

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of:	)	Docket No. 72-22-ISFSI
	)	
PRIVATE FUEL STORAGE, LLC	)	ASLBP No. 97-732-02-ISFSI
(Independent Spent Fuel	)	
Storage Installation)	)	September 13, 1999

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STATE OF UTAH'S REPLY TO APPLICANT AND STAFF  
OPPOSITIONS TO LATE-FILED SECOND AMENDED UTAH  
CONTENTION Q<sup>1</sup>

INTRODUCTION

Pursuant to the Board's Order of September 9, 1999, the State of Utah hereby replies to the Applicant's and the Nuclear Regulatory Commission ("NRC" or "Commission") Staff's responses to the State of Utah's Request for Admission of Late-Filed Second Amended Utah Contention Q (August 23, 1999) ("State's Request"). Applicant's Response to State of Utah's Request for Admission of Late-Filed Second Amended Utah Contention Q (September 3, 1999) ("Applicant's Response"); NRC Staff's Response to State of Utah's Request for Admission of Late-Filed Second Amended Utah Contention Q (September 3, 1999) ("Staff's Response"). The

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<sup>1</sup>This Reply is supported by the Reply Declaration of Marvin Resnikoff in Support of State of Utah's Second Amended Contention Q (September 13 1999), which is attached hereto as Exhibit 1.

Applicant and the Staff object to the admissibility of the contention and the State's justification for the late filing. As discussed below, these objections are without merit.

## ARGUMENT

### I. SECOND AMENDED CONTENTION Q IS ADMISSIBLE.

Second Amended Contention Q challenges the adequacy of the Applicant's analysis of potential accidents that may damage the integrity of spent fuel cladding. In particular, the Applicant relies for satisfaction of 10 C.F.R. § 72.74(d) on a cask stability analysis by Holtec International, Inc. ("Holtec"), which is inadequate to show that the storage casks used at the proposed Private Fuel Storage ("PFS") facility will maintain their integrity under design accident conditions.

Both the Applicant and the NRC Staff argue that Second Amended Contention Q is inadmissible, because the issues it raises may only be addressed in the generic rulemaking for approval of the Holtec HI STORM storage cask. Applicant's Response at 7-8, Staff's Response at 3-4. In this context, the Applicant argues that the issue of the fuel assemblies' integrity under design basis drop conditions "is a generic one," and also that the State "has made no attempt to show how the conditions at PFS are unique." Applicant's Response at 8. This argument is without merit.

Both the Applicant and the Staff ignore the fact that NRC regulations governing the licensing of ISFSI's specifically require the license applicant to submit an

accident analysis that evaluates the “design and performance of structures, systems, and components important to safety, with the objective of assessing the impact on public health and safety resulting from operation of the ISFSI.” 10 C.F.R. § 72.24(d). This analysis must include the “determination” of the “adequacy of structures, systems, and components provided for the prevention of accidents and the mitigation of the consequences of accidents, including natural and manmade phenomena and events.” 10 C.F.R. § 72.24(d)(2). As set forth in the revised Safety Analysis Report (“SAR”) for the proposed PFS facility, the design features of the PFS facility include a maximum crane lift height of ten inches. SAR, Rev. 5 at 8.2-31.<sup>2</sup> Thus, PFS has designed the facility with the assumption that the fuel will not be damaged if a cask is dropped from a height of ten inches or less. If this assumption is faulty, then the safety analysis performed under 10 C.F.R. § 72.24(d)(2) is faulty, and there is no reasonable assurance the public health and safety will be adequately protected in the event of an accident. Therefore, the issues raised by Second Amended Contention Q are quite case-specific. Moreover, because they challenge the Applicant’s compliance with regulations that must be met in order to obtain an ISFSI license, they are material and litigable in this proceeding. Union of Concerned Scientists v. NRC, 735 F.1d 1437 (D.C. Cir. 1984), *cert. denied*, 469 U.S. 1132 (1985).

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<sup>2</sup>As noted in the Applicant’s Response at 5, note 9, Revision 5 of the SAR was submitted on August 27, 1999. Revision 5 incorporates the revised Holtec analysis on which PFS is relying for satisfaction of ISG-12.

The Applicant and the Staff also argue that the State has failed to raise a genuine dispute of material fact, on the ground that the State is incorrect in claiming that the Holtec analysis fails to consider the effects of irradiation on the cladding. Applicant's Response at 8-9, Staff's Response at 4-5. According to the Applicant and the Staff, the TSAR specifically states that the material properties used in the non-linear analysis are those for irradiated zircalloy, and the State provides no evidence to suggest that this isn't true. *Id.* The statement in the TSAR, however, is extremely vague. There is no discussion of what properties were actually considered, such as brittleness.

In addition, the Applicant argues that the State's assertion that dynamic loading from fuel pellets will significantly affect cladding integrity constitutes "mere speculation." Applicant's Response at 9. This argument ignores the very specific discussion in Second Amended Contention Q of the physical configuration of the fuel:

Within each fuel rod, the fuel pellets are stacked on their sides, inside the cladding. As Holtec acknowledges, during an horizontal drop, the cladding bows. When the cask drops, the individual pellets will break from their initial rigid constraint and strike the thin cladding. This has a dynamic effect similar to that of a "water hammer" that occurs in nuclear power plant piping. This would add an additional impulsive force on the cladding. Thus, the g force on the cladding may well be greater than the 45 g force to which the cladding is ostensibly designed. Holtec has not taken this significant dynamic effect into consideration.

State's Request at 9. The Applicant asserts that the fuel pellets travel less than 0.1 mm, but fails to acknowledge that Holtec itself has calculated that the rods will bow under deceleration. The cladding gap will not remain fixed under those condition.

Moreover, the pellets are discrete objects, not a continuous mass like the cladding. Under impact, the configuration of the pellets will not hold, thus subjecting the cladding to the hammer effect described in Second Amended Contention Q. Notably, the Applicant does not dispute that the pellets may move, but only disputes the significance of the movement. However, the Applicant's assertions consist only of statements by counsel, in contrast to the State's assertions, which are supported by the expert declaration of Dr. Resnikoff. The State has identified a genuine and material dispute with the Applicant regarding the dynamic effects of a drop accident, and therefore the issue should be admitted.

The Applicant and the Staff also argue that by the State's own calculations, the State's claims concerning the potential thinning of the cladding are not material to this proceeding. Applicant's Response at 9, Staff's Response at 5. According to the Applicant and the Staff, even if the full 17% thinning occurred, buckling would only occur at 50.81 g's by the State's calculations, which is still above the maximum design load of 45 g's. *Id.* These arguments misapprehend the State's position, which is that thinning of the cladding must be considered *in conjunction with* the other phenomena identified in ISG-12, *i.e.*, irradiation of the fuel, weight of the fuel pellets, and the dynamic effects of a cask drop accident. When considered together, these cumulative effects are highly likely to significantly decrease the maximum buckling load.

The Applicant also argues that thinning is not an issue, because the HI-STORM

storage cask is not presently certified to take the high burnup fuel that would cause the increased thinning. This argument is without merit. First, it should be noted that the HI-STORM storage cask has not been certified at all; it is still under review by the NRC. Moreover, the Applicant admits that it does intend to accept high burnup fuel in the future, although this would require an amendment of the HI-STORM certificate of compliance. *Id.* at 10, note 16. Finally, the industry trend is to have higher and higher burnup fuel. This is witnessed by the NRC's recent issuance of a Supplemental Environmental Impact Statement for the transportation of spent fuel, which addresses the cumulative impacts of transporting higher burnup and higher enrichment fuel. *See* Letter from Sherwin E. Turk to the Administrative Judges in this proceeding (September 9, 1999).

Finally, the Staff takes issue with the contention's assertion that "the cask maximum lift heights of 10 and 18 inches imply that vertical drops greater than these amounts would result in damage to the canister or interior contents," on the grounds that it is "speculation" and "fails to set forth an admissible issue." Staff's Response at 5. It can hardly be called speculative to infer that the maximum lift height is a component of the analysis of the safety of that height. This is borne out by the SAR, which compares the maximum lift height of 10 inches to the conclusion of the Holtec analysis that an 11 inch drop is within the design basis. SAR Rev. 5 at 8.2-31. Accordingly, the issue is admissible.

## II. SECOND AMENDED CONTENTION Q MEETS THE STANDARD FOR LATE-FILED CONTENTIONS.

Contrary to the arguments by the Applicant and the Staff, the State meets the 10 C.F.R. § 2.714(a) late filed factors for amending its contention.

**Good Cause:** The Staff concedes the timeliness of part of Second Amended Contention Q, relating to compounded embrittlement and thinning of the zircalloy cladding. Staff's Response at 7. While the Staff objects to the timeliness of some parts of the contention, the Applicant objects to the timeliness of the entire contention.

The Applicant argues that timeliness should be measured from the date when the State became aware of the issue of Holtec's failure to consider the effects of irradiation and pellet weight, which the Applicant calculates at 17 months ago. Applicant's Response at 3. This argument ignores the fact that the contention turns not upon whether these factors *should* be considered in an accident analysis, but whether they *were* considered adequately once a revised analysis was done. The State tried to raise the issue of whether these factors should be considered in November of 1997, when it filed its first set of contentions. The Applicant defended the LLNL study, and the Board ruled for the Applicant. Now both the Staff and the Applicant have, by their actions, confirmed the State's original criticisms of the LLNL study. In effect, the State has prevailed, without litigation, on the issue of whether the Applicant should be required to perform a new cask stability analysis. Now that the issue of the need for a revised analysis is resolved in the affirmative, the question presented is

whether the revised analysis that has been performed is adequate. To reject this amended contention on grounds of lateness would unjustly penalize the State for the Applicant's and Staff's tardiness in attempting to redress the deficiencies in the cask stability analysis which the State pointed out so long ago.<sup>3</sup>

The Applicant also contests the timeliness of the contention with respect to the issue of potential thinning of the cladding, on the ground that it is based on a 1998 NRC Information Notice rather than the Holtec revised analysis. Applicant's Response at 4. The cladding thinning issue was raised in relation to the adequacy of the Holtec analysis' evaluation of the characteristics of irradiated fuel. As discussed in the contention, the thinning of the cladding will have the effect of compounding the effects of embrittlement. The State was not untimely in raising this factor affecting the embrittlement characteristics of the fuel.

The Staff argues that the contention is untimely to the extent that it criticizes the revised Holtec analysis for failing to address the dynamic effect of a cask drop

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<sup>3</sup>Notably, the Applicant does not contend that the State is late if timeliness is measured against either Revision 5 to the SAR, the State's receipt of the revised Holtec analysis, or the Applicant's announcement of its intent to adopt the revised Holtec analysis in its license application. Clearly, no such claim can be made. Second Amended Contention Q was filed on August 20, 1999. As stated in the Applicant's Response, the Applicant filed an amendment to the SAR which incorporated the Holtec analysis, on August 27, 1999 – a week *after* the contention was filed. In its August 6, 1999 response to the State's Amended Contention Q, the Applicant announced its intent to adopt the Holtec analysis. The State received the Holtec revised analysis in late July, 1999. See State's Request at 13, note 6. Clearly, the contention is timely in relation to all of those events.



accident, because Holtec simply repeated the LLNL static analysis, albeit adding consideration of the weight of the fuel pellets and irradiated material properties. Staff's Response at 7-8. The Staff argues that the State could have contested the lack of a dynamic analysis much earlier, when it submitted Contention Q. *Id.* As recognized in ISG-12 however, there are several factors contributing to the overly "simplistic" approach of the LLNL analysis. These three complicating factors are embrittlement of the fuel, weight of the pellets, and the dynamics of the fuel behavior. As stated in the "Conclusion" section of ISG-12:

Analyses of fuel rod buckling performed to demonstrate fuel integrity following a cask drop accident yield results which contain a large margin to actual failure. The calculated onset of buckling does not imply fuel or cladding failure. Where such analyses yield unacceptable results, more realistic analyses of dynamic fuel behavior are appropriate and acceptable. If the cladding stress remains below yield, the fuel integrity is assured.

ISG-12 at 2. (See Exhibit 2 to State's Request). The Holtec analysis was prepared specifically in response to the criticisms of ISG-12. The issue raised by Second Amended Contention Q is whether the revised Holtec analysis, as adopted by the Applicant, addresses these factors adequately. The Staff's timeliness argument erroneously suggests that these factors could be raised piecemeal. They must, however, be examined together. It therefore was appropriate for the State to address them all in response to the Holtec revised analysis.

**Development of a Sound Record:** The Staff concedes that the State's participation "may arguably contribute to the development of a sound record." Staff's

Response at 10. The Applicant's argument that the State has not established Dr. Resnikoff's expertise has no basis. As set forth in his resume, which is referenced in his Declaration at paragraph 1, Dr. Resnikoff has extensive experience in the areas of nuclear waste storage and disposal. His qualifications are further demonstrated by the fact that the NRC Staff has adopted his concerns about the cask stability analysis in ISG-12. The Applicant's objections to Dr. Resnikoff's ability to contribute to a sound record on Second Amended Contention Q is entirely without merit.

**Availability of Other Means for Protecting The State's Interests:** The Applicant and Staff both argue that the State may protect its interests by participating in the generic rulemaking for the HI-STORM casks. That rulemaking, however, will not address the specific question of whether the PFS facility design is adequate to protect public health and safety. This is the *only* proceeding in which that question will be addressed. Moreover, the generic rulemaking is not the equivalent of an adjudicatory hearing. There is no discovery permitted in the rulemaking, and no opportunity to confront witnesses. The Commission has established a requirement for formal adjudicatory hearings in individual ISFSI licensing proceedings, rather than lumping all ISFSI-related matters into a rulemaking. Just as the Commission recognizes the difference between a rulemaking and an adjudication in its procedural regulations, so does the State. Because the Commission has given parties to ISFSI licensing cases the procedural protections afforded by formal adjudicatory hearings

rather than relegating them to a rulemaking, the State legitimately seeks to avail itself of these procedures with respect to Second Amended Contention Q.

**Representation by Another Party:** Neither the Staff nor the Applicant suggest that the State's position will be represented by any other party.

**Broadening of Issues or Delay of the Proceeding:** Both the Applicant and the Staff argue that admission of Second Amended Contention Q will broaden and delay the proceeding. Applicant's Response at 7, State's Response at 10. Although admission of the contention may broaden the proceeding somewhat, it is unlikely to delay it. The issues raised by the contention are discrete. Discovery can be taken and testimony can be prepared according to the proposed new schedule for the litigation of Group II issues. In weighing this factor, the Board should also bear in mind that whatever delay has occurred here has resulted from the tardiness of the Staff and PFS in responding to concerns raised by the State many months ago. The State should not be penalized for its success in finally persuading the Staff and PFS that a new cask stability analysis is needed.

## CONCLUSION

For the foregoing reasons, the Applicant's objections to the admission of Second Amended Contention Q are without merit. Accordingly, it should be admitted.

DATED this 13th day of September, 1999.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Denise Chancellor", is written over a horizontal line.

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### CERTIFICATE OF SERVICE

I hereby certify that a copy of State of Utah's Reply to Applicant and Staff Oppositions to Late-filed Second Amended Utah Contention Q was served on the persons listed below by electronic mail (unless otherwise noted) with conforming copies by United States mail first class, this 13th day of September, 1999:

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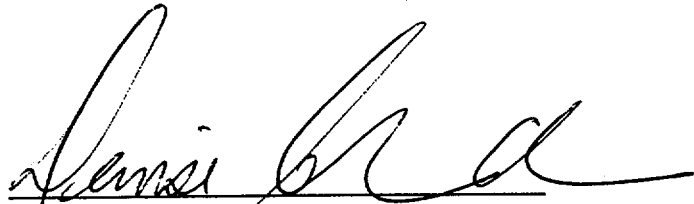
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UNITED STATES OF AMERICA  
BEFORE THE U.S. NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, L.L.C.	)	Docket No. 72-22-ISFSI
(Independent Spent Fuel	)	
Storage Installation	)	September 13, 1999
	)	

**REPLY DECLARATION OF DR. MARVIN RESNIKOFF IN SUPPORT OF  
STATE OF UTAH'S SECOND AMENDED CONTENTION Q**

1, Dr. Marvin Resnikoff, declare under penalty of perjury that:

1. I am the Senior Associate at Radioactive Waste Management Associates, a private consulting firm based in New York City. I am an expert in the field of nuclear waste transportation, storage, and disposal. A copy of my statement of qualifications was filed on November 20, 1997, as an exhibit to the State of Utah's contentions in this proceeding.

2. I am familiar with Private Fuel Storage's ("PFS's") license application and Safety Analysis Report in this proceeding, as well as the applications for the storage and transportation casks PFS plans to use. I am also familiar with NRC regulations, guidance documents, and environmental studies relating to the transportation, storage, and disposal of spent nuclear power plant fuel, and with NRC decommissioning requirements.

3. On August 20, 1999, I prepared a declaration which was submitted in support of the State of Utah's Request for Admission of Late-Filed Second Amended Contention Q (August 20, 1999). The declaration attested to the fact that the technical facts presented in the contention are true and correct to the best of my knowledge, and that the opinions expressed therein are based on my best professional judgment.

4. I also assisted in the preparation of the State of Utah's Reply to the Applicant's and NRC Staff's Responses to Late-Filed Second Amended Contention Q. The technical

facts presented in that pleading are true and correct to the best of my knowledge, and the conclusions drawn from those facts are based on my best professional judgment.

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\*Dr. Marvin Resnikoff

September 13, 1999

\* Dr. Resnikoff is traveling and unavailable to send his signed Declaration for filing toady. The original will be filed on Dr. Resnikoff's return.