and (14) An application which defers being "specific in the manner (of) modification".

Further SMP notes that the disassembly and handling of spent pins of waste fuel bundles on the scale proposed is an operation identified until this application, as the first step in fuel reprocessing, conducted in facilities designed and licensed for that purpose.

Q10-2

Which significant impacts in Q10-1 above arise from the pin compaction? Quantify.

RESPONSE

Preliminarily, SMP joins and here incorporates by reference, the response of the State of Maine to this interrogatory, especially insofar as it clearly recognizes the insufficiency of the Staff's EIA absent an adequate disclosure and/or analysis by Applicant.

More specifically, pin compaction has not yet been adequately described in detail with respect to means and methods, including design of equipment, safety features, emergency response plans, quality assurance and/or control programs (task-specific), and other conditions identified in responses throughout this set of interrogatories, to permit a quantified response to this question at this time. However it can be stated that SMP believes that pin compaction will: (1) Increase pool shine and inhalation doses to workers; (2) Increase volume and radioactive inventory, and types of waste; (3) Add to exposures resulting from normal SFP support operations; (4) Hamper cooling; (5) Lead to localized boiling and possibly criticality with attendant releases; and (6) Increase the likelihood and severity of accidents involving load drop. In the event of a reactor accident which precludes access to the SFP and which results in functional failure of SFP support systems, the density of the bulk load as described by the pinpacking proposal would lend to the probability, severity, and likelihood of propagation of a secondary accident involving criticality, and/or boil-off leading to significant, but only partially quantified, releases of radiation and radioactive materials to the human environment.

Q10-3

Why do you believe significant impacts (risk) arise from this action, considering that the spent fuel pool design is acceptable even in the event of a fuel assembly drop accident?

RESPONSE

SMP does not consider that the SFP design is acceptable even considering a fuel assembly drop accident for the reasons stated in responses to the foregoing questions, including especially the fact that SMP believes such accident to have been inadequately analyzed, excluding a number of possible targets and trajectories. Additionally, SMP joins and incorporates by reference the enumeration of impacts set forth in the response of the State of Maine to this interrogatory.

Q10-4

Which, if any, long term effects of spent fuel storage do you consider to have a significant impact?

RESPONSE

SMP joins and incorporates by reference the objection of the State of Maine in response to this interrogatory, and by way of brief example notes that the "long term effects" inquired upon by Staff are not in any way quantified: Is Staff referring to a twenty-five-plus year period beyond the license term, or a 24,000 year half-life, or something else?

However SMP is concerned that storage for an unspecified duration, but extending to the approximate end of the plant's licensed lifetime, may result in failure of systems and materials leading to effects on the human environment. One specific concern is that due to materials degradation, it may become impossible to remove spent fuel intact leading to unwarranted worker and public exposure to radiation.

Q10-5

Which specific factors would you have the EIS address which have not already been discussed in the Environmental Impact Appraisal (EIA)?

RESPONSE

SMP joins in and incorporates by reference the factors enumerated by the State of Maine in its response to this interrogatory, and directs the attention of Staff to the comments on the EIA included in responses above. Please also see SMP's "Comments" on the EIA filed with its supplemental or additional contentions, August 30, 1982.

SMP would also like to have the EIS address storage effects relative to some definite period of time under the conditions of the application, the long-term as well as short-term effects of accidents, and effects as defined by the EPA as well as the NRC.

A more complete answer to this question depends on information as yet not forthcoming from Staff or Applicant and described throughout

responses to questions above, as well as SMP's continuing efforts to interpret information already gathered or provided.

Q10-6

a. Upon what person or persons do you rely to substantiate in whole or in part your views on Contention SMP 10; State 6?

b. Provide the addresses, educational background of such proposed experts after high school (include all courses taken in area of expertise), the work experience of the proposed experts in the area of expertise, and a bibliography of any publications of the proposed experts.

c. Identify which of the above persons or any other person you may call as witnesses on this contention, and whether they have acted as witnesses in any other NRC proceedings.

d. Provide summaries of the views, positions or proposed testimony on this contention of all persons named in response to subparts (a) and (c) immediately above that you intend to present during this proceeding.

e. State the specific bases and references to any documents upon which the persons named in response to this interrogatory rely to substantiate their views regarding this Contention.

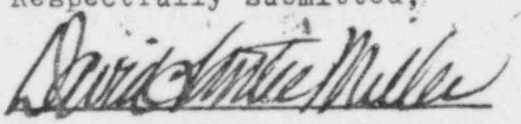
f. List all documentary or other material that you may use during this proceeding to support this contention or refer to during your examination of witnesses. The list should be by author, title, date of publication (if applicable), publisher (if applicable). In addition to listing such documents, provide a copy of all documents that are not NRC documents or documents provided to the NRC in this proceeding. Such documents need only be listed. If uncertainty exists as to whether a document was provided to the NRC, provide that document.

RESPONSE

SMP responds in conformity with its earlier answers to Staff's interrogatories of this kind, which prior responses are here incorporated by reference. Please see SMP Response to Interrogatory, Q1-3, set out above at 3-5.

AFTERWORD: The foregoing Answers to Interrogatories will be reviewed, updated, augmented, corrected and otherwise amended by SMP on a continuing basis. Should NRC Staff Counsel have any questions relative to these Answers, SMP is at least ready and willing to entertain and respond to informal means of clarification.

Respectfully submitted,



David Santee Miller
Counsel, Sensible Maine Power
Boothbay Harbor, Maine 04538
Telephone: (207) 633-4102