RAS 5446 72-22-ISFSI — Applicant Exhibit 224 — Rec'd 6/3/02

COPY OF TRANSCRIPT

DOCKETED
USNRC

2003 JAN 21 PM 3:43

OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	) Docket No. 72-22
	) ASLPB No. 97-732-02-ISFSI
PRIVATE FUEL STORAGE L.L.C.	) TELEPHONE DEPOSITION OF:
(Private Fuel Storage Facility)	) **KRISHNA P. SINGH** and **ALAN I. SOLER**
	) (Utah Contention L/QQ)

Wednesay, March 6, 2002 - 9:12 a.m.

Location: Office of the Attorney General
160 East 300 South, 5th Floor
Salt Lake City, Utah

Reporter: Vicky McDaniel
Notary Public in and for the State of Utah

NUCLEAR REGULATORY COMMISSION

Docket No. ________ Official Exh. No. 224
In the matter of ________
Staff ________ IDENTIFIED ✓
Applicant ✓ RECEIVED ________
Intervenor ________ REJECTED ________
Other ________ WITHDRAWN ________
DATE 06-03-02 Witness Khan
Clerk Susette Snider

CitiCourt, LLC
THE REPORTING GROUP

50 South Main, Suite 920
Salt Lake City, Utah 84144

801.532.3441 TOLL FREE 877.532.3441 FAX 801.532.3414

SECY-02

Template = SECY-028

Off the record.

(Discussion off the record.)

A. (DR. SOLER) Okay, now ask your question again.

Q. Is it fair to characterize your response in the last deposition, or I guess in general that NRC had compared portions of what I now know as Dynamo for wet storage to other nonlinear codes?

A. (DR. SOLER) Well, I'm not sure what the NRC has done independently, but as part of a number of submissions for particular utilities in wet storage applications, we were of course asked questions by the NRC staff reviewer, and previous to the submittal we were also sometimes asked questions by the utility reviewers before submittal. And if you take all of the submittals that we've made since when we started and through the wet storage period, there have been a whole range of problems considered. And there of course is a validation report that's been issued with different classical problems, both linear and nonlinear. Their "exact" solutions or their numerical solutions from other sources were compared with the results that we would get for the same problem.

So while you could not say that a particular wet storage submittal was completely modeled by another program and compared with the results that we got, portions of the program were compared by testing the problem that had been done in the literature, or, in one case, a finite element model using ANSYS that was made up by a utility to characterize all of the features like nonlinear springs and gap elements that was in their model.

Q. You mentioned a validation report. Is this a formal document that's submitted to NRC?

A. (DR. SOLER) Yes, I believe it's in the public document now.

Q. And approximately how large is that validation?

A. (DR. SOLER) Like that (indicating). I believe, maybe I'm wrong, but we submitted at one time a table of contents to that report.

Q. Did you submit a validation report with the TSAR?

A. (DR. SOLER) No.

Q. Dr. Singh, do you want to add?

A. (DR. SINGH) May I supplement the response?

Q. Yes.

A. (DR. SINGH) One of the essential undertakings we have in nuclear plant design and analysis activities is to ensure that the computer codes we use are thoroughly checked and validated. It's one of our simple commitments in designing and doing analysis. This computer program Dynamo has been the workhorse for the industry, over 60 nuclear power plants. The fuel racks in the pools are designed and analyzed and the safety margins established using this program. So of course we placed a great deal of emphasis on validating it against a variety of potential problems and characteristics of problems.

NRC over the years also, because the code was increasingly -- had become increasingly -- had become the vehicle for establishing margins of safety, asked us to perform some rather extreme validations. We picked out, for example, problems from the literature where solutions may be nonunique, truly nonunique problems, the problems that have bifurcation, for example. And we demonstrated this program could simulate that, even those rather arcane physical problems.

So this program has gone through very extensive valuation, far more than a general purpose program such as ANSYS would be for this class of problems, because it's very focused. It's focused on freestanding structures with potentially rattling masses inside. Okay? So that's the general sense I want to give you.

Q. Okay, thank you. The validation reports, are they submitted with each use of Dynamo?

A. (DR. SOLER) No. It's a one stair on the docket, we simply refer to them.

Q. When was the last time the validation report was updated, approximately?

A. (DR. SOLER) I probably cannot give you an honest answer on that, because I just don't know. We have validated various versions of the code as we've upgraded, but our QA procedure, depending on the upgrade, allows us to do an upgrade of the code by comparing solutions from the previous version. It's only when we introduce some new feature to the code that can't be validated by checking it against the previous solution. I would characterize most of our recent changes in the code have been one of increasing its dimensions so we can do larger problems and to change output statements so we can get more information out of the code. And of course, even though you change something as mundane as an output statement, you still have to ensure that inadvertently you haven't altered some of the other features in the code.

So a general validation report has only been updated when we've added a completely new feature that we can't validate or that may affect some of our validations, and to my knowledge, we haven't had to do that.

Q. And does this validation report include a description of what -- a general description of what portion of Dynamo was compared with what specific model?

A. (DR. SOLER) Well, the validation report is broken up into a series of I believe 12 to 14 test problems which come from various sources in the literature or from running a finite element code such as ANSYS. These problems are described the way the literature describes them, and then we describe how we model that particular problem, what it is supposed to check. And then of course we give our results and compare them with the results in the literature.

Clarify a little bit: when you asked me a question about portions of the code that you're checking, you should understand that a portion of the code may be to check the performance of the gap element model that's in the code. But the entire code is used to run that particular problem, but we're focusing on one aspect of the problem we're checking.

Q. Is it fair to characterize you're focusing on a result, or --

A. (DR. SOLER) By example, if we are trying to simulate an object -- let's keep it very simple. I drop a ball, it bounces and comes back. There's a classical solution for that; and in that analysis, if we wanted to analyze that numerically with our code, what we would be checking is the gap element model. We would set up the data file, run the problem with our gap element, and compare the results that we get with the results in the classical literature.

Q. Dr. Soler, have you used ANSYS for any nonlinear analysis in general?

A. (DR. SOLER) Yes.

Q. Have you used it for any cask stability analysis?

A. (DR. SOLER) No.

Q. When was the last time, to the best of your recollection, that you used ANSYS?

A. (DR. SOLER) Personally as a user?

Q. Yes.

A. (DR. SOLER) Last night.

Q. That's recent. And do you believe you could benchmark Dynamo with ANSYS?

A. (DR. SOLER) One of the early problems we dealt with where we were benchmarking a code, a utility made up a problem. In other words, they developed a mass, spring, damper, gap element, friction element model. Had no relation to the particular racks that we were studying at the time, but it was made up for the purpose of testing the results that they would get from ANSYS and the results that we would get from our program. So it did not specifically deal with racks per se. And we got good agreement with their model and their model.

In later years, for one of the projects that we worked on we were directed to use ANSYS rather than our code because of the review process involved. The reviewers wanted a commercial code to be used, not a special purpose code. So they directed -- the client directed us to use ANSYS in our modeling of the spent fuel racks. When we did that, the third-party independent reviewer that the client engaged to check our results independently used his version of ANSYS on his computers and found that he got different results. They were small differences in displacements, general agreement in the forces.

At the time it was thought that perhaps the problem had to do with the discrepancy in the Pentium chips. That was when they first came out. But after investigation we could not ascribe the problems that were being seen to the Pentium chip. And during our