LBP-99-42

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

G. Paul Bollwerk, III, Chairman
Dr. Jerry R. Kline
Dr. Peter S. Lam

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In the Matter of	Docket No. 72-22-ISFSI
PRIVATE FUEL STORAGE, L.L.C.	ASLBP No. 97-732-02-ISFSI
(Independent Spent Fuel Storage Installation)	November 2, 1999

MEMORANDUM AND ORDER
(Rulings on Summary Disposition
and Discovery Motions
Regarding Contention Utah H)

In its admitted contention Utah H, Inadequate Thermal Design, intervenor State of Utah (State) challenges the ability of the storage casks chosen by applicant Private Fuel Storage, L.L.C., (PFS) for use in its proposed Skull Valley, Utah 10 C.F.R. Part 72 independent spent fuel storage installation (ISFSI) to protect against overheating of the reactor spent fuel located inside those casks. In a May 19, 1999 motion, PFS seeks summary disposition in its favor on three of the five subparts to this contention based on a revised thermal analysis it submitted for one of the two designated cask systems. According to PFS, as a result of this analysis, there is no longer a genuine material

factual dispute with the State relative to these three points. Additionally, this PFS motion potentially could render moot a pending April 30, 1999 State request that PFS be compelled to answer certain discovery requests concerning the revised thermal analysis. The State contests the PFS assertions regarding both summary disposition and the State's motion to compel; the NRC staff, however, agrees that summary disposition is appropriate.

For the foregoing reasons, we conclude that a material factual dispute remains relative to the three contention subparts in question, so that the PFS motion must be denied. Further, we direct the parties to take further action relative to the State's motion to compel discovery and scheduling regarding litigation of this and other issues potentially involving the use of proprietary information, as described below.

I. BACKGROUND

A. Proposed PFS Storage System and Contention Utah H

As described in the safety analysis report (SAR) that accompanies the PFS application for authority to construct and operate its Skull Valley, Utah ISFSI facility, concrete storage casks holding metal cylinders containing multiple power reactor spent fuel assemblies will be placed on

concrete pads in a two by four array. The canister-based storage systems PFS has selected for use at its site are the Holtec International, Inc., (HI) Storage and Transfer Operation Reinforced Module Cask System, also known as the HI-STORM 100, and the Sierra Nuclear Corporation TranStor Storage Cask System, referred to as TranStor. Ultimately, the PFS facility could contain up to 40,000 metric tons of United States commercial power reactor spent fuel stored in approximately 4,000 casks. Further, as described in the SAR, the storage cask for each system is designed with a series of ducts intended to permit natural convection cooling of the metal cylinders containing the reactor spent fuel assemblies. See [PFS], [SAR] for [PFS] Facility at 1.2-1, 1.3-1, 1.3-3 (rev. 0 June 1997).

In LBP-98-7, 47 NRC 142, 188-89, clarified by, LBP-98-10, 47 NRC 288, 295, aff'd on other grounds, CLI-98-13, 48 NRC 26 (1998), the Licensing Board admitted in its entirety contention Utah H, in which the State raised concerns about the thermal design of the proposed cask systems. As accepted for litigation that contention provides:

> Utah H -- Inadequate Thermal Design
>
> CONTENTION: The design of the proposed ISFSI is inadequate to protect against overheating of storage casks and

of the concrete cylinders in which they are to be stored in that:

1. Storage casks used in the License Application are not analyzed for the PFS maximum site design ambient temperature of 110°F.

2. The maximum average daily ambient temperatures for unnamed cities in Utah nearest the site do not necessarily correspond to the conditions in Skull Valley; PFS should provide information on actual temperatures at the Skull Valley site.

3. PFS's projection that average daily temperatures will not exceed 100°F fails to take into account the heat stored and radiated by the concrete pad and storage cylinders.

4. In projecting ambient temperatures, PFS fails to take into consideration the heat generated by the casks themselves.

5. PFS fails to account for the impact of heating the concrete pad on the effectiveness of convection cooling.

6. PFS has not demonstrated that the concrete structure of the TranStor cask is designed to withstand the temperatures at the proposed ISFSI.

7. PFS has not demonstrated that the concrete structure of the HI-STORM cask is designed to withstand the temperatures at the proposed ISFSI.

Id. at 253.

B. PFS Dispositive Motion

By motion submitted May 19, 1999, accompanied by a statement of eleven material facts not in issue, PFS sought summary disposition regarding three portions of this contention. Specifically, PFS requests final merits resolution of paragraph three, regarding the impact on the projected ambient temperatures of heat stored and radiated by the concrete pad and concrete casks; paragraph four, concerning the impact on ambient temperature of the heat generated by the metal storage cylinders inside each concrete cask; and paragraph five, which concerns the impact of pad heating on the effectiveness of convection cooling process for each storage cask. According to PFS, the concerns expressed in these three paragraphs now have been addressed in a revised thermal analysis for the HI-STORM 100 cask system that PFS supplied to the staff in a February 1999 response to the staff's December 1998 requests for additional information (RAI). See [PFS] Motion for Partial Summary Disposition of Utah Contention H -- Inadequate Thermal Design (May 19, 1999) at 3-4 [hereinafter PFS Motion].

As described in the accompanying affidavit of HI principal engineer Dr. Indresh Rampall that is presented to

explain and support the PFS revised thermal analysis,[1] relative to paragraph three of the contention, the revised thermal analysis now takes into account the impact the heat stored and radiated by the concrete pad and other storage casks will have on the ambient air temperature entering the cask cooling ducts. This includes the solar radiative heating on exposed cask and pad surfaces; pad/cask and pad/soil conductive heat transfer; pad/ambient air and cask/ambient air convective heat transfer; and pad/cask and pad/ambient air radiative heat exchange. See id. Affidavit of Indresh Rampall (May 14, 1999) at 3.

In connection with paragraph four, the Rampall affidavit describes how the revised calculation imposes a reflecting and insulated hypothetical cylindrical boundary around the cask. This reflecting boundary is considered to direct all the heat radiated from the cask surface in the lateral direction back onto the cask, which mirrors the heat produced by and radiated from adjacent storage casks from all sides towards the analyzed cask. The insulating boundary, on the other hand, is intended to model radiation blocking by the reference cask in the lateral direction by

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[1] There have been no objections by PFS, the staff, or the State to the qualifications or expertise of the various affiants whose statements are relied upon to provide support for other parties' assertions regarding the material factual matters at issue in connection with contention Utah H.

other casks in the array, so that the radiative cooling of the reference cask in the lateral direction is conservatively neglected. Dr. Rampall concludes that this insulated, reflecting cylindrical boundary model effectively takes into account the heat generated by the casks themselves. See id. at 3-4.

Finally, as to paragraph five, the Rampall affidavit outlines how the revised model assumes that cooler air descending between the storage casks would be heated by the concrete pad and the concrete cask surface by thermal convection and radiation before entering the cask air inlet ducts. According to Dr. Rampall, this explicit inclusion of ambient air heating by heat stored in the pad and the casks in a global model enables the impact of these factors to be fully accounted for in determining the effectiveness of cask convection cooling. See id. at 4.

PFS concluded that this revised thermal analysis for the HI-STORM 1000 cask, in conjunction with the fact that this HI cask fully-loaded will have a higher calculated spent fuel cladding temperature than a fully-loaded TranStor cask so as to make the HI cask analysis bounding, established there is no remaining material factual dispute relative to paragraphs three through five of contention Utah H and that summary disposition should be entered in

favor of PFS on those matters. See PFS Motion at 7-8 & n.11.

In a June 25, 1999 response to the PFS motion, the staff agreed that summary disposition should be entered in favor of PFS on these three parts of contention Utah H, albeit only as they relate to the HI-STORM 100 cask. See NRC Staff's Response to [PFS] Motion for Partial Summary Disposition of Utah Contention H (Inadequate Thermal Design) (June 25, 1999) at 7-9 [hereinafter Staff Response]. In support of its position, the staff provides the affidavit of NRC senior nuclear engineer Jack Guttmann. Mr. Guttmann agrees with all of the PFS statement of material facts not in dispute describing how the revised thermal analysis addresses the claims in paragraphs three through five of contention Utah H, except material fact four regarding the status of the revised analysis as a bounding calculation for both the HI-STORM 100 and TranStor casks. Mr. Guttmann declares that the staff takes no position regarding this statement. See id. Affidavit of Jack Guttmann Concerning Contention Utah H (Inadequate Thermal Design) (June 25, 1999) at 2.

The State, in contrast, maintains that summary disposition on these three parts of the contention is inappropriate. Specifically, the State disputes paragraphs

five, seven, nine, and eleven of the PFS statement of material facts. It also asserts that the material provided by PFS regarding the revised thermal analysis is inadequate in that it does not include crucial information needed to evaluate the assumptions and methodology used in the model. See [State] Opposition to [PFS] Partial Motion for Summary Disposition of Utah Contention H -- Inadequate Thermal Design (June 25, 1999) at 7-8 [hereinafter State Response].

In support of these assertions, the State provides the affidavit of Radioactive Waste Management Associates senior associate Dr. Marvin Resnikoff, who declares as an initial matter that the Holtec calculation is wrong relative to all three paragraphs because it is based on an incorrect assumption about the minimum distance between casks relative to the PFS facility. Dr. Resnikoff states that this is significant because it goes to the central State point of the failure to account for thermal interaction via radiative heat transfer, not ventilation flow restriction that seems to be the focus of the revised HI thermal analysis upon which PFS relies. Radiative heat transfer is still not accounted for, Resnikoff declares, because its effect is to raise the surface temperature of each cask, which has not been factored into the HI analysis as is indicated by the fact that under the new analysis the radiative cask surface

temperature is not higher. See State Response, Declaration of Dr. Marvin Resnikoff Regarding Material Facts in Dispute with Respect to Contention H (June 25, 1999) at 2-4 [hereinafter Resnikoff Affidavit].

Moreover, according to Dr. Resnikoff, it is apparent with respect to paragraph three that radiative heat from the pad has not been taken into account because the canister temperature has not been raised, as one would expect because of the reduction in buoyant force. As to paragraph four, Resnikoff declares that radiative heat still has not been taken into account in that the hypothetical reflecting/insulated cylinder is the same model used by HI in its original calculations, rather than the interacting cylinder that is the focus of the State's concern, and fails to show any increase in the temperature of the reflective boundary that otherwise would be expected. And with regard to paragraph five, Dr. Resnikoff maintains that the impact of pad heating on convection cooling effectiveness has still not been accounted for given the discussion of annulus air flow and heat exchange via air cooling through heat vents does not reflect the rise in temperature on the cask that would be expected because of the smaller pressure differential between ingoing and outgoing vents as a result of pad heating. See id. at 4-6.

In addition to these deficiencies, Dr. Resnikoff also discusses how various PFS refusals to provide discovery information about cask surface temperatures arising under the revised HI analysis, including all input and output information and the underlying FLUENT computer source code that were used for the expanded HI-STORM 100 thermal model (EHT) that forms the basis for the revised analysis, have left him with inadequate information to ascertain whether the revised analysis does account for the various radiative heat sources that are the focus of these three parts of contention Utah H. See id. at 5-7. These PFS discovery refusals provide an additional basis for denying summary disposition, the State argues, see State Response at 5-6, as does the failure of the staff to establish that its own review of the revised HI analysis was done in an independent, rigorous manner, see [State] Reply to NRC Staff's Response to [PFS] Motion for Partial Summary Disposition of Utah Contention H (Inadequate Thermal Design) (July 8, 1999) at 2-4.

C. Discovery Dispute

Besides the PFS motion, there is a second matter pending with the Board regarding contention Utah H. By motion filed on April 30, 1999, the State seeks to compel a PFS response to discovery requests it propounded on April 9,

1999, regarding subparts three, four, and five of contention Utah H. Specifically, the State requested responses to three interrogatories and three document discovery requests. And in its motion, the State addressed the two objections put forth by PFS in its April 21, 1999 objections to these State discovery requests.

The State first asserts there is no merit in the PFS claim that discovery is not appropriate because the State requests are irrelevant, given these parts of the contention have been addressed by the new thermal analysis that is the basis for the PFS summary disposition motion described above. According to the State, PFS has failed to establish that the requests are burdensome or unnecessary relative to the admitted contention, so that the discovery should be permitted. Likewise meritless, according to the State, is the additional PFS objection that the discovery is overly broad because it involves the general thermal design of the casks. In this regard, the State asserts that it is impossible to address the adequacy of the site specific analysis for the casks without also addressing the general thermal design of the casks. See [State] Proprietary Motion to Compel [PFS] to Respond to State's First Set of Discovery Requests Regarding Contention H (Apr. 30, 1999) at 4-9.

In its May 7, 1999 response to the State's motion, PFS declared that it was willing to answer the State propounded interrogatories (albeit without waiving its objections). It further maintained, however, that it would not respond to the State's document requests because it still considered them overly broad and irrelevant given the Board's previous instruction that the scope of the contention is limited to site specific issues. See [PFS] Response to [State] Proprietary and Non-Proprietary Motions to Compel [PFS] to Respond to State's First Set of Discovery Requests (May 7, 1999) at 8-10 [hereinafter PFS Discovery Response]. Thereafter, on May 14, 1999, PFS provided responses to the three contention Utah H-related interrogatories, see [PFS] Amended Proprietary Responses to State's First Requests for Discovery (May 14, 1999) at 2-9, which have not been the subject of any further State motions. Nonetheless, as was discussed in section I.B. above, the State has continued to assert it should be given access to EHT-related information, including the associated FLUENT computer code.

II. ANALYSIS

A. Summary Disposition Standards

As the Board noted in several of its recent summary disposition rulings regarding other Utah contentions:

> As with the analogous Rule 56 of the Federal Rules of Civil Procedure, the movant bears the initial burden of making the requisite showing that there is no genuine issue as to any material fact, which it attempts to do by means of a required statement of material facts and any supporting materials that accompany the dispositive motion. An opposing party must counter each adequately supported material fact with its own statement of material facts in dispute and supporting materials, or the movant's facts will be deemed admitted. See Advanced Medical Systems, Inc. (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102-03 (1993).

E.g., LBP-99-31, 50 NRC 147, 152 (1999).

B. PFS Contention Utah H Partial Summary Disposition Motion

PFS has attempted to obtain a resolution of the concerns raised by the State in contention Utah H in much the same manner that it did relative to contention Utah C, Failure to Demonstrate Compliance with the NRC Dose Limits, which was the subject of a Board summary disposition ruling favorable to PFS in LBP-99-23, 49 NRC 485 (1999). As we explain below, however, we are unable to conclude that the same result obtains here.

Relative to LBP-99-23, in response to a State contention asserting that PFS in its application inappropriately used data from two NRC reports and failed to consider certain dose pathways, PFS proffered a new dose analysis that it declared did not rely upon the disputed

data in those documents and took into account the other dose pathways. The State countered by, among other things, asserting that it did not agree with the validity of the revised dose calculations. The Board concluded, however, that with respect to the existing contention, no material factual controversy existed, making summary disposition appropriate. The Board further observed that if the State wished to contest the new dose analysis, which was subsequently incorporated into the PFS application by an amendment, it should seek admission of a new, late-filed contention challenging the particulars of that analysis. See 49 NRC at 491-93.

In this instance, PFS has attempted to frame its new cask thermal analysis in much the same way, declaring that analysis addresses the purported deficiencies in the application as described in contention Utah H and that any State challenge to the analysis must be put forth as a late-filed contention. In disputing this assertion, however, the State has made a somewhat different argument than it did in connection with contention Utah C. To be sure, as it did with respect to the PFS revised dose analysis at issue for contention Utah C, the State indicates that it does not agree with the validity of the revised thermal analysis in many respects. The State also declares,

however, that the revised analysis has a more fundamental flaw in that it still fails to address what is the crux of the State's complaint in this contention: the failure to consider cask and pad radiative heat as part of the PFS analysis supporting its application.

In support of this assertion, the State's affiant Dr. Resnikoff declares generally that although the effect of radiative heat transfer from adjacent casks is to increase each cask's surface temperature, he does not believe this was taken into account in light of the PFS refusal to provide information on cask surface temperature. He also states that adjacent cask radiative heating has not been taken into account given PFS's admission that the original calculation did not account for the thermal effects of casks on each other or of the pad on the cask and the fact that the radiative cask surface temperature in the original calculation and the revised thermal analysis are the same. In addition, relative to contention subpart three, Dr. Resnikoff declares that it is not apparent the heat stored and radiated by the concrete pad was taken into account under the revised analysis because the buoyant force has not been reduced. Further, according to Dr. Resnikoff, it is not apparent that the heat radiated by the casks themselves or by adjacent, interacting casks has been taken into

account in connection with subpart four, particularly given the fact that the temperature of the reflective boundary for the revised analysis is the same as in the original calculation. Dr. Resnikoff also declares, with respect to subpart five regarding impact of concrete pad heating on convection cooling effectiveness, that based on the information provided, it is not apparent that the revised calculation takes into account concrete pad radiative heat. See State Response, Resnikoff Affidavit at 3-6.

The upshot of this State showing is to establish that there remain material factual disputes about whether cask and pad radiative heat, the central concern of subparts three, four, and five of contention Utah H, have been addressed in connection with the PFS application thermal effects analysis. As a consequence, partial summary disposition on these matters cannot be entered as requested by PFS.

C. State Contention Utah H Discovery Motion

Having determined that the PFS dispositive motion should not be granted, we address the outstanding document production dispute regarding contention Utah H. In doing so, we note that our ruling above appears to eliminate a major precept of the PFS objections to this discovery, i.e., that the State's requests are not relevant in light of its

pending summary disposition request and the supporting revised thermal analysis. With this in mind, as well as our previous statements regarding the site-specific nature of contention Utah H, see LBP-98-10, 47 NRC at 295, we think it best at this juncture that the parties reassess both the document requests and the objections thereto in an attempt to identify exactly what material remains in dispute.[2] If, after further discussions, the parties are still unable to agree on disclosure, PFS should file a motion for protective order that, with as much specificity as possible, identifies the material still in dispute and outlines its reasons for withholding that material. This motion should be filed on or before Friday, November 19, 1999, and any State response thereto should be filed on or before Tuesday, November 30, 1999.

D. Administrative Matters Concerning Propriety Information

In addition to these substantive rulings, we note that although contention Utah H was not originally identified as including the use of nonpublic, proprietary information, the parties' discovery and summary disposition filings make it

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[2] In this regard, it appears that the PFS concern about the restricted availability of the FLUENT code, see PFS Discovery Response at 10 n.20, in and of itself, does not constitute a basis for nondisclosure but rather a circumstance that requires special arrangements between the parties so that the State can obtain access to the information.

clear that such information could be involved. As a consequence on or before Wednesday, November 10, 1999, the parties should advise the Board in a joint filing (1) whether they anticipate that any hearing on this contention, contention Utah GG, Failure to Demonstrate Cask-Pad Stability During Seismic Event for TranStor Casks, or any other contention will involve the use of propriety information such that the proceedings should be closed; and (2) if a closed hearing is necessary, whether proceedings on those contentions should be held in conjunction with the closed hearing on contention Security-C as outlined in the parties' November 1, 1999 joint report on scheduling for that issue, or should be conducted under another schedule, bearing in mind the Board's preference for conducting closed hearings at the Atomic Safety and Licensing Board Panel Hearing Room in Rockville, Maryland.

Finally, on or before Wednesday, November 10, 1999, the State, PFS, and the staff should advise the Board in a joint filing whether they have any objection to the public release of any part of this memorandum and order because it would involve the disclosure of propriety information subject to nondisclosure under 10 C.F.R. § 2.790.

III. CONCLUSION

Notwithstanding the revised thermal analysis submitted by PFS relative to the HI storage system, its May 19, 1999 partial summary disposition motion must be denied because the State has established that material factual disputes still remain regarding the central assertion in subparts three, four, and five of contention Utah H that cask and pad radiative heat have not been considered in the analysis supporting the PFS application. Further, because this ruling raises significant questions about the basis for the previous PFS objections to the State's April 9, 1999 document discovery request concerning contention Utah H, the Board directs that the parties confer further on the scope of disputed discovery and establishes a schedule for additional filings regarding that discovery. Finally, the Board requests a joint report by the parties concerning proposed hearing schedules for portions of the proceeding that may involve the use of proprietary information.

For the foregoing reasons, it is this second day of November 1999, ORDERED, that:

1. The May 19, 1999 motion of applicant PFS for partial summary disposition regarding contention Utah H is denied.

2. Relative to the April 30, 1999 State motion to compel a response by PFS to its April 9, 1999 request for production of documents relative to contention Utah H, the parties should consult and make any additional filings in accordance with the schedule set forth in section II.C. above.[3]

3. In accordance with the schedule set forth in section II.D. above, the parties should file a joint report

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[3] If a filing permitted under this memorandum and order includes information the filer believes is proprietary, in accordance with the Board's December 31, 1997 directive regarding service of proprietary information, see Licensing Board Order (Granting Leave to File Response to Contentions and Schedule for Responses to Late-Filed Contentions) (Dec. 31, 1997) at 2-3 & n.1 (unpublished), the filing should (1) be served in the manner and on the individuals described in paragraphs I.H.1.a.-b. of the Board's December 17, 1997 memorandum and order, as amended, and include a cover letter or memorandum that shall be served on all other participants as described in paragraph I.H.2. of that issuance, see Licensing Board Memorandum and Order (Protective Order and Schedule for Filing Security Plan Contentions) (Dec. 17, 1997) at 8, 9 (unpublished); Licensing Board Memorandum and Order (Additional Amendments to Protective Order) (Dec. 23, 1997) at 2 (unpublished); and (2) be served so as to ensure receipt by the individuals described in paragraph I.H.1.a. of the Board's December 17, 1997 memorandum and order by the next business day.

providing the requested information concerning the potential use of proprietary information in this proceeding.

THE ATOMIC SAFETY
AND LICENSING BOARD[4]

G. Paul Bollwerk, III
ADMINISTRATIVE JUDGE

Jerry R. Kline
ADMINISTRATIVE JUDGE

Peter S. Lam
ADMINISTRATIVE JUDGE

Rockville, Maryland

November 2, 1999

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[4] Copies of this memorandum and order were sent this date to counsel for applicant PFS and for intervenor State of Utah by overnight/express mail, and to staff counsel through the agency's internal mail system (or some other method that will provide for delivery within a time frame comparable to that afforded PFS and the State). In addition, this date a memorandum was sent by e-mail to all the parties in this proceeding advising them of the issuance of this decision and the Board's determination to afford this decision confidential treatment pending a response by the State, PFS, and the staff to the Board's inquiry under ordering paragraph three above. See Licensing Board Memorandum (Notice Regarding Issuance of Decision on Motion for Partial Summary Disposition of Contention Utah H) (November 2, 1999) (unpublished).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB M&O (LBP-99-42) re RULINGS...CONTENTION UTAH H have been served upon the following persons by U.S. mail, first class, except as otherwise noted and in accordance with the requirements of 10 CFR Sec. 2.712.

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Dated at Rockville, MD this
11th day of November 1998

Office of the Secretary of the Commission

* Express mail
** Hand delivered