

RAS 1876

2414

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC
00 JUL -6 A9:51

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

COPY

U.S. Nuclear Regulatory Commission
Sheraton Hotel

150 West 500 South, Wasatch Room

Salt Lake City, Utah 84101

Tuesday, June 27, 2000

The above-entitled matter came on for hearing,
pursuant to notice, at 9:00 a.m.

BEFORE:

THE HONORABLE G. PAUL BOLLWERK, III

Administrative Judge

Atomic Safety & Licensing Board Panel

DR. JERRY R. KLINE

Administrative Judge

Atomic Safety & Licensing Board Panel

DR. PETER S. LAM

Administrative Judge

Atomic Safety & Licensing Board Panel

1 APPEARANCES:

2

3 FOR THE STATE OF UTAH, ATTORNEY GENERAL'S OFFICE::

4

Denise Chancellor, Esq.

5

Connie Nakahara, Esq.

ASSISTANT ATTORNEY GENERAL

Office of the Attorney General

6

160 East 300 South, 5th Floor

7

P.O. Box 140873

Salt Lake City, UT 84114

8

9

Diane Curran, Esq.

HARMON, CURRAN, SPIELBERG &

EISENBERG, LLP

10

Attorneys at Law

11

1726 M Street, N.W., Suite 600

Washington, D.C. 20036

12

FOR THE PRIVATE FUEL STORAGE, L.L.C.:

13

Jay Silberg, Esq.

14

Ernest L. Blake, Esq.

SHAW, PITTMAN, POTTS & TROWBRIDGE

15

Attorneys at Law

16

2300 N Street, N.W.

Washington, DC 20037

17

18 FOR THE SKULL VALLEY BAND OF GOSHUTE INDIANS:

19

Danny Quintana, Esq.

20

Danny Quintana & Associates, P.C.

50 West Broadway, Fourth Floor

21

Salt Lake City, UT 84101

22

23

24

25

1 FOR THE U.S. NUCLEAR REGULATORY COMMISSION:

2 **Sherwin E. Turk, Esq.**
 3 **Catherine Marco, Esq.**
 4 **Mark Delligatti, Esq.**
 Office of the General Counsel
 Mail Stop - 0-15 B18
 U.S. Nuclear Regulatory Commission
 Washington, D.C. 20555

7 **I N D E X**

8 **WITNESS**

PAGE

9 **JOHN D. PARKYN**

Direct Examination by Mr. Silberg	_____	2423
Cross-Examination by Ms. Marco	_____	2425
Cross-Examination by Ms. Chancellor	_____	2426
Redirect Examination by Mr. Silberg	_____	2471
Recross-Examination by Ms. Curran	_____	2475

12 **ALEX McKEIGNEY/ROBERT WOOD**

Direct Examination by Ms. Marco	_____	2477
Cross-Examination by Ms. Curran	_____	2483
Redirect Examination by Ms. Marco	_____	2484
Rebuttal Examination by Ms. Marco	_____	2549

16 **MICHAEL F. SHEEHAN**

Further Redirect Examination by		
Ms. Chancellor	_____	2486
Further Recross-Examination by		
Mr. Silberg	_____	2492
Further Recross-Examination by		
Ms. Marco	_____	2526
Further Recross-Examination by		
Mr. Turk	_____	2531
Further Redirect Examination by		
Ms. Chancellor	_____	2538

P R O C E E D I N G S

[9:04 a.m.]

JUDGE BOLLWERK: Good morning, everyone.

4 We're back this morning to begin again the
5 evidentiary hearing in the Private Fuel Storage
6 proceeding.

Monday through Thursday of last week we heard, I guess, testimony and received evidentiary materials regarding two of the technical contentions in the proceeding, Utah R and Utah E/Confederated Tribes F, and then we broke on Thursday afternoon to have limited appearance statements on Friday, both afternoon and evening, and on Saturday afternoon, during which time the Board heard from about 60 individuals presenting different points of view about the proceeding and the proposal that Private Fuel Storage has pending with the Commission.

19 We're back today to hear testimony with
20 respect to Contention S. We're going to start with
21 Contention S this morning.

22 This is an open session. I don't know if
23 there are any members of the public here necessarily,
24 but they were certainly invited both Friday, Saturday
25 and on the web site. So we certainly made it obvious

1 that this is supposed to be an open session this
2 morning.

3 When we're finished with Contention S, we
4 will then -- off the record we had a brief discussion
5 about rebuttal, and we'll try to do the whole of
6 Contention S, finish it up, and then we'll go back into
7 closed session.

8 We need to hear staff testimony on
9 Utah E/Confederated Tribes F and have any rebuttal with
10 respect to that contention.

11 Is that the order of presentation as the
12 parties understand it? Any questions about that?

13 All right. I guess the other thing I should
14 mention, I understand that Mr. Turk and Mr. Wood were
15 away receiving an award from the Nuclear Regulatory
16 Commission, a meritorious service award.

17 Congratulations, sir.

18 MR. TURK: Thank you very much.

19 JUDGE BOLLWERK: I'm not sure if that's a
20 bigger event than Mr. Silberg's anniversary or not.
21 But I understand it comes with some money, and I think
22 there's an offer to lunch and dinner and all kinds of
23 things.

24 Anyway, congratulations to both of you.

25 MR. TURK: Thank you very much.

1 JUDGE BOLLWERK: And at this point let me ask
2 the parties if they have anything administrative before
3 we get going.

4 MS. CHANCELLOR: Yes, I do, Your Honor. My
5 understanding was that the order of presentation would
6 be PFS, the staff and then the state. And I've noticed
7 that in the order of cross-examination the state has
8 been first to cross-examine PFS's witness, and given
9 the Board's order, I'd request that the staff do their
10 cross-examination of PFS's witness before the state
11 does the cross-examination.

12 JUDGE BOLLWERK: Anything either of the
13 parties want to say about that?

14 MS. MARCO: I don't have any particular
15 objection to that.

16 JUDGE BOLLWERK: All right. Applicant?

17 MR. SILBERG: Seems to me it's between the
18 staff and the state.

19 JUDGE BOLLWERK: All right.

20 MS. MARCO: We may have an objection.

21 MR. TURK: Ms. Marco has taken the lead on
22 this contention, so I would defer to her. But I think
23 it would be useful for us to hear the state's
24 cross-examination first and maybe that there are some
25 additional points we want to bring out after their

1 examination that may lead from their examination. That
2 has happened before, and I think that was useful for
3 us.

4 And I do not hear a reason from the state to
5 suggest that it follow our cross-examination.

6 JUDGE BOLLWERK: Well, I think the reason as
7 stated, if I understood, was that because of the order
8 of examination, which is -- the order of the witnesses,
9 rather, which is the applicant, the staff and then the
10 state, that the cross-examination would follow the same
11 order.

12 Is that basically it?

13 MS. CHANCELLOR: That's correct, Your Honor.

14 JUDGE BOLLWERK: Well, I don't hear any
15 objection as to Contention S, is that correct, since
16 she's the lead counsel, or are you now objecting to --

17 MS. MARCO: With respect to Contention S,
18 I --

19 MR. TURK: I think it's a precedent that I
20 would not like to affect future litigation. I think it
21 would be very useful to the staff to hear the state's
22 cross-examination before we proceed with our own. It
23 may be that cross-examination plans change as a result.
24 So perhaps for S we can accept the switch. But next
25 summer we'll be here for several weeks' appearance, and

1 I'd like to reserve our right to follow the normal
2 order with contentions.

3 JUDGE BOLLWERK: All right. With respect to
4 Contention S, we'll go ahead and deal with it that way.
5 And when we get back to E -- let the Board think about
6 this a little bit. I guess, actually, we're in a
7 different situation with E.

8 MS. CHANCELLOR: I can respond if you like,
9 Your Honor, or we'll just wait until we get to E,
10 whatever your preference.

11 JUDGE BOLLWERK: I think since E, we're
12 dealing with staff witnesses, I don't think it's going
13 to -- at least not directly, unless we go to rebuttal,
14 it's going come up.

15 MS. CHANCELLOR: Yes, it will come up in
16 rebuttal.

17 JUDGE BOLLWERK: I think the problem that you
18 recognize is that if you do your cross-examination and
19 then there's further questions you want to ask based on
20 staff, then your cross-examination is over. Is that
21 the problem you're running into?

22 MS. CHANCELLOR: Well, it came up in
23 Mr. Parkyn, as an example, in Mr. Parkyn's construction
24 testimony where his response to the staff was different
25 from his response to me on one issue, and I felt like I

1 was at a disadvantage because of going second.

2 And another point is the Board has recognized
3 that the staff is more aligned with the applicant. And
4 while the staff does like the opportunity to follow the
5 state, the state believes that's so that the staff can
6 rehabilitate PFS's witnesses, and I think that that is
7 grossly unfair to the state.

8 MR. TURK: If I may respond, it's not our
9 intention to rehabilitate either the state's witnesses
10 or the PFS witnesses. It's our intention to bring out
11 the facts as we understand them to be true, and if it
12 happens that a PFS witness, in answers to our
13 questions, states something more clearly than he may
14 have said previously, I think that's fair. The point
15 is to have a clear and accurate record.

16 JUDGE BOLLWERK: All right. Well, with
17 respect to Contention S, we'll have the order of
18 cross-examination being the state -- I'm sorry, the
19 staff and then the state. With respect to other
20 contentions, we'll withhold ruling on that and deal
21 with it when the time comes.

22 All right. Anything else administrative that
23 needs to come up, needs to be discussed at this point?

24 All right. And again, I still do not see any
25 members of the public here that don't have some

1 relationship to any of the parties; is that correct?
2 That doesn't make a difference. I just want to make
3 sure that -- I sort of had a little speech I was going
4 to give, but I'm not going to go through it if there's
5 not anybody here.

6 All right. Why don't we just begin, then,
7 with Contention Utah S, and I believe the applicant has
8 the first panel.

9 MR. SILBERG: Yes. I would ask Mr. Parkyn to
10 retake the stand, please.

11 I believe he remains under oath.

12 JUDGE BOLLWERK: That's right.

13 You've been sworn in and remain under oath,
14 sir.

15 JOHN D. PARKYN,
16 called as a witness on behalf of the Applicant, having
17 been previously duly sworn, was further examined and
18 testified as follows:

19 DIRECT EXAMINATION

20 BY MR. SILBERG:

21 Q. Mr. Parkyn, I'm showing you a document
22 entitled "Testimony of John D. Parkyn on
23 Decommissioning the PFSF - Contention Utah S,"
24 comprised of 80 pages together with a one-page
25 attachment or exhibit. Was this document prepared

1 under your direct supervision and control?

2 A. It was.

3 Q. And is it true and correct to the best of
4 your knowledge and belief?

5 A. It is.

6 Q. And does it set forth your testimony on this
7 contention together with your resume?

8 A. It does.

9 Q. And do you adopt it as your testimony and
10 your resume for this contention?

11 A. I do.

12 MR. SILBERG: Mr. Chairman, I'm handing the
13 reporter the document that I've just identified and ask
14 that it be incorporated in the transcript at this point
15 as if read as the testimony of Mr. Parkyn on Contention
16 Utah S.

17 JUDGE BOLLWERK: All right. Any objections?

18 MS. MARCO: No objection.

19 JUDGE BOLLWERK: All right. There being no
20 objections, the testimony of Mr. Parkyn with the
21 attached resume and curriculum vita shall be entered
22 into the record at this point as if read.

23 [Whereupon, the direct written
24 testimony of Mr. John D. Parkyn
25 was inserted in the record.]

May 15, 2000

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
PRIVATE FUEL STORAGE L.L.C.)	Docket No. 72-22
)	
(Private Fuel Storage Facility))	ASLBP No. 97-732-02-ISFSI

TESTIMONY OF JOHN D. PARKYN ON
DECOMMISSIONING THE PFSE – CONTENTION UTAHS

Q1. Please state your full name.

A1. John D. Parkyn

Q2. By whom are you employed and what is your position?

A2. I am currently serving as Vice President of Genoa Fuel Tech, a subsidiary of Dairyland Power Cooperative and am Chairman of the Board of Managers of Private Fuel Storage, L.L.C. I am also Chairman and CEO of the Great Salt Lake and Southern Railroad and a Director of River Bank in La Crosse, Wisconsin.

Q3. Please summarize your educational and professional qualifications.

A3. I received a bachelor's degree in nuclear engineering from the University of Wisconsin. I am a licensed Professional Engineer in Wisconsin and a licensed Professional Nuclear Engineer in California. I have served as a member of the National Planning Committee for the American Nuclear Society and I am a past Chairman of the Wisconsin Division of the American Nuclear Society. I also served on the Evaluation and Review Group for the Institute of Nuclear Power Operations. I have written many papers on nuclear energy and its implementation.

I have worked with nuclear power for over 30 years. From 1967 to 1969 I served as a certified reactor operator with the U.S. Army at White Sands Missile Range. From 1972 to 1974 I was an operations engineer, fuel shipping supervisor, and a licensed Senior Reactor Operator at Wisconsin Electric Power Company's Point Beach Nuclear Plant, where my responsibilities included budgeting and costing of changes to the plant. In 1974 I moved to Dairyland Power Cooperative, where I worked as an Operations Engineer, Shift Technical Advisor, Fuel Shipping Supervisor, Shift Supervisor, and Senior Reactor Operator at the La Crosse Boiling Water Reactor. From 1979 to 1982 I was the Assistant Superintendent at La Crosse where I ran plant operations and oversaw site security. In 1982 I became Plant Manager and Acting Chief Executive Officer for Nuclear Power. I was responsible for oversight of plant operations and all of the budgeting and staffing for the site and managed the plant as it shut down and commenced decommissioning. In 1994 I shifted my focus to the disposition of spent nuclear fuel and moved to work on the Mescalero Fuel Storage project. I stayed with the project when it became Private Fuel Storage.

I am currently serving on the Governor's Commission on Passenger Rail in Wisconsin. I have also served as a member of the Wisconsin Legislative Study Committee on Railroads. I have served in a number of positions of responsibility in my community. I have been Chairman of the Board of the Bank of Stoddard, Wisconsin and the Bank of Ferryville, Wisconsin. I have served as the Treasurer of the School District of La Crosse, Wisconsin and the Vice Chairman of the Finance Committee of Vernon County, Wisconsin.

My resume is attached as Exhibit 1.

Q4. What is your experience with and base of knowledge regarding the decommissioning of nuclear facilities?

A4. The La Crosse nuclear power plant shut down in 1987 and commenced decommissioning. As Plant Manager and Acting Chief Executive Officer for Nuclear Power at the plant from 1982 to 1994, I was responsible for running the

project as plant manager and also the budgeting and staffing at the plant while it was preparing for decommissioning and while decommissioning was underway.

Q5. Are you familiar with the Private Fuel Storage Facility (PFSF) and the activities that will take place there?

A5. Yes

Q6. What is the basis of your familiarity with the PFSF?

A6. I am responsible for the operation of the company that will construct, operate and decommission the facility.

Q7. Are you familiar with the preliminary decommissioning plan and the decommissioning funding plan for the PFSF?

A7. Yes. I prepared the decommissioning funding plan for the PFSF.

Q8. What is the purpose of your testimony?

A8. The purpose of my testimony is to address the adequacy of Applicant's decommissioning funding plan, in response to Contention Utah S, in which the State alleges that:

Basis 1. The Applicant has failed to provide reasonable assurance that funds will be available to decommission the ISFSI, in that the Applicant's letter of credit does not include funds for the decommissioning of the spent fuel storage casks.

Basis 4. The Applicant has failed to justify the basis for its decommissioning cost estimates in that they do not state the year's dollars used and the estimates are not properly escalated to convert past dollar values into future dollar values. The Application also fails to indicate how the Applicant will make up any observed shortfalls in its decommissioning fund. Finally, the Applicant should be conservative in estimating the maximum quantity of spent fuel that will be stored at the site.

Basis 5. The decommissioning cost estimate ignores the potential for large accidents and associated contamination of the ISFSI.

Basis 10. The cost estimate fails to justify the basis for the site survey cost in that the estimate does not state the year's dollars used and the estimate is not properly escalated to convert past dollar values into future dollar values.

A. Basis 1 Letter of Credit and Spent Fuel Storage Cask Decommissioning

Q9. What are the decommissioning activities that PFS will fund for the PFSF?

A9. PFS will fund two basic decommissioning activities: First, PFS will fund the decommissioning of the PFSF site. Second, PFS will fund the decommissioning of the spent fuel storage casks that will be used at the PFSF, if needed.

Q10. How will PFS fund the decommissioning of the PFSF site?

A10. For the PFSF site, PFS will use a letter of credit coupled with an external sinking fund into which decommissioning fund payments will be deposited upon collection of funds from PFS customers under the Service Agreements. Prior to beginning of operation, PFS will have obtained a letter of credit equal to 100% of the estimated site decommissioning costs. PFS will collect site decommissioning payments from its customers periodically over the life of the PFSF such that the total amount for decommissioning the site will have been deposited in the external sinking fund by the time all the spent fuel is removed from the PFSF. As the site decommissioning funds are paid into the external sinking fund, the letter of credit may be reduced by an equivalent amount.

Q11. How will PFS ensure that it will have sufficient funds to decommission the spent fuel storage casks?

A11. For the spent fuel storage casks, PFS will prepay the cost of decommissioning each cask into an escrow account prior to the shipment to the PFSF of the spent fuel to be stored in that cask. To cover storage cask decommissioning costs, the Service Agreement will require payment of cask decommissioning costs prior to the shipment to PFSF of the canister to be stored in that cask. These cask decommissioning payments will be deposited by PFS in an external escrow account. The full amount of potential decommissioning costs for each cask will thus be collected in a segregated account prior to the receipt at the facility of the spent fuel canister that will be stored in the cask. This method of funding provides for prepayment of the storage cask decommissioning cost for each cask prior to its operation – i.e., prior to any potential exposure of the storage cask to radiation or radioactive material and therefore prior to the need for any

decommissioning. In my opinion, this funding method complies with the requirements of 10 C.F.R. § 72.30(c)(1), by preparing for the decommissioning of each storage cask prior to its operation.

The Service Agreements will provide that the cask decommissioning cost estimate will be reviewed and adjusted annually to account for inflation and any changes in the estimated cost of decommissioning, as discussed further below.

B. Basis 4 Cost Escalation and Potential Future Deficiencies

Q12. In what year's dollars does PFS provide the estimated costs of decommissioning the PFSF site and the estimated cost of decommissioning each spent fuel storage cask?

A12. The estimated cost of decommissioning the site is stated in 1997 dollars; the estimated cost of decommissioning each cask is also stated in 1997 dollars.

Q13. How will PFS convert its decommissioning cost estimates, which it provided in 1997 dollars, into future year dollars for the purpose of determining in the future whether PFS has an adequately funded decommissioning plan?

A13. The decommissioning cost estimates for the site and the storage casks will be adjusted annually to account for the effects of inflation using the Consumer Price Index, published by the Bureau of Labor Statistics (and as discussed below in response to Question 14 reviewed and adjusted to account for any real changes in the cost of decommissioning the PFSF).

Q14. How will PFS adjust its decommissioning cost estimates to account for any real changes in the cost of decommissioning the PFSF, i.e., how will PFS account for future decommissioning cost changes other than those attributable to changes in the value of the dollar?

A14. Changes in the cost of decommissioning will be accounted for through an annual review of the decommissioning cost estimate to ensure that both the individual elements and the overall estimate remain valid or are revised to account for any changes in the tasks, scope, cost or schedule for decommissioning. This will be provided for in the Service Agreements.

Q15. How will PFS provide sufficient funds for decommissioning in the future if a comparison between the decommissioning cost estimate and present funds indicates a deficit?

A15. Based on the annual review of decommissioning costs, the Letter of Credit will be adjusted to account for any changes in overall site decommissioning costs and for deposits into the external sinking fund. Thus, if PFS needs a letter of credit of greater value to cover site costs, it will obtain one. Further, under the Service Agreements with its customers, PFS will require the customers to make up their proportionate shares of any increase in PFS's site decommissioning costs, on the basis of the portion of the capacity of the PFSF each customer has reserved for spent fuel storage.

PFS will similarly adjust the escrow account for decommissioning the storage casks, as well as future payments into that account, for any deficit in cask decommissioning funds. Again, the Service Agreements with PFS's customers will require the customers to make up their proportionate shares of any such deficit.

Also under the Service Agreement, if any contamination at the PFSF is caused by a customer or anyone acting on the customer's behalf, PFS will clean up the contamination and the customer will be required to immediately pay the cost of cleanup.

Furthermore, it is highly unlikely that a decommissioning funding shortfall will occur. PFS's decommissioning funding plan is conservative in that it does not account for the real rate of return PFS will realize on the money in its decommissioning account over the life of the PFSF. A 2 percent real rate of return (such as allowed by NRC regulations by 10 C.F.R. 50.75) over 40 years would increase the value of the funds by 120 percent before taxes.

Nevertheless, PFS will annually verify its decommissioning cost estimates. If PFS observes a shortfall, customers who have made their decommissioning payments to PFS will be billed for the amount required to make up the shortfall. For customers who have not yet made their decommissioning payments to PFS,

PFS will raise the amounts of the payments to be made so that all costs will be covered. Thus, PFS will ensure that it has sufficient funds to decommission the PFSF site and the spent fuel storage casks.

Q16. How does PFS's decommissioning cost estimate take into account the maximum quantity of spent fuel that will be stored at the PFSF?

A16. As part of its decommissioning funding plan, PFS includes a cost estimate (and will collect monies) to decommission the spent fuel storage cask associated with each spent fuel canister that will be stored at the PFSF. Thus, PFS's decommissioning cost estimate and funding plan for the storage casks directly accounts for the maximum quantity of spent fuel that will be stored at the PFSF. As for the site decommissioning costs, PFS's estimates and the size of its letter of credit are based upon decommissioning of the concrete storage pads predicated on the maximum quantity of spent fuel that could be stored at the PFSF, i.e., 4,000 casks, including estimation of site survey costs based on a full-capacity site.

C. Basis 5 Large Accidents

Q17. How does PFS account for the possibility that a large accident could occur at the PFSF that would contaminate the site and thus increase PFS's decommissioning costs?

A17. PFS does not need to include the cost of accident recovery in its decommissioning cost estimate. The NRC properly treats post-accident cleanup costs as unrelated to decommissioning. Although, the NRC does not require ISFSI licensees under Part 72 to obtain on-site property insurance to cover the potential cost of accident recovery, the potential cost of accident recovery for the PFSF is accounted for by the nuclear property damage insurance PFS has committed to obtaining to cover the facility. The NRC has stated, in the context of nuclear reactors for which on-site property insurance is required, that potential accident recovery costs are not the subject of decommissioning funding:

Assurance of funds for post-accident cleanup is more properly covered by the use of insurance. Post-accident cleanup activities are broader in scope than decommissioning, that is, they can lead ultimately to either reuse [of the facility] or decommissioning. Accordingly, the funding requirements for accident cleanup are not included in [the decommissioning rule] but are contained in 10

CFR 50.54(w) which requires [reactor licensees to] obtain insurance to cover decontamination and cleanup costs associated with onsite property damage resulting from an accident.

Decommissioning Criteria for Nuclear Facilities, Proposed Rule, 50 Fed. Reg. 5,600, 5,606 (1985); see Changes in Property Insurance Requirements for NRC Licensed Nuclear Power Plants, Final Rule, 52 Fed. Reg. 28,963, 28,970-28,971 (1987). Because PFS will have onsite property damage insurance to cover the potential cost of accident recovery at the site, PFS does not need to include the potential cost of accident recovery in its decommissioning funding plan.

D. Basis 10 Site Survey Cost Escalation

Q18. In what year's dollars does PFS provide its site survey cost estimate?

A18. The site survey cost estimate is in 1997 dollars.

Q19. How will PFS account for potential future increases in the cost of the site survey due to inflation?

A19. The decommissioning cost estimate, to include the site survey cost, will be adjusted annually to account for the effects of inflation using the Consumer Price Index, published by the Bureau of Labor Statistics.

Furthermore, as with site decommissioning generally, PFS's funding plan does not take into account the rate of return it will realize on the funds it will collect. A 2 percent real rate of return would increase the value of those funds over the 40 year lifetime of the PFSF by 120 percent before taxes.

Q20. How will PFS account for any real changes in the cost of the site survey for the PFSF, i.e., how will PFS account for future site survey cost changes other than those attributable to changes in the value of the dollar?

A20. Changes in the cost of the site survey will be accounted for as part of the annual review of the entire PFSF decommissioning cost estimate to ensure that both the individual elements and the overall estimate remain valid or are revised to account for any changes in the tasks, scope, cost or schedule for decommissioning.

Attachment 1

Resume of
John D. Parkyn

EXHIBIT 1

P.O. Box C4010
La Crosse, Wisconsin 54602-4010

John Parkyn

Position	Chairman of the Board, Private Fuel Storage, LLC	
Education	University of Wisconsin • Bachelor of Science in Nuclear Engineering	Madison, WI
	United States Army • Certified Reactor Operator	White Sands Missile Range, NM
Nuclear Facility Licenses	Wisconsin Electric Power Company • NRC Licensed Senior Reactor Operator Point Beach Units 1 & 2	Milwaukee, WI
	Dairyland Power Cooperative • NRC Licensed Senior Reactor Operator La Crosse Boiling Water Reactor	La Crosse, WI
Professional Licenses	• Professional Engineer - Wisconsin • Professional Nuclear Engineer - California	
Publications	Author of numerous papers on nuclear energy and its implementation	
Professional Associations	• Past Member, National Planning Committee, American Nuclear Society • Past Chairman, Wisconsin Division, American Nuclear Society	
Positions Held in Nuclear Facilities	• Relief Shift Supervisor • Shift Technical Advisor • Relief Operator • Operations Engineer • Technical Assistant • Assistant Superintendent • Plant Manager • Acting Chief Executive Officer for Nuclear Power (CNO)	

1 MR. SILBERG: And the witness is available
2 for cross-examination.

3 JUDGE BOLLWERK: All right. Ms. Marco?

4 MS. MARCO: I'm going to start with Item B,
5 from then on.

6 CROSS-EXAMINATION

7 BY MS. MARCO:

8 Q. Good morning.

9 A. Good morning.

10 Q. Catherine Marco again.

11 What is the vintage of the data used in the
12 PFS decommissioning cost estimates?

13 A. 1997.

14 Q. And what is the year's dollars of the PFS
15 decommissioning cost estimates?

16 A. 1997.

17 Q. When considering cost escalation, do you
18 intend to restrict adjustment to that within the range
19 of the inflation?

20 A. No.

21 (A discussion was held off the record.)

22 Q. (By Ms. Marco) Do you intend to adjust
23 decommissioning funding?

24 A. We do.

25 Q. And how?

1 A. We intend to do a review on an annual basis
2 of the costs of decommissioning and adjust the funding
3 as necessary to adequately cover it.

4 Q. Would that consider changes in technology?

5 A. Yes, it will.

6 Q. Would it consider changes in regulatory
7 requirements?

8 A. Yes, it will.

9 Q. In your experience how difficult is it for a
10 nuclear entity to secure an increase in a letter of
11 credit which covers decommissioning cost estimates
12 should those estimates increase?

13 A. I don't contemplate that it will be difficult
14 at all.

15 MS. MARCO: We don't have any further
16 questions.

17 JUDGE BOLLWERK: All right. Then
18 cross-examination by the state?

19 CROSS-EXAMINATION

20 BY MS. CHANCELLOR:

21 Q. Good morning, Mr. Parkyn.

22 A. Good morning.

23 Q. Nice to see you back here in Salt Lake.

24 Do you have a copy of your testimony in front
25 of you?

1 A. I do.

2 Q. Okay. In response to Question No. 4, you
3 state that your experience with and base of knowledge
4 regarding decommissioning of nuclear facilities comes
5 from the La Cross Nuclear Power Plant shutdown; is that
6 correct?

7 A. That is correct.

8 Q. And my understanding is that you were at
9 La Crosse dealing with spent -- the disposition of
10 spent nuclear fuel commencing in 1994; is that correct?

11 A. That's correct.

12 Q. And can you tell me how much fuel was
13 involved at the La Crosse site?

14 A. You mean the total fuel that's at the
15 La Crosse site?

16 Q. That's correct, the -- that's right --

17 A. 3 --

18 Q. -- the -- go ahead.

19 A. 333 fuel assemblies.

20 Q. 333 fuel assemblies. And was this a wet
21 storage?

22 A. Yes.

23 Q. And is it still in wet storage?

24 A. Yes.

25 Q. And what was involved in shutting down the

1 La Crosse Nuclear Power Plant?

2 A. Basically you start with the cessation of
3 operations for production of power. You'll also
4 prepare a -- what we call a final decommissioning plan.
5 Remember, this was an earlier era, so we had a
6 preliminary plan that outlined what course of action
7 you intend to take, what staffing you propose to have
8 in place for that and activities like that.

9 Then the next major event is the removal of
10 fuel from the reactor core to the spent fuel storage
11 pool, so you defuel the reactor.

12 And then at some point in there you will
13 receive, per your request from the Nuclear Regulatory
14 Commission, a license to possess but not operate. So
15 now your fuel is out of the core, and you're not
16 authorized to operate the reactor. You can possess the
17 materials, but that's all.

18 And then you move into an era where you begin
19 cleaning, decontaminating, removal of systems and
20 disassembly of the structures.

21 Q. And in terms of timing, the first thing that
22 happened was the decommissioning plan. Approximately
23 when was that either written or approved by NRC --
24 written by you or approved by NRC? I'm not sure where
25 we are in the process with the decommissioning plan.

1 A. By memory, it was submitted in '87, I believe
2 approved in '88. I think it was approximately 12
3 months.

4 Q. And then you mention staffing. Would this be
5 a reduction of staffing or ramping up of staffing for
6 decommissioning?

7 A. It was a reduction in staffing.

8 Q. And approximately what was the reduction?

9 A. There are 82 operating, there's approximately
10 24 in the decommissioning mode.

11 Q. And then there was removal of the fuel from
12 the reactor core to the pool. When did that take
13 place?

14 A. Right after shutdown, 1987.

15 Q. 1987?

16 A. Um-hum. (Affirmative.)

17 Q. And when did La Crosse receive the license to
18 possess but not operate?

19 A. I'm going to guess '88. I don't recall the
20 exact date.

21 Q. That's fine.

22 And the cleaning, decontamination and
23 dismantling, has that occurred at this stage?

24 A. It has been performed regularly by the crew
25 that's there for safe storage of the fuel.

1 Q. And has -- other than the fuel being stored
2 in the pool, has the site been decommissioned, or is
3 that not feasible given that the fuel is still in the
4 pool?

5 A. I guess it depends on the definition of the
6 term "decommission." In other words, there have been
7 site activities in line with decommissioning. Without
8 getting into too much detail on security, basically
9 security jobs were adjusted to reflect the storage of
10 fuel rather than the operating plant, different
11 parameters such as that where -- where a company is
12 site-wise, as well as the removal of systems that were
13 in any way radioactive or contaminated. Much of that
14 has been done.

15 Q. What is the size of the La Crosse plant in
16 acreage or --

17 A. I couldn't tell you a precise acreage.

18 Q. How would it compare to the PFS site in terms
19 of size, acreage size?

20 A. I would say that it's somewhat smaller, more
21 compact.

22 Q. Half?

23 A. Possibly. I -- I don't -- I'm not sure what
24 the acre count was at La Crosse.

25 Q. Has a site survey been done at La Crosse?

1 A. The final release survey? No. There have
2 been limited areas released, including final release on
3 part of the area, but not the entire area, no.

4 Q. You stated in response to a question by
5 Ms. Marco that the vintage of the data for the
6 decommissioning cost is 1997. What do you understand
7 by the term "vintage of the data"?

8 A. That would in my mind be the date for the era
9 in which the work upon which the data was performed was
10 based.

11 Q. The work on which --

12 A. The data was taken from was actually
13 performed, in other words, shipping costs and things
14 like that.

15 Q. And when you say the work on the data, do you
16 mean the date on which -- well, let me back up.

17 Who was it that prepared most of the costs
18 for decommissioning? Was it Stone & Webster?
19 Yourself?

20 A. Myself.

21 Q. Yourself, okay. And what went into the mix
22 of coming up with the 1.6 site decommissioning cost?
23 What categories of data did you look at?

24 A. Well, there were different elements. So far
25 as any shipping or burial of radioactive materials,

1 which is a relatively small increment -- PFS, of
2 course, is much more substantial than at a place like
3 La Crosse which is a power plant -- those were the
4 rates that were in effect, because La Crosse was
5 shipping during that era, is still shipping systems
6 that it's taking out.

7 So far as the amount of labor involved in
8 person hours to do certain tasks, that's the amount of
9 time it was taking them to do those sorts of tasks and
10 keep such records.

11 Q. What do you mean by them, the amount of time
12 it was taking them to do those --

13 A. In other words, where there is a reference to
14 taking a smear survey or wiping something clean, those
15 are the tasks that are done there routinely as part of
16 decommissioning.

17 Q. When you say --

18 A. So I'm just saying the time it was taking to
19 do something and what their pay was in 1997 because
20 that's when they were doing it. I mean they're still
21 doing it. That would be doing it at that time.

22 Q. When you say that and they, are you referring
23 to the personnel at La Crosse --

24 A. Right.

25 Q. -- and what they are doing at La Crosse?

1 A. Right.

2 Q. Okay. And you talked about shipping and
3 burial of radioactive materials. Is that high level
4 nuclear waste, greater than Class C waste? What type
5 of waste are we talking about?

6 A. It wouldn't be greater than Class C waste.

7 Q. It would not?

8 A. No. It would be the materials from
9 decontamination. Recently they shipped a shutdown
10 condenser, which is a major structural component, which
11 has within it a certain amount of contamination.

12 Q. And what facility would you have -- would
13 La Crosse have used for disposal of these radioactive
14 materials?

15 A. Initially they're shipped to Oak Ridge,
16 Tennessee, where they're scanned. There's a vendor
17 there who has very detailed analytical capability to
18 separate contamination from noncontaminated material to
19 a degree that is not normally achievable at sites, a
20 very low background area. That which is radioactive
21 and meets the legal requirements to require burial in a
22 facility was shipped to Barnwell, South Carolina.

23 Q. With respect to the PFS facility, are you
24 aware of what facility would be used to dispose of
25 radioactive materials?

1 A. I believe you're in the compact that uses
2 Hanford, Washington. The Hanford site is what it's
3 called.

4 Q. Do you have any idea of the comparison
5 between the costs of disposal at Barnwell, South
6 Carolina, and the Hanford facility in Washington?

7 A. Currently Hanford is less expensive than
8 Barnwell.

9 Q. Is that taking into account the per annum fee
10 that's charged for disposal at Hanford?

11 A. That was taking the total fees at both
12 places.

13 Q. Including the one-time annual fee for
14 disposal at Hanford?

15 A. I can't respond to that directly.

16 Q. That's fine.

17 A. I think it was.

18 Q. And with respect to the activities that took
19 place at La Crosse with respect to shipping and the
20 labor and time required, what year did that occur at
21 La Crosse?

22 A. You mean the activities -- 1997.

23 Q. They occurred in 1997.

24 And the labor, is that based on the cost of
25 labor at La Crosse, the cost that you used in your

1 decommissioning cost estimates for --

2 A. It was, right.

3 Q. Okay. In response to Questions 13, 14 and 15
4 of your testimony, you state that there are certain
5 reviews and verifications of decommissioning costs that
6 will occur. Do these three answers describe the same
7 single review that takes place each year?

8 A. It was 13, 14 and 15, you said?

9 Q. 13, 14 and 15, that's correct.

10 A. Yes.

11 Q. And could you describe -- and will you be the
12 person doing that review?

13 A. I don't know.

14 Q. Could you describe the procedure for the
15 review?

16 A. Okay. Basically to -- to look at
17 decommissioning costs on an annual basis, you would sit
18 down, again examine your basic premise. So if you had,
19 for instance, a certain labor rate in a certain task,
20 you would then update that labor rate to what you were
21 actually paying in that year.

22 There are certain surveys that are performed,
23 in one case totally independently. This is done
24 through the Nuclear Regulatory Commission. So you
25 would contact firms doing that and ask them what their

1 price would be in that year as opposed to some previous
2 year because those things can change too.

3 You would look at the different elements that
4 you have in there. Of course, in ours it is heavily
5 weighted towards labor, so it would be very labor
6 dominant as to what your wage rates were that you were
7 paying people relative to the preceding year.

8 And so then you would also look at what's
9 called new technology. If someone would come along
10 with a better way to clean something, you know, that
11 would do a more thorough job, a better way to measure
12 something, then you would evaluate the cost of that in
13 there, and if that was, in fact, a better way, you
14 would include that in there.

15 That might be something as simple as the type
16 of detectors that are used to measure residual
17 radioactivity. They're constantly getting better. Or
18 it could be a new type of cleaning technique.

19 So then basically you put those together to
20 replicate your original process of what you're going to
21 do to decommission, but now you have this year's
22 dollars in, and then next year you do the whole
23 exercise again to make sure that it grows with changes.

24 Q. So your starting premise would be the
25 existing plan that you have from the 1997 data; is that

1 correct?

2 A. That's correct.

3 Q. And how would you find out or keep abreast of
4 whether there was any new technology?

5 A. That's pretty readily available. One thing
6 we've always encouraged at La Crosse and certainly will
7 at the PFS site is that our staff are members of their
8 professional associations.

9 PFS is already active in the American Nuclear
10 Society, and they twice a year hold very extensive
11 conferences that are technology devoted. So if your
12 orientation is health physics, which is an area that
13 has had a lot of advances in decommissioning, you would
14 not only have your health physicists attend this, but
15 you would have them bring back papers that are
16 presented. There's usually a printed handout of a
17 paper, and they will discuss new techniques.

18 There are also pretty extensive once-a-year
19 vendor displays in which each vendor has brought
20 something out that is new. And that's not just
21 decommissioning, but that's one of their strong points.
22 They would have actual samples of it there on display
23 and be able to tell you what it would cost to buy. So
24 there's very good communication within the technology
25 community of advances that are being made.

1 They also have, of course, papers by persons
2 working at national labs and universities of things
3 coming down the road that may not yet be in the
4 hardware form.

5 So if you ensure that your staff is in
6 attendance at such activities and hopefully does some
7 of their own research work and presents that, then they
8 have good networking to keep abreast of everything
9 that's coming and what's been developed to a point
10 where, you know, it's available and you could actually
11 use it.

12 Q. In PFS's license application, there's a
13 statement that PFS will increase costs based on the
14 Consumer Price Index; is that correct?

15 A. That's true. It's in there.

16 Q. And is it also true that PFS will increase
17 costs based on changes in the underlying data,
18 increases based -- strike that.

19 Is it also true that PFS will increase its
20 decommissioning funds based on a change in the -- in
21 the data that underlies the cost? For example, if
22 labor costs go up, is PFS committing to increase its
23 funding if labor costs go up by more, say, than the
24 Consumer Price Index?

25 A. Definitely.

1 Q. And also, is PFS committing to increase
2 funding based on new technology it could employ at the
3 site that may be more expensive?

4 A. Yes.

5 Q. Now, Mr. Parkyn, in response to
6 Question 15 -- on page 6 is your answer -- it states
7 here, and I quote, If PFS needs a letter of credit of
8 greater value to cover site costs, it will obtain one,
9 close quote.

10 Can you explain whether or not the bank from
11 which PFS has obtained a letter of credit has made any
12 commitment or is under any obligation to increase the
13 letter of credit that it has issued to PFS?

14 A. I guess my response would be that the
15 understanding at the time the commitment was made was
16 that that was in, so to speak, current dollars, so the
17 analysis done was really in whether they would grant a
18 letter of credit or not more so than the amount. And
19 so after considering PFS and reviewing PFS, their
20 decision was to grant a letter of credit. The
21 understanding is that by the time the facility goes to
22 operation, that will be a larger amount, and they
23 didn't have a difficulty with that. Obviously, you
24 can't calculate the amount if you're trying to take
25 into account actual wages and new technologies until

1 you're at that point, but they indicated a willingness
2 to put in the necessary letter of credit. The amount
3 listed was the amount at that point, and they did
4 respond to that.

5 Q. So the amount listed is 1.6 in 1997 dollars;
6 is that correct?

7 A. That's correct.

8 Q. And when you say that the understanding was,
9 what do you mean by understanding? Whose understanding
10 and what does that mean?

11 A. Well, basically their senior loan officer's
12 presentation to the board and approval of it was that,
13 you know, we've reviewed this and we're willing to
14 grant a letter of credit to Private Fuel Storage for
15 decommissioning funding at the time they operate. Now,
16 currently the cost of that is, and it was outlined, but
17 it was also explained that will escalate by undoubtedly
18 at least inflation. So when they accepted that
19 commitment, that's what they accepted, the fact that
20 the letter of credit would be at least this amount in
21 1997 dollars, but in actual dollars in the year
22 executed, it would be a higher amount. And they were
23 willing to do that.

24 Q. And the they is the River Bank in La Crosse?

25 A. That's correct.

1 Q. In the letter of credit language that --
2 draft letter of credit or the proposed language of the
3 letter of credit, I don't believe that there's anything
4 in the letter of credit that talks about an
5 understanding or a commitment to issue the letter of
6 credit based on 1.6 million in 1997 dollars escalated
7 to current year dollars; is that correct?

8 A. I don't have it in front of me.

9 Q. I don't either. I'll come back to that
10 later, Mr. Parkyn, if we can find the language of the
11 letter of credit.

12 Do you know what factors would affect whether
13 or not the bank would be willing to increase the letter
14 of credit if, say, five years, ten years into the
15 project, PFS needed to obtain a larger letter of credit
16 from the bank?

17 A. Well, the only factor I can think of is that
18 PFS is -- remains a viable entity with a similar credit
19 stance as it did at the time that they made the
20 commitment for the amount that was listed.

21 Q. And what would you consider PFS's credit
22 stance to be?

23 A. Well, at the time this was listed, basically
24 PFS was current on its -- its bills, which it is --
25 remains so since. PFS had no known short-term debt

1 that was used to replace equity, so it was, in effect,
2 a debt-free entity.

3 Q. And isn't it also true that PFS has no
4 assets?

5 A. I guess it would depend on your definition of
6 assets.

7 Q. What assets under your definition do you
8 think that PFS has or had at the time that it went to
9 the bank to obtain the letter of credit?

10 A. Well, currently, of course, it has a pending
11 license application. It has a lease that could be
12 utilized if the license is granted. It has certain
13 technology. PFS has worked with the American
14 Association of Railroads in shipping spent nuclear fuel
15 which has, of course, advanced the standards
16 considerably there. There is a design for a railcar to
17 be used for that purpose, and ownership of that design
18 belongs to PFS.

19 Q. Has that been patented?

20 A. It hasn't been patented at this point, no.

21 Q. What would you consider to be the fair market
22 value of PFS's current assets?

23 A. I couldn't answer that one without looking at
24 them.

25 Q. What would you need to look at?

1 A. I guess I would have to step back and try to
2 do such a calculation. I've never done one.

3 Q. Does PFS do financial statements?

4 A. Not on a value and asset like that.

5 Q. You don't prepare a balance sheet?

6 A. Not that calculates the license as an asset,
7 no. Just a balance sheet of cash expenditures.

8 Q. So you have a balance sheet based on expenses
9 and income?

10 A. Correct.

11 Q. It's an income and expense statement as
12 opposed to a balance sheet, right, where you list all
13 your assets?

14 A. Sure, um-hum. (Affirmative.)

15 Q. Not including the -- the pending license
16 application -- which is not a license yet, correct?

17 A. That's correct.

18 Q. Not including the license application, can
19 you give a ballpark estimate of PFS's current assets?

20 A. I couldn't by memory. You know, one would,
21 as I say, have to value the design work that's been
22 done.

23 [Pause.]

24 Q. Does PFS have audited statements of its
25 financial records?

1 A. It does have financial records that were
2 audited, yes.

3 Q. Do you know the value of PFS's assets for
4 financial reporting requirements?

5 A. No, I don't.

6 Q. Okay. What is the fee for the current letter
7 of credit?

8 A. There is no current letter of credit so there
9 is no fee.

10 Q. Oh. What will be the fee for the letter of
11 credit when it is issued upon licensing of PFS?

12 A. In the range of zero to 2 percent, most
13 likely 1 percent.

14 Q. And zero to 2 percent, is that typical for
15 the fee that is applicable to a letter of credit?

16 A. That's the range the bank has used over its
17 operating history.

18 Q. And would you expect this zero to 2 percent
19 to be the fee applicable to any increase in the letter
20 of credit?

21 A. Yes.

22 Q. And would you expect that to be 1 percent
23 like your initial fee?

24 A. Yes.

25 Q. And in terms of construction, operation and

1 maintenance and decommissioning, in what one of those
2 three categories would you place the fee for the letter
3 of credit?

4 MR. SILBERG: Mr. Chairman, I just would ask
5 a question as to which of the bases of this contention
6 this question relates to. I think we're getting
7 somewhat afield.

8 MS. CHANCELLOR: Your Honor, it goes to
9 whether PFS can actually increase its letter of credit.
10 Mr. Parkyn has testified that if it needs a letter of
11 credit, it will get one, if it needs an increase in the
12 letter of credit, it will obtain one. And Basis 4
13 states that the decommissioning plan must compare the
14 cost of present funds, and if there is a deficit in
15 present funding, the plan must indicate the means of
16 providing sufficient funds for completion of
17 decommissioning.

18 So where I'm going is the -- the reasonable
19 assurance that PFS has of providing in the future
20 sufficient funding for completion of decommissioning.

21 So it goes to Basis 4, Mr. Silberg.

22 MR. SILBERG: Thank you.

23 Q. (By Ms. Chancellor) So what category --
24 where would you place the cost for the letter of
25 credit, what category, construction, operation and

1 maintenance or decommissioning costs?

2 A. It's in the operation and maintenance costs.

3 MS. CHANCELLOR: Okay. I have one copy of
4 the letter of credit dated April 28th from River Bank,
5 Wisconsin -- La Crosse, I mean. If I could approach
6 the witness, Your Honor, I just have the one copy.

7 JUDGE BOLLWERK: All right.

8 Q. (By Ms. Chancellor) Now I need to remember
9 my questions.

10 You have in front of you, Mr. Parkyn, the
11 proposed language of the letter of credit that the
12 River Bank of Wisconsin will issue to PFS; is that
13 correct?

14 A. That's correct.

15 Q. And can you point to any language in that
16 letter of credit which states that the River Bank will
17 issue the letter of credit based on 2000 year --
18 1.6 million based on 2000 -- based on dollars in which
19 the -- strike that.

20 I notice that the letter of credit is in the
21 amount of 1.7 million; is that correct?

22 A. That's correct.

23 Q. And what year's dollars is that?

24 A. 1997.

25 Q. And the letter from River Bank is dated 1998;

1 is that correct?

2 A. That's correct.

3 Q. What date was that?

4 A. April 28, 1998.

5 Q. And is there any language in the letter of
6 credit that states that the 1.7 million will be
7 escalated to current year's dollars in the year in
8 which the letter of credit is needed?

9 A. Not specifically in the letter of credit, no.

10 Q. Is there anything in either the cover letter
11 or the language of the letter of credit that commits
12 the bank to increasing the amount of the letter of
13 credit above the \$1.7 million?

14 A. Not in the cover letter or the draft letter
15 of credit, no.

16 Q. Thank you.

17 Could I get that back from you? It's my only
18 copy.

19 A. Yeah.

20 JUDGE BOLLWERK: Just for the record, you're
21 not planning on marking that, are you?

22 MS. CHANCELLOR: No, I'm not.

23 JUDGE BOLLWERK: All right.

24 Q. (By Ms. Chancellor) Isn't it correct that
25 the letter of credit is not an insurance policy?

1 A. It doesn't appear to be an insurance policy,
2 no.

3 Q. Isn't it correct that if the bank pays out or
4 advances money on the letter of credit on behalf of PFS
5 that PFS must repay the bank whatever amounts the bank
6 has advanced on behalf of PFS?

7 A. Yes.

8 Q. Mr. Parkyn, isn't it true that you are on the
9 A Board of the River Bank -- I don't remember which
10 board, but --

11 A. I'm on the board of directors.

12 Q. And how long do you anticipate that you'll
13 hold that position?

14 A. There's no limit specifically. As long as
15 they wish me to be on the board.

16 Q. Do you anticipate that you'll be there in 20
17 years' time, at the end of PFS's first license term?

18 A. Probably not, considering my age. It's
19 potential but --

20 Q. I won't ask you about the 40 years, then.

21 A. May I clarify a response?

22 Q. Certainly.

23 A. The letter of credit, remember, is merely in
24 place until the money has been collected by the
25 payments of the first user of the site. So the

1 contemplated length of time of the letter of credit
2 being in place is only approximately two years.

3 Q. If, for example, there was a significant
4 increase in decommissioning costs after you had retired
5 the letter of credit, would those costs, then, be
6 covered by another letter of credit?

7 A. Those costs would be paid -- covered by
8 payments from users because you would have escalated
9 the decommissioning costs presumably in your annual
10 review, which I guess is what you're talking about.

11 Q. In response to Question 15, page 6,
12 paragraph 1, in the last sentence there you state that
13 PFS will require customers to pay their proportionate
14 share of increase in site decommissioning; is that
15 correct?

16 A. Yes.

17 Q. And will such a requirement be part of the
18 terms and conditions of the service agreement?

19 A. It will.

20 Q. And will those terms and conditions in the
21 service agreement be the same for each and every
22 customer at PFS?

23 A. Yes.

24 Q. Have those specific terms and conditions been
25 drafted yet?

1 A. We're currently drafting the final version of
2 the service agreement.

3 Q. And on page 6, in paragraph 2 of page 6, if
4 there's a deficit in cask decommissioning funds, of
5 storage cask funds, those will also be passed through
6 to customers; is that correct?

7 A. That's correct.

8 Q. And that would also be under the service
9 agreement?

10 A. Yes.

11 Q. And would those terms and conditions be the
12 same for each and every customer?

13 A. Yes.

14 Q. And page 6, paragraph 3, you state that if
15 any contamination of the PFS facility -- I can't say
16 PFSF. It's sort of a mouthful -- if any contamination
17 of the PFS facility is caused by a customer or anyone
18 acting on the customer's behalf, PFS will clean up the
19 contamination and the customer will be required to
20 immediately pay the cost of cleanup.

21 That would occur under the service agreement;
22 is that correct?

23 A. Yes.

24 Q. And PFS's initial costs of cleaning up the
25 contamination, would that be an operations and

1 maintenance cost in the first instance?

2 A. It would, in fact, be site labor, but the
3 basic terms of the service agreement are that they will
4 immediately pay us back. So the intent is not to have
5 to draw on the letter of credit and wait for them to
6 pay us back but bill them immediately and, of course,
7 record any such costs, if -- if such contamination
8 would occur, down to the person hour involved cleaning
9 it up, anything that was used to clean it up. And then
10 under the terms of the service agreement, the customer
11 is required to pay that amount immediately. So it
12 would be an allocation in the sense of operating and
13 maintenance hours that would be paid back as an extra
14 revenue to offset it into operations and maintenance.

15 Q. And, again, would the terms and conditions of
16 the service agreement be the same for each and every
17 PFS customer with respect to contamination?

18 A. Definitely.

19 Q. And what is PFS's intention for cleaning up
20 contamination if PFS cannot trace the contamination
21 back to a specific customer?

22 A. We don't contemplate a case occurring as
23 there will be a survey done with each receipt, so
24 contamination will be located as the cask or canister
25 is incoming and will be assigned immediately at that

1 point. The costs, then, would be determined in the
2 subsequent cleanup, but the assignment of where the
3 contamination came from would be done immediately upon
4 measurement of it.

5 Q. So if there were an earthquake, how would you
6 measure where the contamination came from if -- let me
7 tie that one together. If there were an earthquake
8 that affected a significant number of casks stored at
9 PFS and caused contamination, how would you measure
10 where the contamination came from?

11 A. That is an accidental situation that would be
12 covered by property insurance. Therefore, we wouldn't
13 be required to tie it to which customer the
14 contamination came from. That wouldn't be under
15 decommissioning, or decontamination and
16 decommissioning.

17 Q. What if there was an event from a military
18 training exercise that caused damage to casks, how
19 would PFS apportion cost in that instance?

20 A. It would not have to because the responsible
21 party for that would be the federal government.

22 Q. And do you believe that the federal
23 government would be able -- if the federal government
24 invoked sovereign immunity, what would PFS -- what
25 contingent plans would PFS look to?

1 MR. SILBERG: Objection. Calls for a legal
2 conclusion. The Federal Tort Claims Act speaks for
3 itself as a waiver of sovereign immunity.

4 MS. CHANCELLOR: I'll rephrase the question.

5 Q. To the extent that the federal government is
6 slow in paying, which it is -- which is not an
7 unreasonable assumption, what funds would PFS use in
8 the first instance to clean up any contamination caused
9 by -- that may be caused by military activities
10 occurring -- military activities?

11 A. Your initial source of funds, of course, is
12 your insurance carrier who then proceeds against the
13 party that caused the event, in this case, the federal
14 government, and recoups them from the government. So
15 your principal is your property -- nuclear property
16 insurance.

17 Q. Isn't it true that PFS is located under the
18 Sevier B Military Operating Area for the Utah Test &
19 Training Range?

20 A. I believe it is.

21 Q. Isn't it true that cruise missile and other
22 military training and testing exercises can occur in
23 the military operating area?

24 MR. SILBERG: I think we're going beyond the
25 scope of this testimony. The state will have --

1 MS. CHANCELLOR: Mr. Parkyn --

2 MR. SILBERG: Excuse me. The state will have
3 an ample opportunity to discuss this when we get to
4 Utah K.

5 MS. CHANCELLOR: Mr. Parkyn has testified
6 that if there's -- if there's a contamination caused by
7 military activity, he will look to the nuclear
8 insurance policy. The nuclear insurance policy has
9 exclusions. That's what I'm getting at.

10 MR. SILBERG: Why don't you ask that
11 question?

12 MS. CHANCELLOR: If you'll give me time, I
13 would like to set it up. Thank you.

14 MR. SILBERG: I think the definition of what
15 kind of military activities are taking place where is
16 well beyond the scope of this testimony. My objection
17 stands.

18 MS. CHANCELLOR: It depends on -- if
19 Mr. Parkyn is relying on the insurance policy, then
20 I -- then it is reasonable to inquire into what he
21 understands may be covered by the insurance policy.

22 MR. SILBERG: Perhaps this would be a good
23 time to put into evidence a letter that I previously
24 distributed to the parties regarding the scope of the
25 war risk exclusion in the insurance policy. With the

1 parties' leave, I'd be happy to do that.

2 MS. CHANCELLOR: I'd prefer to wait for
3 redirect for that, Your Honor.

4 JUDGE BOLLWERK: I'm going to allow the
5 question, but I want to keep this under control. This
6 is about decommissioning costs, and I'm concerned that
7 it is going in a direction that is going to get us way
8 beyond the scope of what we're dealing with here,
9 especially since it appears that we're going to be
10 dealing with this question on rebuttal anyway.

11 You may need to reask him the question.

12 MS. CHANCELLOR: Could you read back a number
13 of questions back what the question was to Mr. Parkyn?

14 (The question was read.)

15 MS. CHANCELLOR: Mr. Silberg is making
16 gestures to Mr. Parkyn. I don't quite understand
17 what's going on.

18 MR. SILBERG: Mr. Parkyn wanted to know
19 whether he should answer the question.

20 JUDGE BOLLWERK: And the answer to that is,
21 yes, sir.

22 THE WITNESS: Yeah, I've been trying to
23 follow this process, so if the answer is that I'm to
24 answer the question, or the result is, am I aware that
25 there's military overflights? Certainly. I've been

1 out there and seen them. Am I aware that there's
2 cruise missile testing? I know that there are great
3 restrictions on cruise missile testing. I am a pilot,
4 and I know what some of those restrictions are.
5 Whether cruise missiles are tested over the site, I
6 don't know specifically. I know that cruise missile
7 tests that have been in the press recently have
8 emphasized heavily that such cruise missiles are not
9 armed.

10 So that's the extent of my knowledge of how
11 much military action occurs in this flyway. Again,
12 that's covered by our property insurance, not by
13 decommissioning.

14 Q. (By Ms. Chancellor) With respect to the
15 service agreements, Mr. Parkyn, what is the termination
16 date of the service agreements? What do you anticipate
17 will be the termination date of each service agreement?

18 A. Service agreements will have to cover the
19 entire period in which a customer would have any fuel
20 at the facility, plus any ultimate decommissioning of
21 the facility if their fuel had left at an earlier date.

22 Q. So would the service agreements run -- would
23 the term of the service agreement extend beyond the
24 date on which the site was finally -- was completely
25 decommissioned?

1 A. I wouldn't contemplate that they would run
2 beyond the date in which the license were terminated.
3 There's different steps of decommissioning, but if by
4 final decommissioning you mean removal of all material
5 from site, radioactive material, should there be any,
6 and then the final survey required by the Nuclear
7 Regulatory Commission before they release the site and
8 terminate a license, I would say that the service
9 agreements would reach out that far. After that there
10 are no more PFS operations contemplated. That would
11 probably be the end of the service agreement term.

12 Q. Who is it that approves the materials -- in
13 the PFS structure, who is it in the PFS structure that
14 approves the terms and conditions of the service
15 agreements?

16 A. The Board of Managers.

17 Q. And how many members of the PFS consortium
18 are on the Board of Managers?

19 A. Each one.

20 Q. And for -- and for -- let me back up.

21 Will the service agreements contain common
22 terms and conditions?

23 A. Is your question will some of the terms be
24 common to all of them?

25 Q. That's correct. That's a better way of

1 putting it.

2 A. Definitely, yeah.

3 Q. And will some of the terms and conditions be
4 individually negotiated with each customer?

5 A. Some of them will, delivery dates and things
6 like that certainly.

7 Q. What other types of conditions will be
8 individually negotiated with an individual customer?

9 A. At this point, while it has been discussed,
10 say, individuals, the board has not selected any that
11 would be individually negotiated. The pricing
12 structure, of course, is in the service agreement, but
13 as I said, delivery dates and usage are in that sense
14 negotiated. That's all we've really come up with at
15 this point as something that would be individually
16 negotiated.

17 Q. And in terms of these various pass-through
18 costs to PFS customers such as their proportionate
19 share in the increase of site decommissioning, those
20 pass-through costs, do they have to be approved by the
21 Board of Managers?

22 MR. SILBERG: Excuse me. Just for
23 clarification, do you mean the types of costs that will
24 be passed through? Is that what your question was
25 going to?

1 MS. CHANCELLOR: Yes.

2 Q. Not each and every individual bill that's
3 sent out but the category of cost that is -- the
4 category that is -- of cost that is passed through to
5 customers, does that in the first instance require
6 approval by the Board of Managers?

7 A. If you're thinking of -- you know, the -- in
8 the global sense of the word, they approve the budget,
9 obviously, and the budget is updated to reflect new
10 operating costs each year. So by approving the
11 expenditure, they're approving passing it through. But
12 item by item, I don't contemplate that, you know, the
13 board would interfere with the operating staff to that
14 degree. They would come in, outline what their budget
15 would be for the next year that presumably would be
16 higher because costs do go up, and it would be the
17 responsibility of the Board of Managers to approve
18 their budget, which would then trigger automatically
19 the pass-through to customers.

20 Q. Now, you're going to have to help me out on
21 this a little, Mr. Parkyn. You stated that the board,
22 by approving the budget, would also be approving
23 expenditures, and ergo, that they are approving the
24 pass-through costs to the customer. Would PFS in its
25 budget have as a line item the expense that PFS in the

1 first instance would incur? Is that correct? For
2 example, an increase in the annual review -- increase
3 in costs that will be billed to the customers based on
4 the annual review that PFS intends to conduct, how
5 would those increased costs be reflected in the budget?

6 MR. SILBERG: Excuse me. Just for
7 clarification, the annual review you're talking about
8 is the annual review of the decommissioning costs?

9 MS. CHANCELLOR: That's correct.

10 THE WITNESS: That would depend on what
11 category they fell in. Going back to your earlier
12 questions, during those first few years when there is a
13 letter of credit in place because all of the
14 decommission had not been escrowed, annual review of
15 decommissioning costs that raise the 1.6 whatever it is
16 million, the nominal 1.7, to something else would then
17 be reflected automatically in an increase in the letter
18 of credit which I mentioned previously is in the O&M
19 costs. So that would be passed through to the
20 customers.

21 Should the annual review of decommissioning
22 costs derive a higher cost of decommissioning a
23 canister overpack should it be ever contaminated, then
24 that, through the service agreement, allows you
25 basically to go back and collect any escalation if your

1 investments haven't covered it. Remember, the
2 decommissioning for the casks -- overpacks is collected
3 a hundred percent in advance, so the only occasion in
4 which you would need to go back would be if the
5 investment income, because you got all the money ahead
6 of time and put in an external fund, was not adequate
7 to keep up with the amount of your new estimate on an
8 annual basis of what that cleanup would cost. If
9 there's a shortfall, then you would bill your
10 customers.

11 Q. (By Ms. Chancellor) And would the Board of
12 Managers as a -- as a sort of a general proposition,
13 would the Board of Managers be required to approve
14 increases in pass-through costs to PFS customers?

15 A. Looking at it, I doubt that it would be
16 required at the board level, other than the global
17 budget that we're talking about. So if the annual
18 decommissioning produced a requirement to back-bill
19 someone who had already shipped fuel because the amount
20 of money paid to decommission an overpack or a storage
21 canister turned out to be inadequate in the annual
22 update, then I believe the way the service agreements
23 will be written will basically authorize simply sending
24 them a bill. I don't believe the board's got to vote
25 on that.

1 Q. But, for example, if the fee for the letter
2 of credit were increased, that would be part of PFS's
3 budget that it submits to the Board of Managers; is
4 that correct?

5 A. That's correct.

6 Q. So to the extent that an item is in the
7 budget that is submitted to the Board of Managers, it
8 would require the Board of Managers' approval?

9 A. That's correct.

10 [Pause.]

11 MS. CHANCELLOR: Getting questions from all
12 sides here, Your Honor.

13 Q. When you say that coverage of decommissioning
14 cost increases will be included in the service
15 agreements, has that been decided by the Board of
16 Managers?

17 A. Yes.

18 Q. With respect to the cost of the letter of
19 credit, the approximate 1-percent cost of the letter of
20 credit, is that 1 percent forever over the term of the
21 letter of credit or 1 percent per annum?

22 A. The letter of credit, remember, was described
23 as one that is reduced as the money is collected and
24 escrowed. So the amount of the letter of credit would
25 be contemplated to go down as it was offset by cash

1 deposits. So basically the 1 percent would be read as
2 a fee on the balance of the actual letter of credit
3 which would diminish as cash replaced the letter of
4 credit.

5 Q. The 1-percent fee on whatever the balance the
6 letter of credit is, is that 1-percent fee paid just on
7 the initial issuance of the letter of credit or, if you
8 extend the letter of credit to the second year, is
9 there a second 1-percent fee paid on whatever the
10 balance is in the second year, continuing on through
11 the longevity of the letter of credit?

12 A. The second, that's the way it's done
13 basically.

14 Q. The second --

15 A. Your second description --

16 Q. Okay.

17 A. -- where you would pay -- you're basically
18 paying 1 percent a year for a letter of credit. So if
19 it stayed at the same amount, obviously that would be
20 the same dollar amount, but when you have a diminishing
21 one like this, then your bill for a subsequent year
22 would only be 1 percent of what's left. In other
23 words, as you put cash in a separate escrow account for
24 decommissioning, you would be notifying the bank that,
25 you know, on such and such a date we would not need any

1 longer that part of the letter of credit because we
2 actually have the cash in hand.

3 Q. Would customers whose fuel has long gone also
4 be billed for increases in decommissioning costs?

5 A. Yes.

6 Q. And if the amount collected for radiological
7 decommissioning is inadequate, will PFS use the amount
8 collected for nonradiological decommissioning to make
9 up for any shortfall that it -- in radiological
10 decommissioning?

11 A. Let me ask for a clarification. You're
12 asking if we have money for nonradiological
13 decommissioning in excess of our needs, which is what
14 we're collecting, would we then use that for
15 radiological decommissioning?

16 Q. That's correct, yes.

17 A. Definitely.

18 Q. You stated earlier in response to a question
19 that the delivery dates and usage of the PFS site by
20 customers will be individually negotiated. What does
21 the term "usage" mean?

22 A. Okay. That's I guess my reference to using
23 the site, in other words, when they actually had fuel
24 at the site.

25 Q. As opposed to one year prior to delivery and

1 a committed delivery date?

2 A. Well, what you're doing there is you're --
3 yes, you're triggering the payments you talked about
4 previously. So you would individually negotiate with a
5 customer how much fuel they wanted to place there in a
6 certain year and how long it would remain. So, in
7 theory, they could have a terminus date by which they
8 would want to take it out. So in that sense, it's
9 individualized as to when a given customer would want
10 to ship to the facility.

11 Q. And when you say triggering a payment, is
12 that the third base payment?

13 A. It's the second and the third.

14 Q. Second and the third?

15 A. Remember, those two are tied to when the
16 facility's used. The first one is tied to when it was
17 constructed.

18 Q. And the second and third base payments, are
19 they both due at the same time?

20 A. No. The second base payment is due roughly a
21 year and a half prior to when the fuel is shipped. The
22 third base payment is due a period of days ahead. We
23 have to have it in receipt before the fuel could leave
24 the reactor site.

25 Q. In terms of the term or period of the service

1 agreement, what do you anticipate would be the longest
2 term or period that a service agreement would be in
3 existence for?

4 A. Well, I would contemplate, again, going back
5 to my previous question, that from the time it is
6 signed, the responsibility for the facility up until
7 its delicensing, its ceasing to exist as a facility,
8 would, in effect, cover most of the service agreements
9 certainly that would be signed before construction
10 because they would all cover that period.

11 Q. So there wouldn't be service agreements, say,
12 for five years which would be renegotiated at the end
13 of a five-year period?

14 A. That's correct. The only way you could have
15 that short a service agreement is if you shipped in the
16 last year or two of the facility.

17 Q. With respect to usage of the site,
18 Mr. Parkyn, what would you contemplate would be the
19 longest period of time for a customer to contract to
20 leave its fuel on site at PFS?

21 MR. SILBERG: Mr. Chairman, again, I would
22 object because I don't see how these questions -- and
23 I've let a lot of questions go by that I wasn't sure I
24 understood how they related, but at some point I just
25 don't see how this relates to Mr. Parkyn's testimony or

1 this contention.

2 MS. CHANCELLOR: Your Honor, this relates to
3 whether we're looking at a 20-year license or a 20-year
4 plus a renewal of a 20-year license. So whether the
5 service agreement is written in terms of actual years
6 or the license termination date, we have no idea how
7 these service agreements work, so we're trying to
8 figure out what -- whether Mr. Parkyn's decommissioning
9 will work for a 20-year facility, which is the license
10 term that PFS is applying for currently.

11 JUDGE BOLLWERK: All right. I'm going to
12 allow the question, although I don't see where exactly
13 this is going. But -- what -- all right. Ask him the
14 question.

15 Q. (By Ms. Chancellor) What's the longest
16 period for which you contemplate contracting for
17 on-site storage of spent fuel from a customer?

18 A. I guess you're asking in terms of
19 decommissioning. We're collecting all of that on the
20 same basis prior to shipment of fuel anyway, so it's
21 not variable in any way as to how long a customer would
22 leave fuel there for. You know, the presumption is
23 that there's a certain amount that must be paid for
24 decommissioning, and you have to pay a hundred percent
25 of it in advance of shipping the fuel irregardless of

1 how long you want to have it there.

2 Q. That didn't quite get at my question which
3 was what is the longest period of time you contemplate
4 under a service agreement that the customer would be
5 able to store fuel at the PFS site?

6 MR. SILBERG: Mr. Chairman, I think that's
7 asked and answered. The witness testified that the
8 service agreements would extend until the period that
9 the license has been terminated.

10 JUDGE BOLLWERK: He did testify to that. Is
11 there a different question you want to ask him?

12 MS. CHANCELLOR: If Mr. Parkyn can verify
13 that usage of the site is synonymous with -- let me
14 strike that.

15 If -- what I'm trying to understand is
16 whether the service agreement is written -- how the
17 service agreement is written in terms of usage of the
18 site, and if Mr. Parkyn wants to reiterate his response
19 to another question that -- that usage and apply that
20 to usage at the site, that will certainly satisfy my --

21 MR. SILBERG: I'm going to object. I think
22 the question has been asked and answered certainly with
23 respect to decommissioning. As it relates to other
24 things, it's outside the scope of this contention.

25 [Pause.]

1 Q. (By Ms. Chancellor) With respect to
2 accidents, Mr. Parkyn, you state that accidents are
3 unrelated to decommissioning; is that correct?

4 A. I stated that the cost of recovery from
5 accidents is covered by the nuclear property insurance
6 policy, not by decommissioning funding.

7 Q. And if a cost weren't covered by your
8 insurance policy, would that be a decommissioning cost?
9 If an accident cost were not covered by insurance,
10 would that be a decommissioning cost?

11 A. It would be a cost. I don't know that it
12 would specifically be a decommissioning cost.

13 Q. Would it be an operations and maintenance
14 cost?

15 A. I don't contemplate such an event happening,
16 so I think it's probably irrelevant what you would
17 classify it. It would be a cost.

18 Q. If an accident were to occur while PFS were
19 decommissioning the site, then how would the costs be
20 covered?

21 A. Maybe we need to redefine decommissioning.
22 Remember, decommissioning, as you've pointed out, has
23 two elements. One is the site and one is the overpacks
24 or storage casks. And, of course, decommissioning
25 begins once all shipments start to the U.S. Department

1 of Energy. So as you reach the end of life of the
2 facility, we are looking at its final decommissioning
3 of the site. You have very few overpacks left. So
4 your decommissioning has gone on for quite a period of
5 years, therefore, what's left to decommission is
6 progressively smaller as you get towards the end of
7 life of the facility. If something occurred to raise
8 the cost of decommissioning, those costs are passed on.

9 Q. And they're passed on because the term of the
10 service agreement continues after the fuel leaves the
11 site; is that correct?

12 A. Until the decommissioning is completed and
13 the license is terminated by the Nuclear Regulatory
14 Commission.

15 Q. With respect to the overpacks or the storage
16 casks, isn't it correct that PFS intends to reuse the
17 storage casks?

18 A. If a shipment outbound occurs at a time in
19 which a shipment inbound is still coming, we will
20 certainly reuse those rather than make multiples of
21 them.

22 Q. Is that at the customer's discretion or is
23 that part of the requirement for storing fuel at PFS,
24 that, if possible, storage casks will be reused?

25 A. It's a PFS decision. The customer pays the

1 full amount regardless.

2 Q. The customer pays the full amount regardless
3 of whether they get a used storage cask or a new one?

4 A. Precisely.

5 MS. CHANCELLOR: No further questions, Your
6 Honor.

7 Thank you, Mr. Parkyn.

8 JUDGE BOLLWERK: Do you want to try redirect
9 or do you want to --

10 MR. SILBERG: I would like to take a break.

11 JUDGE BOLLWERK: All right. Why don't we
12 take a ten-minute break, and then we'll come back for
13 redirect.

14 (A recess was taken.)

15 JUDGE BOLLWERK: Why don't we come back to
16 order, please. All right. We're back on the record
17 after our break, and I believe PFS redirect for
18 Mr. Parkyn.

19 REDIRECT EXAMINATION

20 BY MR. SILBERG:

21 Q. Yes, I have just a very few questions.
22 Mr. Parkyn, you were asked a question about whether
23 your estimate of low-level waste disposal cost for
24 Hanford included a onetime fee. Have you gone back and
25 determined whether your Hanford costs included that

1 fee, and if so, whether the Hanford costs remained less
2 expensive than the Barnwell costs?

3 A. Yes, it included all the costs; and yes, they
4 are considerably less per cubic foot than Barnwell.

5 Q. And just -- I'm not sure the record is
6 completely clear on this. With respect to the pricing
7 structure in the service agreements, will those aspects
8 of the service agreements be individually negotiated?

9 A. The aspects having to do with
10 decommissioning?

11 Q. No, no, the pricing structure. I think there
12 was a question asked of you about the pricing structure
13 in the service agreements. I just want to make sure
14 the record is clear.

15 A. No, we do not intend to negotiate the three-
16 base payment structure.

17 Q. And one final question. Will the service
18 agreements for all the utility customers remain in
19 effect with respect to their decommissioning
20 responsibilities until the license terminates even if a
21 utility's fuel has previously been shipped off-site?

22 A. Yes, they will.

23 MR. SILBERG: Okay. That's all the questions
24 I have.

25 JUDGE BOLLWERK: All right. Any recross?

1 MS. CHANCELLOR: No, none, your Honor.

2 MS. MARCO: Not for the staff.

3 MS. CHANCELLOR: I'm sorry. I jumped in.

4 JUDGE BOLLWERK: I looked at you. Not
5 surprising you did.

6 Nothing else, sir. You're dismissed at this
7 point.

8 So we will recall -- except for Board
9 questions. Right. I'm just moving ahead. Do you have
10 some Board questions?

11 JUDGE LAM: Mr. Parkyn, on pages 6 and 8 in
12 your prefiled testimony, you mentioned there was
13 conservatism in the funding plan because you did not
14 take into account a 2 percent real rate of return of
15 money. Are you confident you could accomplish a 2
16 percent real rate of return?

17 THE WITNESS: We are.

18 JUDGE LAM: How, may I ask?

19 THE WITNESS: Well, in looking at -- we have,
20 in a sense, two decommissioning funds. There's the
21 radiological and the nonradiological that were
22 discussed, yeah. In looking at actual decommissioning
23 fund success for -- in the case of La Crosse plant, we
24 definitely achieved better than that, under the
25 existing guidelines of the NRC, so far as funds that

1 are invested and what their growth was over inflation.

2 JUDGE LAM: How did the La Crosse plant
3 perform?

4 THE WITNESS: I just see the final report so
5 far as the amount in the decommissioning fund and its
6 growth. I know that they shifted to the patterns that
7 the NRC allowed a few years ago, and have succeeded in
8 growing over that five-year period considerably above
9 what the actual contributions of the utility were. I
10 don't know the exact percentage, but it was several
11 multiples of that.

12 JUDGE LAM: And for the PFS funding plan, you
13 would have no management role in how the money is
14 invested; is that correct?

15 THE WITNESS: No, our intent from the
16 beginning was to treat it in the manner that Part 50
17 licensees are required to externally escrow their
18 decommissioning and have it independently managed so
19 it's not accessible to PFS for any purpose. It's, in
20 effect, an external decommissioning fund that you're
21 allowed to use only when you're given permission by the
22 NRC under an approved decommissioning plan to carry out
23 a specific activity, so it would stay out with the same
24 restrictions on it that would be on it as though we
25 were an operating power plant.

1 JUDGE LAM: Thank you.

2 JUDGE BOLLWERK: Nothing further? All right.
3 Mr. Kline?

4 JUDGE KLINE: No.

5 MS. CURRAN: I have a follow-up question to
6 Judge Lam's.

7 JUDGE BOLLWERK: All right.

8 RECROSS-EXAMINATION

9 BY MS. CURRAN:

10 Q. Mr. Parkyn, I believe Judge Lam was asking
11 you about a statement that you made in answer to
12 Question 15, that a 2 percent real rate of return, such
13 as allowed by NRC regulations by 10 CFR 50.75, over 40
14 years would increase the value of the funds by 120
15 percent before taxes. Does this statement presume that
16 all of the money comes in in year 1 of the 40-year
17 period?

18 A. The money actually comes in over a period of
19 time. And there is a table in the business plan that
20 showed its collection, yeah, in arriving at these
21 rates. So no, it isn't assuming that it would all come
22 in year 1. The site decommissioning amount, you may
23 remember I mentioned, would come in the first couple of
24 years. It's this 1.7. And then the balance of it is
25 collected prior to shipment of a cask. So it's a flow-

1 through in a sense that part of that third base payment
2 that she was addressing is decommissioning. And that
3 would immediately be placed in the external fund. In
4 other words, it wouldn't stay with PFS as part of their
5 O&M.

6 Q. So the third base payment might be paid
7 sometime after year 1, with the result that -- that it
8 was collecting interest for a period of less than four
9 years?

10 A. That's true.

11 Q. Okay. And if the period over which -- if the
12 maximum period over which this base-three payment --

13 A. Could I -- just one clarifier, and that's if
14 it's collected in a date after year 1, remember, that's
15 escalated to those future decommissioning dollar needs.
16 So the amount collected per unit shipped would not be
17 the same in year 1 as it would be in a subsequent year.

18 Q. And also, can you tell me what the rate of
19 increase would be over a 20-year period?

20 A. There was a specific case in the business
21 plan for 20-year. And I -- to my memory, I'd have to
22 look at the business plan.

23 Q. But it would be something less than 120
24 percent; is that correct?

25 A. Presumably, yeah.

1 MS. CURRAN: Thank you.

2 JUDGE BOLLWERK: Okay. Anything further?

3 Mr. Lam?

4 JUDGE LAM: No.

5 JUDGE BOLLWERK: Mr. Kline?

6 JUDGE KLINE: No.

7 JUDGE BOLLWERK: I have no questions. Thank
8 you, sir. You are dismissed. Thank you for your
9 service to the Board, and you are subject to be
10 recalled. Thank you.

11 At this point, we're ready for the staff's
12 panel on this particular contention, Utah S.

13 MS. MARCO: I would like to call Dr. Alex
14 McKeigney and Mr. Robert Wood to the stand, please.

15 JUDGE BOLLWERK: Let me go ahead and swear
16 the witnesses.

17 ALEX McKEIGNEY

18 -and-

19 ROBERT WOOD,

20 called as witnesses on behalf of the NRC Staff, and
21 having been first duly sworn, were examined and
22 testified as follows:

23 DIRECT EXAMINATION

24 BY MS. MARCO:

25 Q. Hello. Do you recognize the document I

1 placed before you?

2 A. (Witness McKeigney) Yes, I do.

3 A. (Witness Wood) Yes.

4 Q. Will you please identify it.

5 A. (Witness McKeigney) It's NRC staff testimony
6 of Alex McKeigney and Robert Wood on Utah
7 Contention S -- Decommissioning Funding.

8 Q. And is there a statement of your professional
9 qualifications attached to your testimony?

10 A. (Witness McKeigney) Yes.

11 Q. And is there a statement of your, Mr. Wood --

12 A. (Witness Wood) Yes.

13 Q. Do you have any corrections to make to your
14 testimony today?

15 A. (Witness McKeigney) Yes. We found one typo.
16 Page 5, line 4 from the top, strike the word "covert."
17 No covert pass dollars. That should be the verb
18 "convert."

19 Q. And with that correction, is this testimony
20 true and correct, to the best of your knowledge and
21 belief?

22 A. (Witness McKeigney) Yes.

23 A. (Witness Wood) Yes.

24 Q. Do you adopt this written testimony as it's
25 revised now as your sworn testimony in this proceeding?

1 A. (Witness Wood) Yes.

2 A. (Witness McKeigney) Yes.

3 MS. MARCO: And now I would like to have the
4 testimony admitted into the record as corrected.

5 JUDGE BOLLWERK: And the copy that the court
6 reporter has has this correction on?

7 MS. MARCO: That is correct.

8 JUDGE BOLLWERK: All right.

9 MR. SILBERG: No objection.

10 JUDGE BOLLWERK: No objection? Then the
11 testimony of Mr. McKeigney and Mr. Wood as described by
12 counsel, with the included professional qualifications
13 attachment, are admitted into the record and will be
14 bound in the transcript as if read.

15 [Whereupon, the direct written
16 testimonies of Messrs. McKeigney
17 and Wood were inserted in
18 the record.]

19

20

21

22

23

24

25

MAY CONTAIN PROPRIETARY INFORMATION

May 15, 2000

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE 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))	

**NRC STAFF TESTIMONY OF
ALEX F. MCKEIGNEY AND ROBERT S. WOOD ON
UTAH CONTENTION S -- DECOMMISSIONING FUNDING**

Q1. Please state your names, occupations and by whom you are employed.

A1 (a). (AFM) My name is Alex F. McKeigney. I am employed as a Financial Analyst in the Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC) in Washington, D.C. A statement of my professional qualifications is attached hereto.

A1 (b). (RSW) My name is Robert S. Wood. I am employed as a Senior Level Licensee Financial Policy Advisor in the Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC) in Washington, D.C. A statement of my professional qualifications is attached hereto.

Q2. Please describe your current responsibilities.

A2 (a). (AFM) As a Financial Analyst, I perform a wide range of analytical functions pertaining to NRC regulations in such areas as financial qualifications, decommissioning funding assurance, and foreign ownership and control of nuclear reactors

MAY CONTAIN PROPRIETARY INFORMATION

and nuclear material facilities. My duties include preparing Safety Evaluation Reports and other documents regarding an applicant's or a licensee's financial capability as it relates to license activities. I conduct special studies and participate as the lead Staff member on task forces dealing with financial topics.

A2 (b). (RSW) As the NRC's Senior Level Licensee Financial Policy Advisor, I have responsibility for the development and implementation of NRC policies on and programs for nuclear property and liability insurance, financial assurance for decommissioning nuclear power facilities, financial qualifications of NRC licensees, electric utility deregulation, license transfers, and other financial and economic issues with a potential impact on the safe operations and decommissioning of NRC-licensed nuclear facilities. I provide advice to NRC senior management and technical guidance and oversight in my areas of expertise to other members of the NRC Staff, including financial analysts in the Generic Issues, Environmental, Financial, and Rulemaking Branch of the Division of Regulatory Improvement Programs of the Office of Nuclear Reactor Regulation.

Q3. Please explain what your duties have been in connection with the NRC Staff's review of Private Fuel Storage, L.L.C.'s (PFS or the Applicant) application to construct and operate an Independent Spent Fuel Storage Installation (ISFSI).

A3 (a). (AFM) As part of my official responsibilities, I reviewed the Applicant's License Application (LA) and Safety Analysis Report (SAR), pertaining to the Applicant's decommissioning funding assurance, as well as its responses to the NRC Staff's Requests for Additional Information (RAIs), related to PFS' application for an ISFSI, to be located on the reservation of the Skull Valley Band of Goshute Indians. I prepared the chapter titled "Financial Qualifications and Decommissioning Funding Assurance" (Chapter 17) of the Staff's PFS Safety Evaluation Report (SER), dated December 15, 1999

MAY CONTAIN PROPRIETARY INFORMATION

(revised and reissued on January 4, 2000). In addition, I prepared the NRC Staff's Position on Contention Utah S, dated December 15, 1999.

A3 (b). (RSW) As part of my official responsibilities, I reviewed the Applicant's LA and SAR, pertaining to the Applicant's decommissioning funding assurance, as well as its responses to the NRC Staff's RAIs related to the PFS application for an ISFSI. I reviewed Mr. McKeigney's preparation of both the chapter titled "Financial Qualifications and Decommissioning Funding Assurance" (Chapter 17) of the Staff's PFS SER, and the NRC's Position on Contention Utah S, dated December 15, 1999.

Q4. What is the purpose of this testimony?

A4. The purpose of this testimony is to provide the NRC Staff's views concerning the issues raised in Utah Contention S (Decommissioning), as modified by stipulation of the parties on April 7, 2000, which was approved by the Licensing Board on May 1, 2000.

Q5. Have you reviewed the assertions made by the State of Utah in Contention Utah S?

A5. Yes. Contention Utah S states as follows:

The decommissioning plan does not contain sufficient information to provide reasonable assurance that the decontamination or decommissioning of the ISFSI at the end of its useful life will provide adequate protection to the health and safety of the public as required by 10 C.F.R. § 72.30(a), nor does the decommissioning funding plan contain sufficient information to provide reasonable assurance that the necessary funds will be available to decommission the facility, as required by 10 C.F.R. § 72.22(e).

The contention is supported by four basis statements :

Basis 1. The Applicant has failed to provide reasonable assurance, as required by 10 CFR § 72.30(b), that funds will be available to decommission the ISFSI in that the letter of credit PFS intends to obtain "in the amount of \$1,631,000 to cover the estimated facility and site decommissioning costs,

MAY CONTAIN PROPRIETARY INFORMATION

exclusive of the storage casks," LA, App. B, p. 5-2, does not include funds for the decommissioning of the storage casks.

Basis 4. The Applicant has failed to justify the basis for its decommissioning cost estimates of \$17,000 to decommission a storage cask and of \$1,631,000 to decommission the remainder of the ISFSI in that (i) the decommissioning cost estimates do not state the year's dollars used (e.g., 1997 dollars) as provided in NUREG-1567, Draft Standard Review Plan for Spent Fuel Dry Storage Facilities, LA Appendix B, Chapter 4, and (ii) the estimates are not properly escalated to convert past dollars values into future dollars values (i.e. the future value of costs when the costs are expected to be incurred).

An applicant for a part 72 ISFSI license must submit a Decommissioning Funding Plan "at the time of the license application." Regulatory Guide 3.66, Standard Format and Content of Financial Assurance Mechanisms required for decommissioning under 10 CFR Parts 30, 40, 70 and 72 (hereafter "Reg. Guide 3.66"), at 1-3, 1-6. The Decommissioning Plan "must compare the cost estimate with present funds, and if there is a deficit in present funding the plan must indicate the means for providing sufficient funds for completion of decommissioning." NUREG-1567, at 16-4. This information is missing from the application.

Furthermore, to ensure that sufficient decommissioning funds are available, the Applicant should take a conservative approach in estimating the maximum quantity of spent fuel casks to be stored at the site during the license term.

Basis 5. The decommissioning cost estimate totally ignores the potential for large accidents and associated release or contamination at the ISFSI. LA Appendix B, Chapter 4. The very large number of casks that are to be handled at the ISFSI and the large number of operations and movements that will be required argue strongly for anticipating this potential and making arrangements for a multimillion dollar increase in decommissioning to "provide reasonable assurance that the planned decommissioning of the ISFSI will be carried out" as required by 10 CFR § 72.30.

Basis 10 The Applicant specifies that decommissioning costs include \$260,000 for a survey of the ISFSI site. LA, App B, p. 4-6. The Applicant has failed to justify the basis for this estimate in that it does not state the year's dollars used

MAY CONTAIN PROPRIETARY INFORMATION

(e.g., 1997 dollars) as provided in NUREG-1567, Draft Standard Review Plan for Spent Fuel Dry Storage Facilities, LA Appendix B, Chapter 4, and (ii) is not properly escalated ~~to convert~~ ^{convert} past dollars values into future dollars values (i.e. the future value of costs when the costs are expected to be incurred).

Q6. Please identify the regulatory requirements and guidance that pertain to decommissioning funding plans for a Part 72 ISFSI applicant.

A6. The applicable regulatory requirements are contained in 10 C.F.R. § 72.30(b) and (c), and 10 C.F.R. § 72.22(e). Regulatory guidance is provided in Regulatory Guide 3.66, "Standard Format and Content of Financial Assurance Mechanisms Required For Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," and in NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities" (March 2000). (The final version of NUREG-1567 was issued after the Staff completed its review of PFS' decommissioning funding provisions; in its review of the PFS application, the Staff utilized the Draft version of NUREG-1567 (October 1996)). Regulations and regulatory guidance concerning the decommissioning funding plan (DFP) for a Part 72 ISFSI require that applicants submit a cost estimate for decommissioning, a description of the method of assuring funds for decommissioning, and information on how reasonable assurance will be provided that adequate funding will be available to cover the estimated decommissioning cost, including means of adjusting cost estimates and associated funding levels periodically over the life of the ISFSI.

Financial assurance for decommissioning must be provided by one or more of the following methods: (1) prepayment before the start of operation into an account segregated from licensee assets such that the amount of funds would be sufficient to cover decommissioning costs; (2) a surety method, insurance, or other method that guarantees

MAY CONTAIN PROPRIETARY INFORMATION

that decommissioning costs will be paid; and/or (3) an external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund.

An ISFSI applicant's DFP must compare the decommissioning cost estimate with present funds, and if there is a deficit in present funding, the DFP must indicate the means for providing sufficient funds for completion of decommissioning. The year's dollars used in the DFP should be stated and should not be earlier than the year of preparation of the cost estimate.

Q7. What information did the Applicant provide with respect to its decommissioning funding plans?

A7. PFS provided the required elements of a DFP in its License Application and in RAI responses dated May 19 and June 18, 1998.

PFS proposed to fund decommissioning using two primary mechanisms. Estimated storage cask decommissioning costs will be prepaid into an external escrow account under terms of the Service Agreements by each customer as part of its storage fee, prior to shipment of each of its fuel canisters to the facility. This account will be segregated to be used only for storage casks. Decommissioning of the remainder of the facility and site will be funded through a letter of credit coupled with an external sinking fund. Customers also will be required to provide funds for the external sinking fund account as part of their prepaid storage fee. Additionally, customers will be required under the Service Agreements to pay the cost of decontaminating any portion of the facility for which they may be responsible as determined at a later time. As the actual cost of decontamination and decommissioning is paid into the external sinking fund, PFS plans for the letter of credit to be reduced by an equivalent amount. The per-canister fee and amounts of the escrow

MAY CONTAIN PROPRIETARY INFORMATION

account, external sinking fund, and letter of credit are to be reviewed and adjusted annually to account for inflation and for any other changes in the cost, schedule, and/or scope of decommissioning.

PFS stated that the initial estimate for decommissioning a storage cask was approximately \$17,000, which it later revised to about \$12,500. PFS, however, conservatively plans to maintain the initial \$17,000 as its estimate for fee purposes, thereby allowing for a contingency factor of about \$4,500 per cask. PFS has estimated the cost for decommissioning the remainder of the facility and site to be \$1.631 million, based on the 40,000 MTU maximum storage capacity scenario. PFS stated that facility size is a relatively minor factor in the overall cost of decommissioning. The only variance in the cost related to facility size is the area of concrete storage pads and the assumed amount of decontamination and disposal costs associated with that area. In its RAI response dated June 18, 1998, and in Revision 4 of its LA, PFS provided specific details showing how the estimated cost components of the facility and site decommissioning amounts initially supplied in the LA were developed.

Q8. The State asserts in Basis 1 that the Applicant has failed to provide reasonable assurance that funds will be available for decommissioning in that the letter of credit discussed in LA, App. B, p. 5-2, does not include funds for the decommissioning of the storage casks. Do you agree with the State's assertion in Basis 1?

A8. No.

Q9. What is the basis for your conclusion in this regard?

A9. The funding assurance mechanism for decommissioning storage casks (the external escrow account) is discussed on the previous page of the LA, App. B, p. 5-1. As discussed above, it employs a separate method of assurance for the storage casks from

MAY CONTAIN PROPRIETARY INFORMATION

the letter of credit coupled with an external sinking fund that will be used for the balance of the facility. Estimated storage cask decommissioning costs will be prepaid into an external escrow account under terms of the Service Agreements by each customer as part of its storage fee prior to shipment of each of its fuel canisters to the facility. This account will be segregated to be used only for storage casks. This method of funding assurance for the storage casks is acceptable to the NRC Staff, pursuant to 10 C.F.R. § 72.30(c). The PFS proposal provides reasonable assurance that adequate funding to decommission the storage casks associated with the minimum initial storage capacity required by PFS to commence construction will be provided prior to construction of the facility itself, as well as prior to the construction of (and operation with) each of these casks -- thus assuring that each storage cask that is constructed for initial use in the facility will be decommissioned. Also, the PFS proposal assures that funding for constructing and decommissioning each storage cask that will be added after the commencement of facility operation will be prepaid by a customer before that cask can be stored at the facility. Since the Applicant's DFP provides reasonable assurance of adequate prepayment to supply funding for decommissioning each storage cask in this manner, the Staff concluded that the funding assurance mechanisms of the DFP with respect to the storage casks meet the requirements of 10 C.F.R. § 72.30(c).

Q10. The State asserts in Basis 4 that the Applicant failed to justify the basis for its decommissioning cost estimates in that they do not state the year's dollars used and they are not properly escalated to convert past dollars values into future dollar values (i.e. the future value of costs at the time when those costs are expected to be incurred). Do you agree with the State's assertion in this regard?

A10. No.

MAY CONTAIN PROPRIETARY INFORMATION

Q11. What is the basis for your conclusion in this regard?

A11. The initial DFP contained in PFS' 1997 LA did not state explicitly that decommissioning cost estimates were in 1997 dollars; however, page 1-6a in LA Revision 4 states that "[a]ll dollars expressed are in current year dollars at the time of the license application (1997)." The Staff understood this statement to mean that all costs were expressed in 1997 dollars. In a conference call with NRC Staff on May 9, 2000, John Parkyn, Chairman of PFS, confirmed that all cost estimate figures cited in the initial 1997 LA and its revisions for construction, operations and maintenance, and decommissioning of the facility and of the casks were stated in 1997 dollars.

With respect to the dollar value of costs to be incurred in the future, in LA Revision 4 and in its RAI response dated May 19, 1998, PFS stated that: (1) the decommissioning cost estimate will be adjusted annually to account for any changes in the tasks, scope, cost, or schedule for decommissioning, including the effects of inflation based on the Consumer Price Index (CPI); and (2) the actual amount of the letter of credit will be adjusted to account for any increase in estimated decommissioning costs from the 1997 cost estimate. In a conference call with NRC Staff on May 9, 2000, John Parkyn stated that, since labor costs were the primary driver in estimating decommissioning costs, PFS plans to use the regional CPI figure for urban wage earners in the western United States as a key index in its annual adjustment of the DFP cost estimate. The urban index is being used because of the proximity of the ISFSI site to Salt Lake City. The proposed use of the CPI as described by the Applicant is appropriate and acceptable to the Staff.

Q12. The State also asserts with respect to Basis 4 that an applicant for a Part 72 facility must submit a Decommissioning Funding Plan at the time of the license application, that the Decommissioning Plan must compare the cost estimate with present funds, and

MAY CONTAIN PROPRIETARY INFORMATION

if there is a deficit in present funding the plan must indicate the means for providing sufficient funds for completion of decommissioning. The State asserts that this information is missing from the application. Do you agree with the State's assertions in this regard?

A12. No.

Q13. What is the basis for your conclusion in this regard?

A13. The DFP is provided in Sections 4 and 5 of Appendix B of the LA. On page 5-1 of LA Appendix B, PFS indicates that the customer Service Agreement will specify that decommissioning costs must be prepaid by each customer into an escrow account and that a letter of credit coupled with an external sinking fund will be used for the costs of decommissioning the remainder of the facility and site. It can be reasonably assumed that, since PFS had executed no Service Agreements with customers as of the time the LA was submitted in 1997, customer service agreements had not yet been executed and no funds had been collected for decommissioning at that time. In light of this information, the Staff does not consider that information concerning "funds collected," any deficit between the funds collected and the required funding, or the means for providing sufficient funds for completion of decommissioning, was "missing" from the application. Moreover, the PFS DFP cites financial assurance mechanisms, to be used as the methods to provide funding for decommissioning, whereby customer fees are collected to cover future decommissioning costs. This proposal is in conformance with Reg. Guide 3.66 and 10 C.F.R. § 72.30(c).

Q14. The State also asserts with respect to Basis 4 that to ensure that sufficient decommissioning funds are available, the Applicant should take a conservative approach in estimating the maximum quantity of spent fuel casks to be stored at the site during the license term. Do you agree with the State's assertion?

MAY CONTAIN PROPRIETARY INFORMATION

A14. Yes.

Q15. In your opinion, has the Applicant taken a conservative approach in its estimate of the maximum quantity of spent fuel casks to be stored at the site during the license term?

A15. Yes.

Q16. What is the basis for your conclusion in this regard?

A16. PFS assumes as the basis for its decommissioning estimate the 40,000 MTU maximum storage capacity scenario. This is a bounding case, and is appropriately conservative.

Q17. In Basis 5, the State asserts that the decommissioning cost estimate improperly ignores the potential for large accidents and associated release or contamination at the ISFSI. The State asserts that the large number of casks, operations and movements at the ISFSI argue strongly for making arrangements for a multimillion dollar increase in decommissioning to provide reasonable assurance that the planned decommissioning of the ISFSI will be carried out as required by 10 C.F.R. § 72.30. Do you agree with this assertion?

A17. No.

Q18. What is the basis for your conclusion in this regard?

A18. There is no explicit requirement in 10 C.F.R. § 72.30 that an ISFSI applicant must take large accidents into consideration in providing a decommissioning cost estimate. Further, there is no regulatory guidance which would suggest that large accidents should be considered in the formulation of an applicant's decommissioning cost estimate; nor is there guidance regarding what methods might be used to estimate the amount of funding that may be necessary to address the potential for large accidents at an ISFSI.

MAY CONTAIN PROPRIETARY INFORMATION

Q19. In Basis 10, the State asserts that the Applicant has failed to justify the basis for its estimate of the cost for a site survey, in that the estimate does not state the year's dollars used and is not properly escalated to convert past dollars values into future dollars values. Do you agree with this assertion?

A19. No.

Q20. What is the basis for your conclusion in this regard?

A20. As stated above in response to Question 11, while the DFP submitted by PFS in its 1997 LA did not state explicitly that the decommissioning cost estimate (and all the component cost estimates, such as for the survey) were in 1997 dollars, page 1-6a in LA Revision 4 states that "[a]ll dollars expressed are in current year dollars at the time of the license application (1997)." This was confirmed in a conference call with PFS on May 9, 2000, in which PFS Chairman John Parkyn confirmed that all decommissioning cost estimates cited in the LA were stated in 1997 dollars. As also stated in response to Question 11 above, with respect to the dollar value of costs to be incurred in the future, PFS clarified in LA Revision 4 and in its RAI response dated May 19, 1998, that: (1) the decommissioning cost estimate will be adjusted annually to account for any changes in the tasks, scope, cost, or schedule for decommissioning, including the effects of inflation based on the CPI; and (2) the actual amount of the letter of credit will be adjusted to account for any increase in estimated decommissioning costs from the 1997 cost estimate. PFS has further indicated, in a conference call on May 9, 2000, that it will use the regional CPI figure for urban wage earners in the western United States as a key index in its annual adjustment of the DFP cost estimate. The Staff has concluded that this proposal is appropriate and acceptable.

MAY CONTAIN PROPRIETARY INFORMATION

Q21. Please provide your conclusions regarding the adequacy of the Applicant's decommissioning funding plan.

A21. The Staff has concluded that PFS' decommissioning funding plan contains sufficient information to provide reasonable assurance that the necessary funds will be available to cover the estimated decommissioning costs for the PFS facility, including storage casks, as required in 10 C.F.R. § 72.30. Accordingly, the Applicant's DFP supports the issuance of a license for the proposed PFS ISFSI in accordance with the requirements of 10 C.F.R. Part 72.

Q22. Does this conclude your testimony?

A22. Yes.

Alex F. McKeigney

**Financial Analyst
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission**

Education

B.A. in Sociology and Economics, The University of Mississippi, 1965
M.A., Ph.D. in Sociology, The University of North Carolina, 1967 and 1969
MBA, Harvard Business School, 1978

Experience

Dr. McKeigney has significant experience in evaluating a wide variety of NRC applicants. He has worked with the NRC since April 1997 as a Financial Analyst and has conducted numerous safety reviews involving financial qualifications. He has participated in special studies and assignments, such as co-authoring a Commission Paper on monitoring foreign ownership and control of reactor licensees and serving as one of the principal reviewers of the AmerGen purchase of TMI-1.

Dr. McKeigney has many years of experience in strategic and financial planning positions with electric utilities that operate nuclear power reactors. He has evaluated the relative feasibility and profitability of alternative corporate strategies and financing plans, compared options for project financing, and has conducted numerous other quantitative analyses and reviews for electric utilities.

Dr. McKeigney has taught and developed courses in social science at the undergraduate level and in strategic planning at the graduate level. He also has worked in state-level economic development research, which included labor force analysis and financial analysis utilizing state-level econometric models.

PROFESSIONAL CHRONOLOGY: Financial Analyst, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, 1997-present; Senior Lead Planner-Operations, Entergy Services, Inc., 1993-1995; Director-Strategic Planning, Mississippi Power and Light Company, 1983-1992; Director-Strategic Planning, Middle South Services, Inc., 1980-1982; Vice President-Consulting, Social Systems, Inc., 1979; Financial Analyst, Carolina Power and Light Company, 1978-1979; Manager-Manpower Development and Analysis, Mississippi Research & Development Center, 1972-1976; Assistant Professor, Southern Methodist University, 1969-1971.

**PROFESSIONAL QUALIFICATIONS
ROBERT S. WOOD**

**Senior Level Licensee Financial Policy Advisor
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission**

Robert Wood has served as Senior Level Licensee Financial Policy Advisor in the Office of Nuclear Reactor Regulation from 1997 to the present. He has responsibility for the development and implementation of NRC policies on and programs for nuclear property and liability insurance, financial assurance for decommissioning nuclear power facilities, financial qualifications of NRC licensees, electric utility deregulation, license transfers, and other financial and economic issues with a potential impact on the safe operation and decommissioning of NRC-licensed nuclear facilities. He provides technical guidance and oversight in his areas of expertise to financial analysts in the Generic Issues, Environmental, Financial, and Rulemaking Branch of the Division of Regulatory Improvement Programs.

Mr. Wood received a B.A. degree in economics from Drew University in 1968 and an M.P.A. degree from the Ohio State University in 1971. He also successfully completed course work and qualifying exams for a Ph.D. in economics at the Ohio State University.

Mr. Wood began his professional career as a Management Intern in 1971 with the former U.S. Atomic Energy Commission. After serving as Systems Analyst and Program Analyst, Mr. Wood became Assistant to the Chief, Antitrust and Indemnity Group in 1976. Since then, he has held several positions with responsibility for the NRC's programs and policies in financial qualifications, decommissioning funding assurance, antitrust, insurance, and economic analysis. He served as Section Chief, Policy development and Financial Evaluation Section in the Inspection and Licensing Policy Branch, Office of Nuclear Reactor Regulation, from July 1992 to April 1994. From 1994 to 1997, he served as a Senior Financial Analyst. He has presented testimony on financial qualifications issues before the Atomic Safety and Licensing Board and on decommissioning funding assurance before several State Public Utility Commissions as an NRC expert.

1 JUDGE BOLLWERK: At this point in the
2 proceeding, these gentleman are now ready for
3 cross-examination.

4 MR. SILBERG: The applicant has no
5 cross-examination.

6 JUDGE BOLLWERK: The applicant has none. The
7 State of Utah?

8 MS. CURRAN: The state has no
9 cross-examination.

10 MS. MARCO: No redirect.

11 JUDGE BOLLWERK: Indelibly in my mind now.
12 Mr. Lam?

13 JUDGE LAM: Well, I'm not prepared.

14 MR. TURK: Now you know how we feel.

15 JUDGE BOLLWERK: You have a lot of notes
16 here.

17 JUDGE LAM: Well, let me ask the panel: You
18 have studied the issue. You have prepared prefiled
19 testimony. An essential element of the contention here
20 is the applicant's ability to decommission both the
21 site and the casks to comply with the agency's
22 regulation so that there will be no impact on public
23 health and safety. I would like to ask each of you to
24 provide your thoughts on a global basis. Do you have
25 an assurance that the applicant will be able to do

1 that?

2 WITNESS WOOD: Okay. Yes, we do. The
3 reasons for that, I believe, is that we've -- we've
4 evaluated their cost estimates, and based on our
5 experience with ISFSI's and reactor sites and other
6 nuclear facilities, have found that they fall within
7 the reasonable range of decommissioning costs. And
8 then we use that as a basis, then, to evaluate their
9 financial assurance measures that they took. We looked
10 at the provision for the surety bond and then the
11 individual cask decommissioning costs and the mechanism
12 of the pass-through and the ability to -- or the
13 requirement that the customers pay that up front. And
14 essentially in that basis, we determined that they did
15 provide the reasonable assurance that they're required
16 to under the regulations.

17 WITNESS McKEIGNEY: Yes, as Bob stated, we
18 looked at the information provided, made the
19 determination that it was adequate, that it met the
20 provisions of 72.30(b) and also 72.30(c) as required by
21 the regulations.

22 JUDGE LAM: So in your judgment, the
23 applicant has provided enough assurance in terms of
24 compliance of the agency's regulation?

25 WITNESS WOOD: That's correct.

1 WITNESS McKEIGNEY: That's correct.

2 JUDGE LAM: Thank you.

3 JUDGE BOLLWERK: Anything further?

4 Judge Kline?

5 JUDGE KLINE: No.

6 JUDGE BOLLWERK: I have two brief questions.

7 You heard, I take it, Mr. Parkyn testify this morning.

8 Is there anything he said during his testimony that

9 would cause you -- that came as a surprise to you or

10 something unusual, something you weren't aware of --

11 WITNESS WOOD: No.

12 JUDGE BOLLWERK: -- about the decommissioning

13 costs?

14 WITNESS McKEIGNEY: No.

15 JUDGE BOLLWERK: All right. And he

16 testified -- and if I mischaracterize this, I'll allow

17 counsel to correct me -- but basically, the

18 responsibility of those who have put fuel on-site and

19 it's later moved off will continue in decommissioning

20 costs or the coverage of decommissioning costs up to

21 the time the NRC terminates the license -- there's some

22 question: 20 years, 40 years, or simply license

23 termination. Is that your understanding of what's

24 required here?

25 WITNESS WOOD: Yes, it is.

1 WITNESS McKEIGNEY: Yes.

2 JUDGE BOLLWERK: All right. I have no other
3 questions. Any questions from the parties?

4 MS. CURRAN: Yes.

5 CROSS-EXAMINATION

6 BY MS. CURRAN:

7 Q. I believe one of you stated that the
8 decommissioning costs are to be paid up front; is that
9 correct?

10 A. (Witness Wood) In terms of the cask payments
11 that are part of the service agreements, yes.

12 Q. But I want to clarify that the cask
13 decommissioning cost payments are not being required
14 prior to the operation of the PFS facility?

15 MS. MARCO: Objection. Objection to this
16 question. This matter has been resolved and it's the
17 subject of a late-filed contention which was rejected.

18 MS. CURRAN: I'm following up on Judge Lam's
19 question -- the answer to his question about what
20 prepayment means. And I want to just clarify on the
21 record that this is not prepayment in accordance with
22 the regulations, that an exception is required, a
23 schedule of prepayment that the NRC's approving here.

24 JUDGE BOLLWERK: All right. I think the
25 matter that you're referring to has already been -- as

1 Ms. Marco described, is part of a prefiled. I think
2 the record on that is clear, so I don't think we have
3 to go any further on it at this point. You can note
4 any objection you want for the record and we'll move on
5 from there.

6 MS. CURRAN: We don't have any further
7 questions.

8 MR. SILBERG: May we just have one minute,
9 please?

10 I have no further questions at this time.

11 JUDGE BOLLWERK: All right. There will be no
12 other questions from the Board.

13 All right, gentleman . . .

14 REDIRECT EXAMINATION

15 BY MS. MARCO:

16 Q. You mentioned the surety bond. Is it true
17 that the surety bond is a letter of credit in this
18 case?

19 A. (Witness Wood) (Witness moves head up and
20 down.)

21 Q. Is that "Yes"?

22 A. (Witness Wood) Yes, it is.

23 JUDGE BOLLWERK: That's, to clarify, the
24 letter of credit and the surety bond are the same
25 thing?

1 MS. MARCO: Same thing.

2 JUDGE BOLLWERK: Any other questions by the
3 Board members, the parties?

4 At this point, gentlemen, thank you for your
5 testimony. And you're dismissed, subject to be
6 recalled.

7 I think we're ready.

8 MR. SILBERG: Before we proceed, if I could
9 have one indulgence of the Board, as a result of some
10 discussions with counsel for the Skull Valley Band, I
11 would like to put a commitment on the record. I think
12 it's not directly related to this contention, but it's
13 more an explanation for the purpose -- for the band's
14 benefit that all spent fuel will be removed from the
15 PFS site prior to license termination. I think it's
16 perfectly clear from the application, but I just want
17 to make that clear on the record for the benefit of the
18 band.

19 JUDGE BOLLWERK: So that is -- and just so I
20 understand -- your commitment to them; am I correct?

21 MR. SILBERG: Yes.

22 JUDGE BOLLWERK: So there's no confusion.

23 MS. CHANCELLOR: Point of clarification:
24 What do you mean by "license termination"?

25 MR. SILBERG: Termination of the NRC license.

1 JUDGE BOLLWERK: All right. Then Dr.
2 Sheehan, I think we're ready for you, then, sir. Are
3 you able to find a clean glass up there? You brought
4 your own. All right. Dr. Sheehan, you've previously
5 been sworn and you remain under oath, sir.

6 THE WITNESS: That's true.

7 MICHAEL F. SHEEHAN,
8 called as a witness on behalf of the State of Utah,
9 having been previously sworn, was examined and
10 testified as follows:

11 FURTHER REDIRECT EXAMINATION

12 BY MS. CHANCELLOR:

13 Q. Dr. Sheehan, do you have in front of you a
14 document entitled "Prefiled Testimony of Michael F.
15 Sheehan, Ph.D. on Behalf of the State of Utah Regarding
16 Contention Utah S," dated June 14th, 2000, revised per
17 Board order of June 12, 2000?

18 A. Yes, I do.

19 Q. Was this testimony prepared by you or under
20 your direction?

21 A. Yes, it was.

22 Q. Do you have any corrections you wish to make
23 to your testimony?

24 A. I have five corrections. Looking at page 3,
25 Answer 3, in two places it says "Contention S" -- in

1 the second line, the third line. Those should be
2 Contention E.

3 Q. Are you sure you want to make it in two
4 places?

5 A. I'm sorry. Just -- no, you're right. I
6 should only make it in the first place. Sorry. So the
7 first one is Contention E, and the second one should
8 remain Contention S.

9 Okay. The second one is on page 5, the
10 second paragraph in Answer 7, the fifth line down. It
11 says 2000, and dated December 15, 2000. That's a
12 little premature. It should be December 15, 1999.

13 MR. SILBERG: While you're on that answer, I
14 assume that applies to the second and third line of
15 that paragraph?

16 THE WITNESS: Yes. Thank you, Mr. Silberg.
17 You're absolutely right.

18 On the second line?

19 MR. SILBERG: Yes. Well, second line says
20 "December 15." The third line says "2000."

21 THE WITNESS: Yes. That's right.

22 And then the next one is on page 6, Answer 8.
23 The second sentence says, ". . . cost estimates in
24 three areas." As we can see, there are four areas.

25 And then on page 8, the second paragraph in

1 Answer 11, the fifth line down, the -- where it says --
2 the second word is "Sandia." That should be
3 "Sandquist," S-a-n-d-q-u-i-s-t.

4 I would also say that in light of the
5 testimony of Mr. Parkyn this morning and some of the
6 prefiled testimony, as with my E testimony, there will
7 be some things that have changed, and I'd be happy to
8 deal with that as the issues come up, since it, you
9 know, runs through the testimony.

10 Q. (BY MS. CHANCELLOR) Point of correction,
11 Dr. Sheehan: The spelling of Sandquist, if you look
12 further down, I believe, is S-a-n-d-q-u-i-s-t; is that
13 correct?

14 A. I'm sorry. Yes, you're right.

15 Q. And is your curriculum vitae -- is that
16 attached to Utah Contention E as Exhibit 9?

17 A. I believe so, yes.

18 Q. And is that incorporated into this testimony?

19 A. Yes, it is.

20 Q. And with the corrections as noted, do you
21 adopt this testimony as if read into the record?

22 A. I do.

23 MS. CHANCELLOR: Your Honor, with the
24 corrections noted, I would request that this testimony
25 be entered into evidence as if read.

1 JUDGE BOLLWERK: All right. Any objections?

2 MS. MARCO: The staff has an objection.

3 JUDGE BOLLWERK: All right.

4 MS. MARCO: According to Dr. Sheehan, he's
5 going to address issues as they may come up, but I
6 believe it would be beneficial to have all those issues
7 addressed initially, first. It's not clear whether it
8 necessarily will come up in cross-examination, and I
9 would like to have the complete document that he's
10 going to swear to entered in.

11 MS. CHANCELLOR: Your Honor --

12 JUDGE BOLLWERK: Your response?

13 MS. CHANCELLOR: Your Honor, Mr. Sheehan
14 prepared this testimony back on -- I believe it was May
15 15. And it was revised based on procedural issues,
16 changing attachments to exhibits. So the testimony as
17 written at the date on which it was written has been
18 accepted and offered into evidence by Dr. Sheehan. Of
19 course, testimony that has occurred during the course
20 of this proceeding will affect Dr. Sheehan's prefiled
21 testimony. But as prefiled testimony on the date on
22 which it was written, with those clerical changes, I
23 believe should be entered into the record. If
24 Ms. Marco has any questions of Dr. Sheehan as to any
25 changes in his testimony because of live testimony,

1 then she's certainly capable of inquiring into those
2 areas. If we want to take a day to go back and revise
3 this entire testimony, then we can come back on
4 Wednesday and get on with Contention S.

5 JUDGE BOLLWERK: Anything further you want to
6 say, Ms. Marco?

7 MS. MARCO: Just that any -- that it's coming
8 into the record. He has adopted it and it should be
9 complete, and we should be able to rely on it, when
10 making findings, as his sworn testimony.

11 JUDGE BOLLWERK: All right. I would agree
12 with Ms. Chancellor that this was drafted several weeks
13 ago, there were changes to it, that changes probably
14 occurred today to that you heard on the record.

15 Is that true, sir?

16 THE WITNESS: That's true.

17 JUDGE BOLLWERK: Counsel, I think, can handle
18 this accurately by simply asking him what those changes
19 were --

20 THE WITNESS: Sure.

21 JUDGE BOLLWERK: -- or what he's heard. I
22 think he's already volunteered to put forth that
23 information. I don't see that it would serve any
24 purpose to redraft his testimony totally. I think it's
25 sort of contemplated that people, when they hear things

1 in live testimony, are going to have some changes in
2 their direct prefile. He's offered already to clarify
3 that, so I'm going to go ahead and admit the testimony.

4 One question: Have these changes been given
5 to the court reporter?

6 MS. CHANCELLOR: With the exception of a
7 couple that came up during Mr. Silberg's correction.
8 So I will --

9 JUDGE BOLLWERK: Would you do that at the
10 break.

11 MS. CHANCELLOR: -- make the final
12 corrections on the final as copied.

13 JUDGE BOLLWERK: Recognizing Ms. Marcos'
14 objection, I will admit the testimony as read and have
15 it bound in the record at this point.

16 [Whereupon, the direct written
17 testimony of Dr. Sheehan was
18 inserted in the record.]

19

20

21

22

23

24

25

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	
)	Docket No. 72-22-ISFSI
)	
PRIVATE FUEL STORAGE, LLC)	ASLBP No. 97-732-02-ISFSI
(Independent Spent Fuel)	
Storage Installation))	June 14, 2000

**PREFILED TESTIMONY OF MICHAEL F. SHEEHAN, Ph.D.
ON BEHALF OF THE STATE OF UTAH
REGARDING CONTENTION UTAH S**

(Revised per Board Order of June 12, 2000)

TABLE OF CONTENTS

	Page
I. INTRODUCTION & BACKGROUND	3
A. Name, Affiliation, and Qualifications	3
B. Procedural History, NRC Regulations, and the Proposed License Conditions	4
C. Documents Reviewed and Purpose of the Testimony	5
II. ANALYSIS	
A. Failure to Account for Large Accidents in Decommissioning Cost Estimates	6
B. Failure to Provide Information about Currency of Cost Estimates	10
C. Failure to Provide Information about Cost Escalation and Other Mechanisms for Assuring Adequacy of Decommissioning Funding	11
III. CONCLUSION	14

I. INTRODUCTION & BACKGROUND

A. Name, Affiliation, and Qualifications

Q. 1. PLEASE STATE YOUR NAME AND ADDRESS FOR THE RECORD.

A. 1. My name is Michael F. Sheehan. My address is 33126 Callahan Road, Scappoose, Oregon 97056.

Q. 2. BY WHOM ARE YOU EMPLOYED?

A. 2. I am a partner in the firm of Osterberg & Sheehan, Public Utility Economists, of Scappoose, Oregon and Mount Vernon, Iowa.

Q. 3. PLEASE DESCRIBE YOUR PROFESSIONAL BACKGROUND.

A. 3. I have previously described my professional background in my testimony for Contention ~~S~~^E. The background described there pertains equally to Contention S, and is therefore incorporated herein by reference.

In addition, a copy of my curriculum vitae is included as Exhibit 9, and is also incorporated herein by reference. That document further describes my education and experience and lists my publications; again, those matters also pertain equally to Contention S. I also discussed my professional qualifications and experience in some detail relative to the issues in this case in my May 4, 2000 deposition, pages 11 through 65.

Q. 4. PLEASE DESCRIBE YOUR BACKGROUND ON ISSUES RELATED TO ESTIMATING COSTS OF DECOMMISSIONING A NUCLEAR FACILITY.

A. 4. I described my background relative to project finance, project planning and evaluation, and cost review in Part I.A of my testimony on Utah Contention E. The background described there pertains equally to Contention S, and is therefore incorporated herein by reference.

B. Procedural History, NRC Regulations, and the Proposed License Conditions

Q. 5. PLEASE BRIEFLY EXPLAIN THE PROCEDURAL HISTORY OF CONTENTION S.

A. 5. On April 22, 1998, the Licensing Board admitted Contention Utah S ("Contention S"). On May 1, 2000, the Licensing Board granted the joint stipulation by the State and PFS to sharpen the focus of Contention S as described in Attachment A of the stipulation. Memorandum and Order at 3 (May 1, 2000). Contention S asserts:

[T]he decommissioning plan does not contain sufficient information to provide reasonable assurance that the decontamination or decommissioning of the ISFSI at the end of its useful life will provide adequate protection to the health and safety of the public as required by 10 C.F.R. § 72.30(a), nor does the decommissioning funding plan contain sufficient information to provide reasonable assurance that the necessary funds will be available to decommission the facility, as required by 10 C.F.R. § 72.22(e).

LBP-98-07, 47 NRC 142, Appendix A at 255.

Q. 6. ARE YOU FAMILIAR WITH NRC REGULATIONS RELATING TO DECOMMISSIONING FUNDING, AND IF SO, WHAT DO THEY REQUIRE?

A. 6. Yes. The regulations are 10 CFR §§ 72.22(e) and 10 C.F.R. § 72.30 and I have taken them into account in formulating my testimony. Section 72.22(e) requires that an applicant either possess the necessary funds or has reasonable assurance of obtaining the necessary funds for estimated decommissioning costs, and the necessary financial arrangements to provide reasonable assurance prior to licensing that decommissioning will be carried out after the removal of spent fuel.

Under section 72.30 the Applicant must provide reasonable assurance that

the decontamination and decommissioning of the ISFSI at the end of its useful life will provide adequate protection to the health and safety of the public and provide a method of assuring funds for decommissioning, including means of adjusting cost estimates and associated funding levels periodically over the life of the ISFSI.

C. Documents Reviewed and Purpose of the Testimony

Q. 7. IN GENERAL, WHAT DOCUMENTS HAVE YOU REVIEWED WITH RESPECT TO CONTENTION S?

A. 7. I am familiar with the circumstances and material in this case generally, and specifically as they relate to Contention S. I have reviewed and am familiar with PFS's License Application in this proceeding and I have also reviewed the documents that PFS has provided to the State of Utah concerning Utah Contention E and S, PFS's responses to Discovery Requests submitted by the State, and PFS's responses to the NRC Staff's Requests for Additional Information.

I have reviewed Chapter 17 of the original Safety Evaluation Report for Systems Not Directly Associated with Storage Casks dated December 15, 1999 - 2000, the reissued Chapter 17 of the original Safety Evaluation Report for Systems Not Directly Associated with Storage Casks reissued January 4, 2000 and dated December 15, 1999 Staff, and the NRC Staff's Statement of Its Position Concerning Group I-II Contentions dated December 15, 1999.

I am familiar with the Joint Motion by the State of Utah and the Applicant to Approve Stipulation for the Hearing of Utah Contention S and the Licensing Board's May 1, 2000 order granting the joint stipulation. I have taken these documents and pleadings into account in formulating my testimony.

I am familiar with the procedural history of Contention S and I have taken it into account in formulating my testimony.

Q. 8. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. 8. The purpose of my testimony is to provide an analysis of the adequacy of PFS' decommissioning cost estimates in ^{four} ~~three~~ areas:

1. PFS' failure to account for the risk of large accidents involving the release of radioactivity on decommissioning costs;
2. The inadequacy of PFS' explanation of the mechanism it will use to ensure that its decommissioning cost estimates will track actual costs increases over time, including cost increases due to technological and regulatory changes;
3. The inadequacy of PFS' explanation of the vintage of the data underlying its cost estimates and the lack of specification of years dollars in the estimates; and,
4. The inadequacy of PFS' description of how it intends to adjust fees on an ongoing basis to track changes in estimated costs so as always to have adequate funds to decommission the facility when operations cease.

II. ANALYSIS

A. Failure to Account for Large Accidents in Decommissioning Cost Estimates

Q. 9. HAVE YOU REVIEWED PFS' DECOMMISSIONING PLAN AND COST ESTIMATES WITH RESPECT TO IMPACTS FROM POTENTIAL LARGE ACCIDENTS?

A. 9. Yes. I reviewed PFS's License Application, page 1-8 to 9, and LA Appendix B. PFS does not address any decommissioning impacts from potential large accidents. See State's Exhibit 10, excerpts from PFS License Application.

Q. 10. WHAT ASSUMPTIONS SHOULD BE MADE ABOUT THE
POTENTIAL FOR LARGE ACCIDENTS?

- A. 10. The State of Utah has an admitted contention alleging that the site's location next to an active bombing range and training area for military and warfare exercises raises significant risks for large accidents involving release of radionuclides. LPB-98-07, 47 NRC 142, Appendix A, at 253. The State of Utah also has an admitted contention identifying a significant risk at the PFS site because PFS cannot meet the design basis earthquake standard required by the Siting Evaluation Factors in 10 CFR Part 72. As described in Utah Contention L, structures, systems and components important to safety at PFS may be at risk in the event of a earthquake. LPB-98-07, 47 NRC 142, Appendix A, at 253.

Neither of these matters will be heard until after the hearing on Contention S has been completed. Unless and until this Board rules otherwise, my opinion is that an appropriately conservative cost estimate must assume that there are significant risks of radionuclide release at the facility that must be addressed through insurance (see my testimony for Utah Contention E, Part V), and/or through decommissioning costs to reflect the risk that an accident causing a serious release of radioactivity could result in additional expense for radiological decontamination at the time of decommissioning.

In addition, in the absence of information to the contrary, I would ordinarily assume industrial accidents are possible for any such large industrial facility, and, in evaluating adequacy of estimated costs, would therefore look for the expense items associated with addressing such events. Unless and until PFS demonstrates that the risk of such accidents is insignificant, my opinion is that an appropriately conservative cost estimate must assume that there are significant risks of radionuclide release at the facility that must be addressed through insurance (see my testimony for Utah Contention E, Part V), and through a decommissioning cost adjustment.

Q. 11. SHOULD PFS CONSIDER THE POTENTIAL FOR LARGE ACCIDENTS IN ITS DECOMMISSIONING PLAN AND COST ESTIMATES?

A. 11. Yes. Although PFS assumed a percent of contamination, it did not specifically address the impacts of potential large accidents. Costs related to contamination as a result of potentially large accidents may be significant.

For example, the economic impact of a severe accident has been calculated by DOE for a smaller transportation cask, for a smaller percentage of cask inventory. For a cask containing 14 PWR fuel assemblies for a shipping cask (not 24 assemblies as in the HI-STORM 100) and a release in a rural area, ^{Sandquist} Sandia has projected that the estimated contaminated area would be $4.3E+5$ square meters, with the cost of cleanup ranging between \$13 million and \$620 million (1985 dollars). The time for cleanup was projected to be 460 days. A 1% release would lead to far greater contamination and higher cleanup costs. The 1% release estimate arises from sabotage source term physical tests conducted by Sandia and Battelle Columbus Laboratories in 1981. See State of Utah's June 28, 1999 Objections and Response to Applicant's Second Set of Discovery Requests With Respect to Groups II and III Contentions, Response to Interrogatory No. 5, Utah S. See also Sandquist, GM et al, "Exposures and Health Effects from Spent Fuel Transportation," Rogers & Associates for the Department of Energy, RAE-8339/12-1, November 29, 1985; Schmidt, EW et al, "Shipping Cask Sabotage Source Term Investigation," Battelle Columbus Laboratories, NUREG/CR-2472, December 1981; Wilmot, EL, "Transportation Accident Scenarios for Commercial Spent Fuel," SAND80-2124, February 1981.

Q. 12. DO YOU KNOW WHETHER THE STAFF HAS TAKEN A POSITION ON CONTENTION UTAH S, AND, IF SO, WHAT IS ITS POSITION WITH RESPECT TO WHETHER PFS HAD ADDRESSED THE IMPACTS OF POTENTIAL LARGE ACCIDENTS IN ITS DECOMMISSIONING PLAN AND COST ESTIMATES?

A. 12. As I indicated earlier, the Staff took a position on December 15, 1999. See NRC Staff's Statement of Its Position Concerning Group I-II Contentions ("Staff's Position"). The Staff determined that the PFS provided adequate decommissioning information to protect the public health and safety and that PFS provided reasonable assurance that it will fund decommissioning. *Id.* AT 17. The Staff did not specifically address whether PFS had adequately considered the impacts of potential large accidents on the costs of decommissioning.

Q. 13. ON WHAT DOCUMENTS DID THE STAFF BASE ITS POSITION?

A. 13. As I indicated earlier, the Staff appear to rely on PFS's License Application and unspecified PFS responses to RAIs. *Id.* at 16-17.

Q. 14. DID THE STAFF ISSUE ANY OTHER ASSESSMENT OF PFS'S DECOMMISSIONING PLAN AND DECOMMISSIONING FUNDING PLAN?

A. 14. The Staff issued its assessment of financial assurance and decommissioning funding and its in the Safety Evaluation Report for Systems not Directly Associated with Storage Casks, dated December 15, 1999, recalled and revised in its entirety to correct Chapter 17 on January 5, 2000 ("SER"). The Staff do not directly address the impact of potential large accidents on decommissioning. In general the Staff did not make a determination with respect to whether the preliminary decommissioning plan contained sufficient information on decontamination procedures in order to provide reasonable assurance that the decontamination and decommissioning of the facility will provide adequate protection to the health and safety of the public because Staff has not evaluated cask-specific information. *Id.* at 13-2 to 3.

Q. 15. WHAT IS YOUR UNDERSTANDING OF THE DOCUMENTS RELIED UPON BY THE STAFF IN THE SER?

A. 15. The Staff relied upon PFS's License Application, including Appendix B, and the Safety Evaluation Report, Chapters 3, 6, 7, and 9 to evaluate

decommissioning.

Q. 16. DOES THE STAFF'S POSITIONS CHANGE YOUR OPINIONS?

A. 16. No. Apparently the Staff did not directly address the issues.

B. Failure to Provide Information about Currency of Cost Estimates

Q. 17. HAVE YOU REVIEWED THE DOCUMENTS RELATING TO PFS' DECOMMISSIONING COST ESTIMATES?

A. 17. Yes, especially PFS's License Application, page 1-8 to 9, LA Appendix B. PFS's May 19, 1998 RAI response to question 1-8 and PFS's June 18, 1998 RAI response to question 1-6.

Q. 18. DID PFS IDENTIFY YEARS' DOLLARS FOR ITS DECOMMISSIONING COST ESTIMATES?

A. 18. No. There is no indication in what years' dollars PFS made its decommissioning cost estimates, specifically its estimate that a survey of the site at decommissioning will cost \$260,000; its estimate that site decommissioning will cost \$1,631,000; and its estimate that it will cost \$17,000 to decommission a storage cask. See License Application at 1-8 and 9.

Q. 19. HAS PFS IDENTIFIED THE VINTAGE OF THE DATA USED FOR ITS DECOMMISSIONING COST ESTIMATES?

A. 19. Not in any document that has been made available to me.

Q. 20. IS IT POSSIBLE TO DETERMINE THE VALIDITY OF THE DECOMMISSIONING COST ESTIMATE WITHOUT KNOWING THE VINTAGE OF THE DATA UNDERLYING THE ESTIMATE AND THE YEARS DOLLARS?

A. 20. No. If you didn't know and you assumed that a cost estimate was based on

current cost data in current dollars, then you would have underestimated the cost of decommissioning by the amount of the real cost increase and the rate of inflation between the actual year of the data and the actual years dollars to the current year.

C. Failure to Provide Information about Cost Escalation and Other Mechanisms for Assuring Adequacy of Decommissioning Funding

Q. 21. DO PFS' COST ESTIMATES USE APPROPRIATE ESCALATION FACTORS?

A. 21. PFS states that it will adjust decommissioning cost estimates for inflation as indicated in the Consumer Price Index. *See* State's Exhibit 10, excerpts from Licensing Application, Appendix B, Rev. 4. at 5-3. However, PFS appears to restrict any adjustment to that within the range of inflation. *Id.* Even if adjustments to decommissioning cost estimates and funding mechanisms is not limited to inflation, PFS has not identified applicable escalators that account for the specific materials, labor, equipment, and location of decommissioning. Finally, as discussed previously, PFS does not identify what year's data it incorporates into its decommissioning cost estimates. Thus, its impossible to determine the accuracy of the estimates.

Q. 22. HAS PFS PROVIDED A MECHANISM TO ADJUST DECOMMISSIONING COST ESTIMATES AND FUNDING TO REASONABLY ENSURE ADEQUATE FUNDS AT THE TIME OF DECOMMISSIONING?

A. 22. No. PFS says it will annually review its decommissioning funds to account for inflation and any changes in the tasks, scope, or cost of decommissioning. *See* State's Exhibit 10, excerpts from Licensing Application, Appendix B, Rev. 4. at 5-2 to 3. However, PFS appears to limit the adjustment of the decommissioning cost estimates to inflation as rendered by the Consumer Price Index. *Id.* at 5-3. Moreover, any plans by PFS to adjust decommissioning funding as needed contradicts the statement PFS's statement in the 1998 Business Plan that "[t]here is no intention to come back after customers as DOE did on enrichment

decommissioning and dismantlement money." *See* State's Exhibit 15, excerpts from PFS 1998 Business Plan, at PFS No. 12025. Thus, it is apparent that PFS has no plans to adjust decommissioning funding for any changes in tasks, scope or scope of decommissioning.

Another uncertainty involves any required increase in the letter of credit. River Bank of La Crosse has committed to issue only a \$1.7 million letter of credit. *See* State Exhibit 11, PFS RAI Response, Question 1-7 (May 19, 1998). Thus, if and when decommissioning costs estimates increase, there is a high degree of uncertainty whether PFS will be able to secure additional funds under a letter of credit.

Q. 23. WHAT IS YOUR UNDERSTANDING OF PFS' INTENTION TO ADJUST DECOMMISSIONING COST ESTIMATES AND FUNDING TO ACCOUNT FOR TECHNOLOGY OR REGULATORY CHANGES?

A. 23. As I stated before, PFS says it will adjust costs based on any changes in task or scope. *See* State's Exhibit 10, excerpts from Licensing Application, Appendix B, Rev. 4. at 5-3. In addition to the concerns I raised in the previous question, it is not clear whether changes in task or scope would encompass any technology or regulatory changes that would outdate the original estimates. Thus, there appears to be no fiscal accountability from PFS for any future technological or regulatory changes.

Q. 24. DO YOU KNOW WHETHER THE STAFF HAS TAKEN A POSITION ON CONTENTION UTAH S, AND, IF SO, WHAT IS ITS POSITION WITH RESPECT ADJUSTING DECOMMISSIONING COST ESTIMATES AND FUNDING TO ENSURE ADEQUATE FUNDS AT THE TIME OF DECOMMISSIONING?

A. 24. On December 15, 1999, the Staff issued NRC Staff's Statement of Its Position Concerning Group I-II Contentions ("Staff's Position"). The Staff determined that the PFS provided adequate decommissioning information to protect the public health and safety and that PFS provided reasonable assurance that it will fund decommissioning. *Id.* at 17.

However, the Staff did not specifically address whether PFS had adequate mechanisms to adjust decommissioning cost estimates and funds to ensure adequate funding at the time of decommissioning.

Q. 25. ON WHAT DOCUMENTS DID THE STAFF BASE ITS POSITION?

A. 25. The Staff appear to rely on PFS's License Application and unspecified PFS responses to RAIs. *Id.* at 16-17.

Q. 26. DID THE STAFF ISSUE ANY OTHER ASSESSMENT OF PFS'S DECOMMISSIONING PLAN AND DECOMMISSIONING FUNDING PLAN?

A. 26. Yes, the Staff issued its assessment of financial assurance and decommissioning funding and its in the Safety Evaluation Report for Systems not Directly Associated with Storage Casks, dated December 15, 1999, recalled and revised in its entirety to correct Chapter 17 on January 5, 2000 ("SER"). With respect to ensuring that adequate funds are actually available at the time of decommissioning, the Staff merely state that the "per-canister fee [for decommissioning] and amounts of the escrow account, external sinking fund, and letter of credit are to be reviewed and adjusted annually to account for inflation and any changes in the scope of decommissioning." *Id.* at 17-6. Apparently, the Staff deem adjusting for inflation and changes in the scope of decommissioning adequate in that it found that PFS had provided reasonable assurance of its financial qualification to decommission the facility.

Q. 27. WHAT IS YOUR UNDERSTANDING OF THE DOCUMENTS RELIED UPON BY THE STAFF IN THE SER?

A. 27. To evaluate decommissioning, the Staff relied upon PFS's License Application, including Appendix B and Safety Evaluation Report, Chapters 3, 6, 7, and 9. The Staff apparently also relied upon a PFS Response to RAI LA 1-6 dated June 18, 1998 (the SER erroneously states the date as 1999).

Q. 28. DO THE STAFF'S POSITIONS CHANGE YOUR OPINIONS?

A. 28. No. Apparently the Staff did not directly address whether PFS had adequate mechanisms to adjust its cost estimates and funding amounts. Thus, my opinions remain unchanged.

III. CONCLUSION

Q. 29. IN YOUR OPINION, WILL SUFFICIENT DECOMMISSIONING FUNDS BE AVAILABLE AT THE TIME PFS UNDERTAKES DECOMMISSIONING?

A. 29. It is not possible to know that answer to that question given the information PFS has made available. Specifically, it is not possible to determine without knowing the basis of the original cost estimates, the year's dollars, applicable escalators, and whether the actual basis of the estimate will be annually updated. If PFS intends to limit the adjustments to inflation, it is unlikely that adequate funds will be available. Further, if PFS uses inappropriate escalators, such as national indexes that underestimate the local market, then adequate funds will not be available. Additionally, if PFS fails to review and update the basis of the data in which the cost estimates rely, then regardless of the escalators used the estimates and available funding will be inadequate. Finally, if an accident occurs and PFS has failed to provide an adequate contingency fund, either through insurance or decommissioning funds, available funding will be inadequate.

Q. 30. WHAT NEEDS TO BE DONE TO ASSURE THAT ADEQUATE FUNDS FOR DECOMMISSIONING ARE AVAILABLE AT THE TIME THE PFS CEASES OPERATIONS?

A. 30. The cost estimates must account for all costs in consistent years dollars. Then reasonably accurate cost estimates may be escalated for limited periods of time to the extent the original data of the cost estimates are still valid. In order to escalate costs with any accuracy, the years dollars of the cost estimate must be known and applicable escalators selected.

Furthermore, the basis of the cost estimate and actual decommissioning funding must be periodically updated to reflect current estimates of material, labor, equipment, and contamination levels, current regulatory requirements, and current technology changes. Thus, it is important to not only escalate cost estimates but to evaluate the basis of the estimates. PFS itself acknowledges the importance of having a "good cost estimate" that is both comprehensive and conservative. *See State's Exhibit 11, May 19, 1998 PFS LA RAI Response, Question 1-8.*

Finally, the possibility of a large accident must be considered unless and until that possibility is eliminated. Funding mechanisms, whether through insurance or decommissioning costs, must be adequate to decommission the site whenever it ceases operations – planned cessation or otherwise.

1 JUDGE BOLLWERK: Mr. Silberg, I guess you
2 have -- are you going to do cross-examination?

3 MR. SILBERG: Please.

4 FURTHER RECROSS-EXAMINATION

5 BY MR. SILBERG:

6 Q. Dr. Sheehan, I assume that you and I can
7 agree that your testimony last week with respect to
8 your qualifications is still correct in that you don't
9 estimate accidents of their probabilities and you
10 haven't estimated radiological consequences of
11 accidents or cleanup costs and that you're not a cost
12 estimator?

13 A. Yes, sir.

14 Q. If you look at Answer 10, on the bottom of
15 page 7 of your testimony, your testimony is what you
16 refer to as the significant risks of radionuclide
17 releases from PFS must be addressed through insurance
18 and through decommissioning funds; is that correct?

19 A. I'm sorry. Which paragraph are you in?

20 Q. This is the last line on page 7.

21 A. Yes, I say that.

22 Q. Okay. So you're saying there you need both
23 insurance and decommissioning funding to address
24 accident cost?

25 A. Given the uncertainties right now that we

1 face in this case with respect to having the accident
2 contentions come after the S contention, and secondly,
3 the uncertainties still with respect to insurance, I
4 think that this is appropriate.

5 Q. Okay. But don't you also say that large
6 accident costs have to be addressed through insurance
7 or decommissioning funds? Let me call your attention
8 to the bottom of page 14, your Answer 29, where you say
9 "either through insurance or decommissioning funds."

10 A. Yes. My basic concern here is that
11 decommissioning costs be adequately addressed. And to
12 the extent that one or the other, or the other,
13 adequately does it, I think that that would be okay.
14 As we stand at this point, the insurance cost seemed to
15 me to still involve some certainty; so given that
16 uncertainty, it seems to me they're saying the
17 decommissioning fund and the insurance together have to
18 be adequate to handle the problem.

19 Q. Then why did you say "or" on page -- on your
20 Answer 29?

21 A. I don't have any particular reason for that,
22 Mr. Silberg. My concern is as I've just articulated it
23 to you.

24 Q. Okay. You said at the beginning of your
25 testimony that there were some things that had changed.

1 Could you tell us what those are?

2 A. Sure. First off, Mr. Parkyn has told us both
3 in the written testimony and orally here today that the
4 figures in the letter of credit are 1997 figures and
5 the figures for the decommissioning costs, I believe,
6 were 1997 figures. He has told us today also that the
7 vintage of the data is 1997. So to the extent that
8 he's indeed correct, then my concerns about what the
9 vintage was and what the year's dollars are have been
10 addressed. Now --

11 Q. Are there any -- I'm sorry. Let you finish.

12 A. That goes to Questions 18 and 19 and 20. I
13 think that Mr. Parkyn has also addressed himself to
14 escalation factors, and so that, I believe, goes to
15 Question 21.

16 Question 22, where I say, in Answer 22 on
17 page 11, "However, PFS appears to limit the adjustment
18 of the decommissioning cost estimates to inflation as
19 rendered by the Consumer Price Index." Mr. Parkyn, in
20 his testimony, and I think on the stand today too, was
21 at pains to say that no, whatever the decommissioning
22 cost increase is, that that would be rolled into the
23 increases passed -- or that the customers would have to
24 pay. So to the extent that that is a binding
25 commitment of PFS, that appears to have addressed that.

1 The paragraph above Question 23, tail end of
2 Answer 22 -- actually, I think I'll leave that as it is
3 with respect to the letter of credit.

4 Mr. Parkyn has addressed Question 23 with
5 respect to technology regulatory changes. So I think
6 to the extent that that is -- Mr. Parkyn's testimony
7 entails a PFS commitment, that appears to have been
8 addressed.

9 Let me see. I get over to conclusions,
10 Question 29 and Question 30. The bulk of Answer 29 in
11 terms of lines is dealing with the issues we've just
12 talked about, and so I think that those have largely
13 been addressed if they are PFS commitments. And so we
14 have -- some of that's left with respect to accidents.
15 And that was, I believe, where you may be referring to
16 involving the insurance or decommissioning funds. And
17 actually, I think Answer 30 stays the same.

18 So I think that that -- if, in going through
19 this in detail, that you find other things, I'll
20 certainly call them to your attention.

21 Q. Thank you. With respect to your answers on
22 18, 19, and 20, I think it would be the same conclusion
23 that you had with respect to 21, 22, 23, and 29, that
24 to the extent that these are binding statements, if you
25 will, by PFS, that that would resolve the issue, in

1 your mind?

2 A. With respect to the vintaging, yes, it would.

3 Q. Yeah, the LOC figures that -- the year's
4 dollars and the vintage?

5 A. Yes. Yes, sir.

6 Q. Now, with respect to the large accident
7 issue, can you point us to any NRC regulation that
8 defines decommissioning in a way to include a large
9 accident?

10 A. I think -- I cannot point you to an NRC
11 regulation that does that, but I can point you, I
12 think, to the NRC regulation that says that the
13 applicant should have sufficient funds to clean the
14 place up on decommissioning without -- and it is open-
15 ended.

16 Q. But you are unaware of any regulatory
17 definition that would include accident cleanup within
18 the scope of decommissioning; is that correct?

19 A. Well, I think that the provisions in 72.22 --
20 I'd have to go look up the particular one -- don't get
21 specific as to -- they don't detail you have to clean
22 up a cask or cannister ruptures and you have to clean
23 up if there's an aerosol release. I mean, it doesn't
24 detail that. So the failure to detail it in this
25 particular case seems to me to be not peculiar.

1 Q. Are you aware of any NRC guidance that would
2 define decommissioning in a way that would include
3 accident cleanup cost?

4 A. The only one that I'm aware of that
5 doesn't -- you mean other than in the context of a --
6 of an ISFSI?

7 (A discussion was held off the record.)

8 THE WITNESS: I'm sorry. What was the
9 question, Mr. Silberg? Am I aware of any NRC
10 regulation?

11 Q. (BY MR. SILBERG) Any NRC guidance that would
12 include large accident costs. You said, "With respect
13 to an ISFSI?" and I said "No."

14 A. The only one I'm aware of is the one that you
15 folks have brought up, and I think that's in Part
16 50-something-(w), but that relates to reactors.

17 Q. And does the NRC define decommissioning
18 differently in the context of reactors as it does for
19 ISFSI?

20 MS. CHANCELLOR: Objection. Calls for a
21 legal conclusion.

22 MR. SILBERG: It calls for a statement of
23 what's in the regulations. And this guy's a lawyer.
24 I'm sorry. Dr. Sheehan's a lawyer.

25 MS. CHANCELLOR: Dr. Sheehan is not

1 testifying as an attorney. He is testifying as an
2 expert with respect to Contention S, not as the state's
3 counsel.

4 MR. SILBERG: And I'm not asking him for a
5 statement as state's counsel, but I think he can tell
6 us his understanding of what is in the NRC regulations,
7 because he is telling us that we should define
8 decommissioning in a certain way and the NRC
9 regulations define decommissioning in a certain way.

10 JUDGE BOLLWERK: Recognizing he is not
11 counsel, I'll let him answer the question to the degree
12 he does or doesn't know.

13 THE WITNESS: I'm not aware of the definition
14 of decommissioning of Part 50 offhand.

15 Q. (BY MR. SILBERG) Do you have any reason to
16 believe that the NRC defines it differently with
17 respect to different facilities in terms of whether it
18 covers accident cleanup costs or not?

19 A. I don't see the connection between the Part
20 50 regulations with respect to nuclear power plants and
21 the regulations with respect to ISFSI; so I have to
22 adjust myself as to whether or not the definition would
23 be it's safe to say it's apples and oranges and cows
24 and chickens.

25 Q. Does one decommission these sorts facilities

1 in basically the same way, by removing radioactivity
2 down to a specified level?

3 A. Much more -- I mean, this is a much different
4 process.

5 Did I answer your question?

6 Q. No. Do you remove radioactivity the same way
7 from different kinds of facilities by removing
8 radioactivity from concrete, from piping, from
9 components, from the ground, if necessary? Wouldn't
10 that be common to all facilities?

11 A. Well, you have a lot of different sorts of
12 things in a nuclear reactor. You've got pools and a
13 lot of piping and whatnot, so -- that you probably
14 don't have involved radioactivity in this sort of
15 facility. So, I mean, it seems to me that there are a
16 lot of dissimilarities. To the extent that
17 decommissioning involves getting radioactivity out of
18 there, they are similar in that simple respect, but
19 when we get down to the particulars, it's a
20 different -- a different sort of thing. They're quite
21 different.

22 Q. Are you generally aware of the amount of
23 decommissioning funding that the NRC requires for
24 nuclear power reactors?

25 A. Well, I think I have probably seen those

1 numbers doing my work -- I've done some work on 50.54
2 -- I think it's (b)(b), but I don't remember the
3 numbers offhand.

4 Q. I think you said in your deposition that you
5 were familiar with the decommissioning fund at the
6 Trojan plant?

7 A. Yeah. That's where I was thinking of when
8 you asked your previous question. And I was trying to
9 call up that number in my mind and I can't remember
10 what it was.

11 Q. Okay. Let me just show you -- I just want to
12 show you a portion of the NRC regs on decommissioning,
13 50.75.

14 MS. CHANCELLOR: 50.75? Thank you.

15 Q. (BY MR. SILBERG) Just show you to refresh
16 your recollection on reactor decommissioning in 50.75.
17 Is it not true that in that case, the costs that the
18 NRC requires as a minimum, in 1985 dollars, is, for a
19 pressurized water reactor, about \$180 million, and for
20 a boiling water reactor, about 140 million, in 1985
21 dollars?

22 A. Where are you getting the hundred eighty
23 here?

24 Q. A hundred five.

25 A. Plus seventy-five?

1 Q. Right. No. Okay -- I think it's just a
2 hundred five.

3 A. So it's table of minimum amounts, January of
4 1986 dollars required to demonstrate reasonable
5 assurance of funds for decommissioning by reactor type
6 and power level.

7 Q. I'm sorry. I think you're correct. It is a
8 hundred five instead of a hundred eighty for PWR and a
9 hundred thirty-five -- well, a hundred thirty-five for
10 boiling water reactor, and that those figures would
11 then be adjusted pursuant to the formula.

12 A. The text that you point me at does say -- in
13 fact, let's --

14 MS. CHANCELLOR: Your Honor, I'm going to
15 object to this line of questioning. Mr. Silberg -- I
16 almost said Mr. Parkyn -- Mr. Silberg is showing
17 Dr. Sheehan the regulations with respect to Part 50 and
18 what we're dealing with are the regulations with
19 respect to Part 72.

20 MR. SILBERG: Yes. And the point I want to
21 make is the comparison on decommissioning. The way the
22 NRC approaches decommissioning costs, we may have a
23 disagreement between the witness and myself as to
24 whether Part 50 definitions are relevant or not
25 relevant to Part 72, but I don't think that prohibits

1 me from continuing to explore that -- those two sets of
2 regulations.

3 MS. CHANCELLOR: But Dr. Sheehan has
4 testified that he considers it two different animals --
5 a nuclear power plant as opposed to a ISFSI. And you
6 continue to ask him questions about Part 50, and he has
7 already testified that he doesn't think Part 50
8 applies.

9 MR. SILBERG: I heard Dr. Sheehan's testimony
10 that he considers them different, but I don't think
11 that this record is necessarily bound by this witness's
12 testimony on that fact.

13 MS. CHANCELLOR: That may be true, but it
14 is -- but this witness can only testify what he knows
15 about. And to the extent that you're testifying with
16 respect to Part 50, I believe that's inappropriate.

17 MR. SILBERG: Well, I'm not testifying. I'm
18 trying to elicit from this witness his understanding of
19 the order-of-magnitude costs that NRC requires for
20 decommissioning nuclear power plants versus the
21 order-of-magnitude costs that NRC requires for property
22 insurance for nuclear power plants. I think it's a
23 perfectly legitimate line to show that the NRC
24 considers decommissioning costs to be an apple and
25 property insurance costs for cleanup of large accidents

1 to be an orange. This witness would consider them both
2 apples, I think, or maybe applesauce or --

3 MS. CHANCELLOR: Maybe this witness would
4 consider them to be lemons.

5 JUDGE BOLLWERK: In any event, I'm going to
6 allow the question because I think this is an important
7 point. I want to understand the basis for your
8 analysis in this record.

9 THE WITNESS: Certainly.

10 JUDGE BOLLWERK: And if you have a problem
11 with it on redirect, you can give whatever additional
12 information you wish.

13 Q. (BY MR. SILBERG) Thank you. The bottom line
14 to my question is: Having looked at those numbers, do
15 you have a sense that an NRC decommissioning fund for a
16 power reactor would be in the magnitude of, you know,
17 three, four, five hundred million dollars, based on
18 your experience at Trojan, where you said you were
19 familiar?

20 A. I'm sorry. I don't think I got quite the
21 thrust of the first part of the question.

22 Q. Are you generally familiar that the order of
23 magnitude of a required NRC decommissioning fund for a
24 nuclear power reactor is in the neighborhood of
25 several -- you know, low hundreds of millions of

1 dollars, three to five hundred million, just for rough
2 calculation?

3 A. What you've shown me, Mr. Silberg, is an
4 NRC -- part of an NRC rule that talks about the minimum
5 level, and it's talking about it in 1986 dollars.

6 Q. Correct.

7 A. All right. It's -- and it seems to me that
8 clearly, that being a minimum level, or it
9 apparently -- given that they're talking about a
10 minimum level means that that amount is subject to
11 adjustment in light of local conditions or some other
12 conditions, which were unspecified, as far as I could
13 see in the material that you showed me.

14 Q. Isn't it true that the NRC regulatorily, and
15 based on your experience at Trojan, does not require an
16 adjustment for local conditions while utilities are
17 collecting money for their decommissioning fund?

18 MS. CHANCELLOR: Objection. The witness has
19 already testified that he is -- that he can't recall
20 the costs at Trojan and he can't recall the specifics
21 of Part 50. And it's unfair to question the witness
22 based on Part 50 when he hasn't prepared and studied
23 Part 50 prior to this testimony, and based on the fact
24 that Mr. Silberg has shown the witness one page of the
25 regulations applicable to Part 50.

1 MR. SILBERG: Well, if the witness doesn't
2 know the answer to the question, he's free to say, "I
3 don't know."

4 JUDGE BOLLWERK: And he's also free to ask
5 for more time to look at the regulations. If he
6 wishes, the Board will certainly provide him with that
7 information. I will let him answer the question
8 subject what Mr. Silberg said and what I just said,
9 which is if you need more time to look at the reg, you
10 can do that. Or if you don't know, that's got to be
11 the answer.

12 THE WITNESS: Can I have the question one
13 more time, Mr. Silberg?

14 Q. (BY MR. SILBERG) I'll try it again.
15 Hopefully this is the question I was asking: Is it
16 your understanding that the amount of decommissioning
17 funds required by the NRC, based on the numbers that
18 you -- you've looked at in the NRC regulations and your
19 experience in Trojan, would generally be in the
20 neighborhood of, say, three to five, six hundred
21 million dollars?

22 A. And my response to that was that I think that
23 those are minimum amounts, as the section you showed me
24 indicates, in 1986 dollars. It seems to me that with
25 respect to a facility like the one we're dealing with

1 here, that the amount required should be not something
2 that comes out of, you know, the Part 50 rules; it
3 should be the amount that's appropriate for this site
4 and this facility in this location.

5 Q. That wasn't what I was asking, but let me
6 move on to the next question. Are you familiar with
7 the amount of property insurance that the NRC requires
8 for nuclear power plants?

9 A. I think I've seen some of those figures, but
10 I don't remember them right offhand either.

11 Q. Let me just show you 50.54. It's the (w)
12 regulation. 50.54(w) says, "a minimum coverage limit
13 for each reactor station site of either 1.06 billion or
14 whatever amount is generally available from private
15 sources, whichever is less."

16 A. That's what it says.

17 Q. So based on those two sets of figures, would
18 it be your understanding that the NRC requirement for
19 decommissioning funding is significantly less than the
20 amount of property insurance required for power
21 reactors?

22 A. You're -- the amount there was the 1.06
23 billion or the amount reasonably commercially
24 available. I'm sorry. That was property?

25 Q. Yes.

1 A. Okay. And the -- the other site you gave me
2 in 50, I think, 75 said a minimum of a hundred five for
3 a smaller reactor. So to the extent that those numbers
4 are different and the one is a minimum, those numbers
5 are different.

6 Q. Okay. And is it your understanding that the
7 property insurance required for the nuclear power
8 reactors would be used for cleanup costs in the event
9 that there were an accident at the site?

10 MS. CHANCELLOR: Objection. Again, for the
11 record, your Honor, what happens at a nuclear power
12 reactor doesn't apply to what happens at an ISFSI.

13 JUDGE BOLLWERK: I'm going to allow the
14 question.

15 THE WITNESS: I would imagine so, without
16 knowing in detail what the rules required.

17 Q. (BY MR. SILBERG) Thank you.

18 Because the state's contentions on aircraft
19 accidents and on earthquakes haven't yet been
20 litigated -- moving on to a different topic,
21 obviously -- you want Private Fuel Storage to assume
22 that there is a significant risk of a radionuclide
23 release from these kinds of accidents, don't you? This
24 is the first paragraph of your Answer 10 on page 7.

25 A. That's the thrust of that answer, Answer 10,

1 yes.

2 Q. But since you're not, as you said in your
3 deposition, the, quote, probability calculator guy,
4 you're not going to tell us what the probability of
5 that release is, are you?

6 A. As I'm pointing out in Answer 10, that I am
7 not the state's witness in those other contentions, and
8 given the fact that those contentions come after this
9 one, it seems to me -- and therefore we don't have the
10 necessary input into making the calculations that would
11 be required to come up with a reasonable answer in this
12 contention, that in order to be conservative, you
13 should assume that there is some substantial risk
14 pending the outcome of those contentions.

15 Q. Okay. But you're not telling us that you're
16 the expert who would tell us what that probability is?

17 A. That's right.

18 Q. Similarly, you're, as you said in your
19 deposition, that you're not the nuclear damage expert
20 guy, to use your words. You're not going to tell us
21 how much of release there would be or what it would
22 cost to clean it up?

23 A. That's right.

24 Q. Okay.

25 MR. SILBERG: Mr. Chairman, based on those

1 answers, I would like to move to strike Answer 11, the
2 second paragraph, of Mr. -- Dr. Sheehan's testimony.
3 That testimony goes to an estimate of the cleanup costs
4 and the risks of -- far greater cleanup costs from
5 large accidents. This witness just testified that he's
6 not an expert in those areas; therefore, I don't think
7 that testimony is appropriate from this witness.

8 JUDGE BOLLWERK: Saying that, the second
9 paragraph of Answer 11; is that correct?

10 MR. SILBERG: Yes, uh-huh (Affirmative).

11 MS. CHANCELLOR: There's no new information
12 here, your Honor. The time to strike the testimony,
13 under the Board's order, I believe, was maybe May 30th,
14 May 31st. Dr. Sheehan has, in his deposition,
15 testified that he was not a cost -- he was not a risk
16 assessor. So I -- I believe that the testimony should
17 stand as is and the Board can give Dr. Sheehan's
18 response to Answer 11 whatever weight it chooses.

19 JUDGE BOLLWERK: What was the date of the
20 deposition?

21 MR. SILBERG: May 4.

22 MS. CHANCELLOR: 2000.

23 JUDGE BOLLWERK: Correct. All right. I
24 would agree with Ms. Chancellor in this regard that I
25 think this motion in fact should have been made, on the

1 basis of that deposition, on the 30th of May. So we'll
2 allow the testimony to stand at this point and we'll
3 take into account, given his answers and given the
4 deposition, whatever weight it should be accorded.

5 MR. SILBERG: Okay. Thank you.

6 Q. (BY MR. SILBERG) You say in your testimony
7 that the costs related to contamination from potential
8 large accidents may be significant. This is in your
9 first paragraph in Answer 11.

10 A. Right.

11 Q. I assume it would also be true that the costs
12 may not be significant?

13 A. Certainly. If -- there's probably all
14 different kinds of accidents and natural occurrences
15 that could happen and we don't know the answer to at
16 this point.

17 Q. With respect to the reports -- first of all,
18 the reference that you gave in the second paragraph of
19 Answer 11 to your discovery responses of the June 28,
20 1999, discovery responses -- I take it there's no new
21 information in those discovery responses that isn't in
22 your -- the rest of that paragraph; is that correct?

23 A. Could you show me the discovery responses --

24 Q. Sure.

25 A. -- please?

1 What was the question? Was it something new?

2 Q. Yeah.

3 JUDGE BOLLWERK: Just so I understand, there
4 isn't anything here that isn't in the discovery
5 responses; is that correct?

6 THE WITNESS: That's -- that's right,
7 though -- one more time, Mr. Silberg? I'm sorry.

8 MR. TURK: I thought the question was,
9 there's nothing else in the discovery response other
10 than what's in here.

11 JUDGE BOLLWERK: That's what I'm trying to
12 clarify in my mind.

13 MR. TURK: That's what I thought the question
14 was.

15 JUDGE BOLLWERK: Let's make sure we get the
16 question and the answer clear. That's all.

17 THE WITNESS: Yes, as I understand your
18 question, that's correct.

19 Q. (BY MR. SILBERG) Now, the three studies that
20 you cited in your testimony, do those involve storage
21 casks?

22 A. The Sandquist study involved storage cask
23 transportation, so I think the answer to your question
24 is -- Sandquist -- I'm sorry. You're distinguishing
25 between storage casks and shipping casks?

1 Q. Correct.

2 A. Yes, these all involve shipping casks.

3 Q. Okay. Do any of these studies involve a
4 cannister-based system, such as the one that we're
5 involved with here, as opposed to shipping casks that
6 have bare fuel rods?

7 A. I don't think I know the answer to that
8 offhand.

9 Q. Would that make a difference to you?

10 A. It would to the extent that cannister might
11 provide another level of protection, and therefore the
12 sort of accidents or events that occurred here, you
13 know, had more steel to get through. It might make an
14 impact. But I cite these as references for the purpose
15 of showing that there has been some work, that it's
16 shown that it is possible that casks are not impervious
17 to the sort of things we have out in the world.

18 Q. Transportation casks?

19 A. Yes -- well, I cite them -- this is some of
20 the work that's been done on accidents, sabotage, those
21 sort of things with respect to casks that are designed
22 to protect fuel. And to the extent that the outcome
23 has shown that they are not always capable of
24 protecting the fuel, I think that it has some relevance
25 to our casks that we're talking about here, also

1 designed to protect the fuel.

2 Q. But you don't know whether these casks -- the
3 subjects of these reports were like the casks that we
4 have, do you?

5 A. I don't know that, but I know that they were
6 designed to protect the fuel, and under some
7 circumstances -- and notice some of the studies are
8 fairly old -- under some circumstances, they're not
9 able to do that. And we have had both changes in cask
10 technology but also changes in armament in the
11 intervening 20 years. And so I think that the point
12 here is not so much that these casks are the same as
13 our casks, but that certainly, with the kind of
14 technology that we have out there in terms of armament,
15 that it's important to know about this.

16 We're going to move a lot of stuff -- we're
17 going to have a lot of MTUs on this site, and it's
18 important to protect the public health and safety, that
19 we know -- at the time we're determining what the
20 adequacy of the decommissioning fund is, we have some
21 idea of what this situation is. I don't claim to know
22 the absolute answer to that. All I'm saying is that in
23 the contentions we have yet to get to, presumably we'll
24 have better data, and that data ought to be an input
25 into the determination here. That's all I'm saying.

1 Q. Okay. You said you don't know the absolute
2 answers. Do you know even the relative answers?

3 A. I know a relative answer in the sense that we
4 have this data here that shows that for cask -- that
5 for casks designed to protect fuel in transit, that
6 they are vulnerable at some level and the estimated
7 damages can -- or losses or property loss or whatever
8 in surrounding areas can be substantial, and that that
9 should be a warning bell.

10 Q. But you don't know whether these casks are
11 similar to ours?

12 A. I don't.

13 MS. CHANCELLOR: Objection. Asked and
14 answered.

15 Q. (BY MR. SILBERG) Do you know what
16 the enrichment or burn-up of the spent fuel was that
17 was involved in these studies?

18 A. I don't.

19 Q. Would that make a difference in the
20 calculation of consequences?

21 A. It would make a difference in the absolute
22 calculation of the damages, but my purpose in citing
23 these things is for the proposition that there have
24 been studies out there that show there were casks of
25 some sort designed to be safe, that they -- that there

1 is some risk, given armament and accidents. And the
2 purpose in citing these things is not for the absolute
3 correctness of the dollars and the days involved to
4 clean it up; it is to give an indication that there is
5 something to be thinking about in this context.

6 Q. Isn't it true, though, that in many of these
7 analyses, that if one were aware of the differences
8 between our situation and the situation studied, there
9 would be no consequences?

10 A. That is -- that is an assertion based on
11 uncertainty. We don't know one way or the other for
12 sure because the contentions that will deal with that
13 issue have yet to be litigated. And we will have
14 evidence on these questions then.

15 Q. No, I'm not talking about the external
16 events. I'm talking about the cannister design and the
17 type of fuel that's in the reactors. Isn't it true,
18 for instance, that in the Wilmot study, it only looked
19 at water-cooled casks?

20 MS. CHANCELLOR: Your Honor, objection. Your
21 Honor, the witness has testified the reason for using
22 these particular studies was to sort of give a large
23 overview of the potential for -- to show that casks are
24 not impervious to certain events occurring.
25 Mr. Silberg is getting into the specifics of the study.

1 That is not the reason the witness cited these studies.
2 And he's also testified at length as to why he has
3 cited these studies.

4 MR. SILBERG: But if he's citing studies that
5 are irrelevant, then it doesn't show anything. And I
6 just want to explore whether these studies have any
7 relevancy or whether this witness had selected studies
8 because (A) they -- these are the ones he may have
9 found or these are the ones that had the numbers that
10 were consistent with his testimony. But if they don't
11 relate to what we're talking about, they carry no
12 weight. And I just want to establish, if I can, that
13 these studies are not terribly relevant.

14 MS. CHANCELLOR: Your Honor, if Mr. Silberg
15 wants to challenge these studies, he can put on a
16 technical rebuttal witness to that, of course. Dr.
17 Sheehan has already testified that he's not a technical
18 expert, and he's stated why he has cited these studies.

19 MR. SILBERG: Well, if I can't challenge this
20 witness's knowledge of the studies that he cites, then
21 I'm not sure what purpose cross-examination has. I
22 don't intend to go into any great detail on these, but
23 I think there are a few questions that would be worth
24 bringing out.

25 JUDGE BOLLWERK: All right. We've heard why

1 the witness has cited the study. I understand that. I
2 think Mr. Silberg is entitled to go into this to the
3 degree the witness knows. If you can answer questions
4 about the studies on the technical details, so be it.
5 If not, that's the nature of his testimony. I'll allow
6 the testimony.

7 THE WITNESS: To answer the question with
8 respect to the Wilmot study, my recollection is that
9 that dealt with the release of aerosols, radioactive
10 aerosols. I don't remember whether the casks were
11 water-cooled or not.

12 Q. (BY MR. SILBERG) Do you remember the age of
13 the fuel in that study, that it was only fuel that was
14 less than six months old, six months out of the
15 reactor?

16 A. I don't remember that.

17 Q. And would that make a difference to you?

18 A. It would certainly -- the fuel would be
19 hotter. To that extent, the fuel would be hotter than
20 the fuel that they anticipate having here.

21 Q. Okay. And that would reduce the
22 consequences, correct?

23 A. If our fuel -- if the fuel here were breached
24 and they had an accident of this sort, it would
25 presumably be less severe than an accident that was

1 only six months old.

2 Q. And the Schmidt study involved only water-
3 cooled casks as well; is that correct?

4 A. I don't remember how the casks were cooled.

5 Q. But ours are not water-cooled?

6 A. Ours are air-cooled.

7 Q. In your testimony, you say a 1 percent
8 release would lead to far greater contamination and
9 higher cleanup costs. The 1 percent release estimate
10 arises from sabotage source term physical tests
11 conducted by Sandia and Battelle Labs in 1981. I'm
12 wondering if you could show me where that 1 percent
13 estimate comes from, because we've looked in those two
14 studies and we can't find them.

15 A. Well, I would have to -- I can't tell you
16 offhand.

17 Q. Okay. And isn't it true with respect to the
18 costs in Dr. Sandquist's study, where you say the cost
19 of cleanup ranged between 13 million and 620 million
20 dollars -- isn't it true that that wasn't, in fact, the
21 range that Dr. Sandquist presented?

22 A. I think if you look at part -- or line Roman
23 Numeral III in Sandquist, that you find, as I
24 recollect, the range is that. That was for -- as I
25 remember it, he had three elements to his scenario, and

1 that he had three lines. And his lines -- line I had
2 one element of it, line II had two elements, and line
3 III had three elements. As I remember, that was the
4 range for the third line. If you'd like to show it to
5 me, I'd be glad to look at it.

6 Q. Well, why do you eliminate the first two
7 accident classes? You only gave us the worst case when
8 you said it ranged from 13 million to 620 million?

9 A. What I was showing here was -- he parsed that
10 out, I think, as you look at that -- his analysis. He
11 has broken down the accident into two or three -- three
12 parts. And if you have all three elements in the
13 accident, you have this range.

14 Q. But if you have fewer elements, isn't it true
15 that the total cost range can be as low as \$250,000 if
16 that is the low range of his cost estimates?

17 A. If you have that in front of me, Mr. Silberg,
18 I wouldn't mind looking at it.

19 As we see, the table that Mr. Silberg has
20 shown me is cleanup cost and recover time estimates for
21 rural spent fuel rail cask accidents. And the accident
22 class is broken down into three categories. The first
23 is impact. The second is impact and burst. And the
24 third is impact, burst, and oxidation. And on the
25 third line here, where you have all three -- if you

1 have an accident involving all three of those, the
2 range is as set forth in my testimony. The thrust of
3 my testimony is that the cost of certain types of
4 accidents could be in that range. So if you want to
5 limit it to just the first line, then it would be less.

6 Q. But you didn't give us the entire range in
7 your testimony. You only selected the worst-case
8 range. Is that correct?

9 A. I gave you the range, which corresponds to an
10 accident involving those components. And what we're
11 looking at here, in order to be conservative, it seems
12 to me, is to think about what might happen. And if we
13 want to just assume that things would not happen,
14 there'd be no reason to talk about it at all, that --
15 the thrust of the Sandquist study is that you could
16 have costs in this range, that we do have a study of
17 cost in this range involving casks, involving transit
18 through rural areas -- there are other studies
19 involving urban areas, that was a rural area study --
20 and give it thought. Since we're talking about how to
21 be conservative at this point, since we don't have the
22 data from L and K, talking about being conservative,
23 seemed to me that was the only thing to do.

24 Q. Do you know how Dr. Sandquist determined
25 cases where there was oxidation?

1 A. I don't.

2 Q. Okay. So if he was dealing with a situation
3 which couldn't arise at the PFS facility, that would be
4 significant with respect to your relying on this third
5 category?

6 A. Could be significant.

7 Q. And isn't it true that he assumed that there
8 would be -- for that kind of oxidation to take place,
9 you would need a full rail tank car of petroleum?

10 MS. CHANCELLOR: Objection. The witness has
11 already testified that he is unaware of the assumptions
12 that Dr. Sandquist used.

13 MR. SILBERG: If he's unaware of these
14 assumptions, it seems to me he shouldn't be allowed to
15 support this testimony.

16 THE WITNESS: To the extent that we have
17 possible accidents on-site that would also -- could
18 also involve a substantial amount of propellant of one
19 sort or another, it seems to me the fact that to the
20 extent Dr. Sandquist relies on having a tank car or
21 something handy, that in the event, for instance, we
22 had a jet fighter crash, there is J fuel, that to the
23 extent we have propane tanks on-site, I mean, there are
24 propellants around.

25 Q. (BY MR. SILBERG) Do you know how much jet

1 fuel would be in a plane that might crash?

2 A. Well, since -- when I looked at the figure,
3 the figures for the MOA allow of a great variety of
4 different aircraft that might be using the MOA,
5 including, for instance, B-52s and F-111s.

6 Q. Do you know of any B-52s or F-111s that fly
7 down Skull Valley?

8 A. I don't know of any that fly down Skull
9 Valley, but I also don't know that there -- that there
10 are not -- that there's no possibility that in the
11 future they may fly down Skull Valley.

12 Q. And do you know what would happen if a plane
13 were to crash at high speed, that a fuel tank would
14 just pool there around the bottom of a cask and burn
15 indefinitely or would it be widely dispersed?

16 MS. CHANCELLOR: Is that a question, your
17 Honor?

18 MR. SILBERG: Yes, that's a question.

19 THE WITNESS: I don't know -- I suspect that
20 if a plane crashed into there, we could have a variety
21 of outcomes.

22 Q. (BY MR. SILBERG) Okay. You say that the
23 contaminated area -- this is citing Sandquist -- would
24 be 4.3×10^5 square meters?

25 A. That's citing Sandquist?

1 Q. Yes.

2 A. Yes.

3 Q. And do you have any idea how that -- well,
4 would it surprise you that that size of the site is
5 significantly smaller than 4.3×10^5 square meters?

6 MS. CHANCELLOR: Objection. Mr. Silberg is
7 asking the witness whether he's surprised at a certain
8 event that is not in evidence. And so I think --

9 MR. SILBERG: I'm not talking about an event.
10 I'm talking about the physical characteristics of the
11 PFS site.

12 THE WITNESS: I don't know the answer to your
13 question. I'm not quite sure why it would be relevant.
14 If you had the stuff scattered -- if you had
15 radioactivity scattered over a site that size, it seems
16 to me that you could have an impact on decommissioning
17 costs.

18 Q. (BY MR. SILBERG) Well, let me tell you why
19 it's relevant. If --

20 MS. CHANCELLOR: Objection.

21 JUDGE BOLLWERK: Is there a question?

22 MR. SILBERG: Yeah.

23 JUDGE BOLLWERK: All right.

24 MR. SILBERG: Got to wait for the question.

25 MS. CHANCELLOR: You said you were going to

1 tell him.

2 MR. SILBERG: And then I'll ask him a
3 question.

4 Q. (BY MR. SILBERG) If, indeed, it were true
5 that the site was significantly smaller than
6 4.3×10^5 square meters and the contaminated area
7 exceeded that, isn't it true that the liability
8 insurance policy which covers off-site damage would be
9 available to clean up the cost of the contaminated
10 area?

11 A. I have not seen the liability policy. I'm
12 not sure I know the answer to that. The liability
13 policy might cover that.

14 Q. Is it your understanding that Dr. Sandquist's
15 high-cost estimates, the higher range of his cost
16 estimates, were based on shipments of low-level waste
17 to Barnwell and that his low-cost estimates were based
18 on a Salt Lake City disposal at the Vitro tailings?

19 A. I don't know the answer to that.

20 MR. SILBERG: I think all my -- if we could
21 just have one minute, I think we may have . . .

22 JUDGE BOLLWERK: All right.

23 MR. TURK: Your Honor, after PFS is done with
24 cross-examination, I would like to renew their motion
25 to strike, but I would do at it this time based on the

1 relevance and usefulness of the testimony in this
2 paragraph. But I just want to give you notice that I'd
3 like to make that argument once PFS has concluded its
4 examination.

5 MR. SILBERG: The only question I might ask
6 is if Dr. Sheehan can see if he can find reference to
7 that 1 percent, where it comes from, because we simply
8 couldn't.

9 JUDGE BOLLWERK: Does he know what you're
10 referring to?

11 THE WITNESS: I know what he's referring to.
12 I --

13 MR. SILBERG: I'm sorry.

14 THE WITNESS: I don't know that I have that
15 here, so I'd be glad to make a call or two and -- maybe
16 over lunch and see if I could find that.

17 MR. SILBERG: I have the reports, if you want
18 to look through them.

19 JUDGE BOLLWERK: Anything further? That's
20 it? All right. Then staff cross-examination.

21 MS. MARCO: I only have three questions. I'm
22 not going to use the plan, if that's all right.

23 JUDGE BOLLWERK: All right. Did you make one
24 up or you just didn't have any? These questions --
25 you've decided you're not going to ask any questions?

1 If the plan you have doesn't have the questions you
2 have on the plan, you can give us the plan, but you
3 don't have to ask those questions necessarily. I'm not
4 going to -- I recognize the things you may put in a
5 plan may change radically. The question is, did you do
6 the plan or did you not?

7 MS. MARCO: Yes.

8 JUDGE BOLLWERK: She's given us the plan,
9 then. I think that things change. This may not be the
10 cross-examination you planned. It may not be where you
11 go.

12 FURTHER RECROSS-EXAMINATION

13 BY MS. MARCO:

14 Q. Please turn to Answer No. 10. And in the
15 third paragraph you refer to industrial accidents. And
16 you mentioned the possibility of industrial accidents
17 for any large -- large industrial facility. And you
18 state that the expenses associated with addressing such
19 event should be considered; is that correct?

20 A. Yes.

21 Q. Now, isn't it true that you are referring to
22 nonradiological accidents in this paragraph of Answer
23 10?

24 A. Well, this is an industrial facility. And
25 what I am talking about here is the likelihood of

1 significant accidents at an industrial facility in
2 general. So -- and what I'm saying, with respect to
3 PFS, is that this happens to be an industrial facility
4 that has SFNS stored at it. So if we were allow the
5 possibility of industrial accidents at other industrial
6 sites here, it might have a nuclear component to the --
7 what you're dealing with. So if you allow the
8 possibility of industrial accidents here, you have to
9 also allow the possibility that some of those accidents
10 would involve the release of radioactivity.

11 Q. But in your statement here, are you referring
12 to any nonradiological accident or just those involving
13 radioactivity?

14 A. I am referring -- this is a general statement
15 saying that in the presence of uncertainty, we know
16 this is an industrial site, it would not be strange to
17 find that there are accidents at industrial sites, at a
18 facility like this. Those accidents which would not be
19 unexpected just might well involve the release of
20 radioactivity.

21 Q. So it sounds like you are limiting this to
22 radioactive release?

23 A. No. It's also possible that there will be
24 accidents. It would not be strange to find that there
25 would be accidents at this facility which also did not

1 involve radioactivity.

2 Q. And do you believe that those should be
3 addressed in the decommissioning funding plan?

4 A. Those -- to the extent that radiological --
5 that we're talking about radiological decommissioning,
6 they would not be included.

7 MS. MARCO: Okay. That's all I have. That's
8 it from staff.

9 JUDGE BOLLWERK: All right. I think we have
10 two things on the table here. One would be any
11 redirect you have.

12 MS. CHANCELLOR: Yes, but we would like a
13 break before we do redirect, your Honor.

14 JUDGE BOLLWERK: And the other question would
15 be, I guess, willingness to look at your document and
16 see if they can --

17 MR. SILBERG: He's welcome to do that. It
18 depends, I guess, if we're going to go for a lunch
19 break, he can have . . .

20 MS. CHANCELLOR: We don't anticipate having
21 many questions on redirect. We'd just like a five-,
22 ten- --

23 JUDGE BOLLWERK: I'd like to finish with the
24 witness, if we could, before the break. Does anybody,
25 in terms of Contention S, anticipate any rebuttal

1 testimony?

2 MR. SILBERG: No.

3 MR. TURK: Your Honor I would like to note
4 that I would like to argue the -- whether or not the
5 paragraph -- the second full paragraph in Answer 11
6 should be allowed to remain. It may be that I need to
7 ask the witness a few questions in order to establish a
8 basis for that motion.

9 JUDGE BOLLWERK: All right. Then that
10 would -- now would be the time to do it. Okay.

11 MS. CHANCELLOR: Your Honor, just in terms of
12 the staff's redirect -- state's -- beg your pardon --

13 JUDGE BOLLWERK: Now I'm confused. I think
14 Mr. Turk has not finished his cross-examination, as I
15 understand it.

16 MR. TURK: As I understand it, you want to
17 release the witness at this time, or as soon as
18 possible, but I'd like to perhaps ask a few questions
19 now and argue a motion afterwards at your convenience.

20 JUDGE BOLLWERK: All right. That's fine.
21 Okay. I'm just -- I'm confused. I thought any
22 questions you had on cross-examination would establish
23 the basis for your motion you're making at this point.

24 MR. TURK: I was going to make the argument
25 without doing any cross-examination to support it.

1 JUDGE BOLLWERK: Okay.

2 MR. TURK: But for fear that the witness will
3 be excused and I will not be able to ask the questions
4 necessary, I should do it now.

5 JUDGE BOLLWERK: You should do it now, yes.

6 MS. CHANCELLOR: Your Honor, we may not have
7 any redirect, so we may be able to wrap this up before
8 lunch.

9 JUDGE BOLLWERK: Let Mr. Turk then ask the
10 questions that relate to his motion.

11 Do you have any -- putting aside this, do you
12 have any rebuttal with respect to this, do you think,
13 Mr. Turk? Ms. Marco?

14 MS. MARCO: We may have, but I'd need a few
15 moments to look through it.

16 JUDGE BOLLWERK: Do you see any rebuttal
17 testimony you might need?

18 MS. CHANCELLOR: We don't anticipate any.

19 MR. QUINTANA: Your Honor, if I may be
20 excused.

21 JUDGE BOLLWERK: All right.

22 Mr. Turk.

23 MR. TURK: Thank you, your Honor.

24 /

25 /

1 CROSS-EXAMINATION

2 BY MR. TURK:

3 Q. Dr. Sheehan, my name is Sherwin Turk. I'm an
4 attorney with Ms. Marco for the NRC staff in
5 Washington. I'd like to ask you just a few questions
6 about your Answer No. 11 --

7 A. Sure.

8 Q. -- so I understand the purpose for the
9 numbers provided in this part of your testimony. From
10 my reading of this paragraph -- that is, the second
11 full paragraph on Answer 11 -- I understand that you
12 are not stating that the cost of cleanup at the PFS
13 site for an accident would be in the range of 13
14 million to 620 million, in 1985 dollars. Am I correct
15 in that understanding?

16 A. I am not saying that those are the numbers
17 that would be -- you know, that would occur here. What
18 I'm trying to address here is the uncertainty that we
19 have with respect to this -- the PFS site. And I'm
20 trying to just give a suggestion of what some orders of
21 magnitude might be, given some work that's been done
22 elsewhere.

23 Q. It might be that order of magnitude, it might
24 be some other order of magnitude, correct?

25 A. That's true. But given that we have

1 uncertainty, this is just a little bit of light.
2 That's all I have it in there for.

3 Q. It may be a good light, it may be a bad
4 light?

5 A. It may be a good light, it may be a bad
6 light. But it is a light that tells us that just
7 because we have uncertainty, that the answer is
8 probably not zero.

9 Q. Also in that same paragraph you state that
10 the time for a cleanup -- I assume this is with respect
11 to --

12 A. The Sandquist.

13 Q. -- the 13 million, the 620 million estimate
14 that was 460 days?

15 A. Yes.

16 Q. You're not stating that the time for a
17 cleanup at PFS for any particular accident would be 460
18 days, are you?

19 A. I am not stating that it would be 460 days.
20 And again --

21 Q. That's the answer.

22 MS. CHANCELLOR: Objection. The witness
23 hasn't completed his answer.

24 JUDGE BOLLWERK: Go ahead and let him finish
25 the answer.

1 MR. TURK: Well, if you want to add to that,
2 sir, you're certainly welcome to, but if you can limit
3 your answer to my question, I can move a little more
4 quickly.

5 MS. CHANCELLOR: The witness should be able
6 to answer fully and completely without counsel
7 interrupting the witness.

8 Q. (BY MR. TURK) Did you have anything you
9 wanted to add?

10 A. Yes. The question was with respect to the
11 number of days it would take, I believe, and so my
12 response was, again, that this is not to say that it
13 would take 460 days here, but only given that we do not
14 have the data from these other contentions yet, I just
15 wanted to have something to show that the answer is not
16 zero and that we should not assume in this case, in
17 this part of this proceeding that the answer is zero,
18 because it is all uncertain.

19 Q. With respect to the statement in the same
20 paragraph that Sandquist had projected an estimated
21 contaminated area that would be 4.3E plus 5 square
22 meters, you're not stating that for any particular
23 accident at the PFS facility that that would be the
24 range of contamination -- the size of a contaminated
25 area, are you?

1 A. I am not suggesting that that would be. And
2 again, that is -- I put that in there for the reasons
3 I've articulated to you already.

4 Q. The same is true, I believe, also with
5 respect to your citation of a 1 percent release. Is it
6 correct that you're not stating that for any particular
7 accident at the PFS site it would be a 1 percent
8 release of the contents of a cask or more than one
9 cask, are you?

10 A. Not -- not less nor more, but there is a
11 possibility, we have some data, and that it does
12 something to color the uncertainty at this point.

13 MR. TURK: Thank you very much.

14 THE WITNESS: Sure.

15 JUDGE BOLLWERK: That concludes your
16 questioning?

17 MR. TURK: That concludes my questioning.

18 JUDGE BOLLWERK: Before we go, unless you
19 wish to -- he has a -- has advised us he has a motion
20 that's pending. Do you want to have any redirect
21 questions to the witness before we hear from him about
22 that motion or should we do the motion now?

23 MS. CHANCELLOR: If we could do the motion
24 first, then we'd like a break before we go to redirect,
25 your Honor.

1 JUDGE BOLLWERK: I just want to give you an
2 opportunity, if there's anything you want to ask the
3 witness before his motion, to do it now.

4 MS. CHANCELLOR: I believe the witness has
5 answered fully and completely -- I don't have any
6 questions -- ad nauseam.

7 MR. TURK: Mr. Silberg earlier moved to
8 strike this paragraph, the second paragraph of Answer
9 11 on the grounds that the witness admitted he not have
10 qualifications to estimate probability of release or
11 the -- the costs that would occur in the event of any
12 particular size of release at the PFS facility.

13 I would renew that motion to strike, but on
14 the additional ground that the information provided is
15 not relevant and has been admitted by the witness not
16 to be relevant to what may occur in fact at the PFS
17 site. It's not -- the numbers provided in this
18 paragraph are not tied to the casks present at the PFS
19 site, nor to any accident at the PFS site.

20 The danger I see is if this evidence is
21 allowed to stay in the record, it somehow becomes
22 misinterpreted and serves as a basis for estimating the
23 cost of a cleanup for a large accident at the PFS, and
24 in fact there is no evidence for these numbers and move
25 to strike it.

1 JUDGE BOLLWERK: Let me ask Mr. Silberg: Do
2 you have anything you want to say about that motion?

3 MR. SILBERG: No, sir.

4 JUDGE BOLLWERK: All right. Ms. Chancellor?

5 MS. CHANCELLOR: It's hard to imagine the
6 record will be misinterpreted, given Dr. Sheehan's
7 articulated reasons for including his answer to
8 Question No. 11. He has testified at length and
9 continuously that he has put this information into his
10 testimony to show that there is some degree of
11 uncertainty and that there needs to be conservatism in
12 the way in which PFS approaches accidents. The
13 Board -- the Board can accept or reject this
14 testimony -- give weight to this testimony as it sees
15 fit, zero or a hundred percent. There is no reason to
16 strike Dr. Sheehan's response to Answer No. 11 because
17 the record, based on Mr. Silberg's questions and based
18 on Mr. Turk's questions, is quite plain as to why this
19 testimony is in the record. And it is relevant because
20 it shows that PFS must -- must -- must have a
21 conservative approach to accidents and that the
22 possibility of an accident occurring at PFS is not
23 zero.

24 JUDGE BOLLWERK: All right. Let me just turn
25 to my colleagues here for a second.

1 The Board would agree with the state that the
2 questions that have been presented, or the issues that
3 have been raised with respect to the testimony are
4 going to go to the weight of the testimony. As such,
5 we are going to leave it in there and we'll take into
6 account all the cross-examination questions and answers
7 that have come out, as well as Dr. Sheehan's
8 explanation as to why he put it in there.

9 MR. TURK: Thank you, your Honor.

10 JUDGE BOLLWERK: Do you need a couple of
11 minutes to get prepared for redirect?

12 MS. CHANCELLOR: Yes, if we could, your
13 Honor.

14 JUDGE BOLLWERK: Why don't we take five
15 minutes and hopefully get this wrapped up and take
16 lunch around 12:30.

17 (A recess was taken).

18 JUDGE BOLLWERK: All right. If we come to
19 order, we'll go ahead and -- let me just, for the
20 record, ask, what is the status of the request to look
21 at the document? Have you . . .

22 MR. SILBERG: If we finish today, I mean, I'd
23 be interested. But more for personal curiosity, I
24 think, than purpose of the record. I'd just as soon we
25 close this and move on.

1 JUDGE BOLLWERK: All right. All right. Then
2 the state's redirect, then

3 FURTHER REDIRECT EXAMINATION

4 BY MS. CHANCELLOR:

5 Q. Dr. Sheehan, you mentioned that Mr. Parkyn
6 made certain commitments with respect to increases in
7 cost; for example, that Mr. Parkyn would review, or PFS
8 would -- committed to review the increases in cost
9 annually, taking into account regulatory changes,
10 technological changes, increases based on escalators;
11 is that correct?

12 A. Yes.

13 Q. Would it -- would it provide -- in your mind,
14 would it provide reasonable assurance if these
15 commitments were reduced to license conditions?

16 A. Yes, to the extent that there is -- I've had
17 some concern that in distinguishing between
18 Mr. Parkyn's statements, sometimes he appears to be
19 articulating what the current plan is; sometimes he may
20 be saying this is what he plans on doing or -- you
21 know, if he were to stay the director, he would do it
22 such and such a way. At other times he appears to be
23 saying that he's making a commitment to bind PFS. And
24 it's not always clear, when he's saying, "Yeah, we're
25 going to do so-and-so," which one of those categories

1 that assertion falls into. And to the extent, then,
2 that we could make certain that the outcome is
3 insured -- or assured by having it in a licensed
4 condition, it seems to me that we would resolve those
5 uncertainties.

6 MS. CHANCELLOR: Thank you, Dr. Sheehan. I
7 have no further questions.

8 JUDGE BOLLWERK: All right. Any recross?

9 MR. SILBERG: No, sir.

10 MS. MARCO: None from the staff.

11 JUDGE BOLLWERK: All right. Board questions?
12 Mr. Lam?

13 JUDGE LAM: Dr. Sheehan -- I'm going to hide
14 under the table -- Dr. Sheehan, the way you read the
15 regulation in Part 72, do you think the regulation, as
16 written, would require and demand the inclusion of
17 accident cleanup costs as a decommissioning cost?

18 THE WITNESS: I think that we've got two
19 things here, Judge Lam. The first thing is if you had
20 an accident, for instance, that involves some
21 radioactive release in, say, year 5, far from the time
22 of decommissioning, I'm not saying that you would use
23 decommissioning funds to fix that. What -- so as a
24 general -- as -- in a global sense, not every accident
25 involving radioactive release would necessarily be a

1 decommissioning cost.

2 What I am saying, however, is let's say that
3 there are some -- some of the trappings, some of the
4 damages, some of the radioactivity is still left on the
5 ground or in the facilities at the time the
6 decommissioning is going on, that in order to ensure
7 that the facility is adequately decommissioned and the
8 site is released in the decommissioning phase, anything
9 that is left over of radioactivities from an accident
10 needs, in the end, at least, to be cleaned up at the
11 time of decommissioning.

12 JUDGE LAM: So, Dr. Sheehan, what you are
13 saying is it doesn't matter how decommissioning cost is
14 defined; there is a potential, in your opinion, of a
15 cost liability out there due to accident cleanup?

16 THE WITNESS: Yes. And it is possible that
17 the insurance would cover that. If, as I say, the
18 accident happened in, say, year 19 of a 20-year license
19 and they were going to decommission in year 20, the
20 accident, property insurance might clean it up. But
21 anything that was not cleaned up by the time we got to
22 decommissioning, if the insurance was insufficient,
23 should be covered by decommissioning cost because we
24 certainly wouldn't want to get done with the
25 decommissioning program and say, "Well, that stuff over

1 there was caused by an accident, so therefore we don't
2 have to clean it up in decommissioning."

3 JUDGE LAM: Right. But my question is really
4 narrowed to this contention --

5 THE WITNESS: Sure.

6 JUDGE LAM: -- which is restricted to
7 decommissioning plan. So if -- if -- if the definition
8 of decommissioning exclude the cleanup of large
9 accident -- which I'm not saying it should be ignored
10 at all, but if, by definition, the decommissioning plan
11 here exclude the cleanup of a large accident, then
12 perhaps that issue should be resolved elsewhere, not
13 within the context of this contention.

14 THE WITNESS: And I think that that's a
15 possibility. But to the extent that the cleanup
16 process -- the costs of -- the cost of
17 decommissioning -- I'm sorry -- I'm talking about
18 decommissioning now. To the extent we get to the
19 decommissioning period and there is more to the -- the
20 cleanup process to be able to release the site, and
21 just because that extra radioactivity on the ground
22 happened to come from an accident as opposed to
23 something else doesn't mean that it isn't part of the
24 decommissioning expense. The reason that there's
25 radioactivity on the ground to clean up during

1 decommissioning should not determine whether or not it
2 needs to be cleaned up in the decommissioning process.

3 The source of the radioactivity is not, in my
4 mind, relevant as a -- as an indicator of being able to
5 exclude it. You wouldn't come and say, "Well, this pad
6 is radioactive because that was caused by an accident
7 but this pad over here needs to be chipped because it
8 was just gradual accumulation of radioactivity;
9 therefore, we're not doing to clean this pad up in the
10 decommissioning process." If you're in the
11 decommissioning process, it really doesn't matter at
12 that late date where the radioactivity came from. The
13 purpose of decommissioning is to clean it up, if
14 there's any left over, in the period of
15 decommissioning. And so in terms of the
16 decommissioning fund as being a residual fund -- a fund
17 for cleaning up residual radioactivity, the source of
18 the radioactivity, in my mind, is irrelevant.

19 JUDGE LAM: Dr. Sheehan, in response to
20 Mr. Silberg's question, then -- also Mr. Turk's
21 question -- on expertise, you had indicated a
22 probabilistic risk assessment or cost estimating is not
23 your expertise.

24 THE WITNESS: Are generally not.

25 JUDGE LAM: Generally not your expertise.

1 THE WITNESS: I have dealt with those
2 subjects in an academic framework, and I have even
3 written a bit on it, but it's not my line of work.

4 JUDGE LAM: My question is, what can you tell
5 us in weighing and balancing that fact with the
6 testimony that you have given on large accident, its
7 potential and its significance?

8 THE WITNESS: My purpose including the second
9 paragraph in Answer 11, your Honor, is that we -- we
10 are missing -- again, this is an ordering of the -- you
11 know, the sequencing of the contentions. The --
12 putting in this paragraph is simply to call the Board's
13 attention to the fact that there are studies out there
14 that indicate that the probability of having the type
15 of accident they're talking about in a context of
16 different kinds of casks -- that this gives some
17 indication that the probability is probably not zero
18 and that there is something to go and look at, that
19 there are studies out there. I have cited some of
20 them. They might not be exactly on point here, but
21 there are studies out there.

22 My only point is to say that we should not
23 assume that the probability is zero for the purposes of
24 deciding the S contention, simply because we haven't
25 had a chance to get to the data in the L and K

1 contentions. This was, in that sense, a little bit of
2 a place holder.

3 JUDGE LAM: Thank you, Dr. Sheehan.

4 JUDGE BOLLWERK: Dr. Kline?

5 JUDGE KLINE: Dr. Sheehan, at the beginning
6 of your testimony today, you were given -- you made an
7 offer to modify it in the light of live testimony that
8 you heard.

9 THE WITNESS: Yes, sir.

10 JUDGE KLINE: And I just want to clarify
11 something regarding Question 22, the last paragraph.
12 It begins "another uncertainty."

13 THE WITNESS: Yes, sir.

14 JUDGE KLINE: Okay. You have the place?

15 THE WITNESS: I do.

16 JUDGE KLINE: Do I recall correctly that you
17 let that one stand, that you declined to modify it?

18 THE WITNESS: I did. That's correct.

19 JUDGE KLINE: And that's what I wanted
20 clarified. Do you recall Mr. Parkyn stating that with
21 the passage of time, there would be a cash escrow and
22 that the -- the value of the letter of credit would --
23 is expected to decline over the passage of time? Do
24 you recall him saying that?

25 THE WITNESS: Yes, sir, I do.

1 JUDGE KLINE: Okay. Would you then explain
2 your intent in leaving this paragraph intact?

3 THE WITNESS: Yes, sir. My -- my
4 understanding is that the basic plan is to have the
5 escrow -- to have the letter of credit, and then as
6 fuel comes on-site, that funds will be paid in and PFS
7 could replace the letter of credit. That's the
8 purpose -- or the idea. We do have the possibility,
9 however, as those funds are being paid in, that the
10 costs -- the costs of decommissioning -- the estimated
11 costs, on a year -- they're going to be reviewed every
12 year, and the costs might go up.

13 JUDGE KLINE: What cost?

14 THE WITNESS: The decommission -- the
15 estimated decommissioning costs might increase for site
16 decommissioning, right?

17 JUDGE KLINE: Okay. Okay.

18 THE WITNESS: Now, my concern here, for
19 instance, that -- let's say -- let's say, for instance,
20 there's a serious accident on-site and that it might
21 take a long time -- let's say we get into year 19 of a
22 20-year license, and that for the period -- we only
23 have one year left -- that Mr. Parkyn may be in a
24 situation of having to go -- because he cannot get the
25 entire cost immediately back from everybody that's had

1 fuel there, he might need the possibility of having to
2 reestablish a letter of credit to guarantee the funds
3 until he can bring in or collect all the extra money.
4 There -- that was my -- my only point there.

5 JUDGE KLINE: But the statement is that there
6 might be an increase in the letter of credit. Is it
7 your view that the combined availability of funds that
8 is combined with the letter of credit, combined with
9 the --

10 THE WITNESS: Escrow.

11 JUDGE KLINE: -- escrow would exceed 1.7
12 million?

13 THE WITNESS: I think --

14 JUDGE KLINE: Or the credit would grow so
15 high that the letter of credit itself would have to
16 exceed 1.7 million?

17 THE WITNESS: I think the 1.7 million is a
18 small number as these figures go.

19 JUDGE KLINE: No, but once there is an escrow
20 in hand, is there ever a likelihood that the letter of
21 credit itself would have to grow higher than that?

22 THE WITNESS: And the -- my answer to that
23 is, it seems to me that there -- one can imagine a
24 scenario where the increase in cost, estimated cost
25 takes a substantial jump.

1 JUDGE KLINE: I see.

2 THE WITNESS: All right. So you have the
3 escrow account, replaces a letter of credit. And let's
4 say the escrow account now has \$2 million in it and you
5 don't need the letter of credit. But then let's say
6 you find in one year that for some reason that the cost
7 of decommissioning, for whatever reason, goes to 20
8 million, jumps up from two to twenty and you don't have
9 enough fuel on-site yet in order to get that amount of
10 money back, so you might have to establish a letter of
11 credit, which will then be worked down again as you get
12 more MTUs coming on-site. If you understand what I --

13 JUDGE KLINE: Yeah, I understand.

14 THE WITNESS: So in that sense, you might
15 have to reestablish a letter of credit and have it at a
16 high level because you don't have enough fuel that's
17 come on-site to cover the cost. The escrowed amount
18 that would -- the escrow would have to go from, say,
19 2 million to 20 million and you don't have enough MTU
20 on-site to fund that, so what you might do is establish
21 a letter of credit at 18 million and then work that
22 down as you got more MTU on-site.

23 JUDGE KLINE: I understand the scenario you
24 have in mind.

25 JUDGE BOLLWERK: Anything further? Any

1 questions -- any questions for the parties?

2 MS. CHANCELLOR: No, your Honor.

3 MS. MARCO: Nothing.

4 JUDGE BOLLWERK: At this point, I understood
5 there is or is not any rebuttal testimony?

6 MR. SILBERG: To S?

7 JUDGE BOLLWERK: For S.

8 MR. SILBERG: None.

9 JUDGE BOLLWERK: None from the applicant?

10 MS. MARCO: We just have a little piece.

11 JUDGE BOLLWERK: How long is a little piece
12 and how long will it take?

13 MS. MARCO: About five to six minutes.

14 JUDGE BOLLWERK: Okay. Do you have any
15 rebuttal testimony on S?

16 MS. CHANCELLOR: Not unless the staff puts
17 something on. But we have nothing at the moment, your
18 Honor.

19 JUDGE BOLLWERK: Okay. Should we go ahead
20 and do the rebuttal and get it finished --

21 MS. MARCO: Yes.

22 JUDGE BOLLWERK: -- and take a lunch break?

23 Mr. Parkyn, thank you very much.

24 THE WITNESS: Sheehan. Sheehan.

25 JUDGE BOLLWERK: This is not my day. Dr.

1 Sheehan. Thank you for your service to the Board. And
2 I apologize to you, sir. I don't know what my problem
3 is today.

4 MS. MARCO: I would like to call back
5 Dr. McKeigney and Mr. Wood to the stand.

6 JUDGE BOLLWERK: All right, gentlemen. You
7 remain under oath.

8 ALEX McKEIGNEY

9 -and-

10 ROBERT WOOD,
11 called as witnesses on behalf of NRC Staff, and having
12 been previously sworn, were examined and testified as
13 follows:

14 REBUTTAL EXAMINATION

15 BY MS. MARCO:

16 Q. Hello. Does PFS proposed letter of credit
17 conform to the commission's regulations for letters of
18 credit?

19 A. (Witness McKeigney) Yes.

20 A. (Witness Wood) Yes.

21 Q. Does the letter of credit conform with the
22 staff's guidance for letters of credit?

23 A. (Witness McKeigney) Yes.

24 A. (Witness Wood) Yes.

25 Q. Is an applicant that relies on a letter of

1 credit for decommissioning funding required to
2 demonstrate an ability to secure additional funds for
3 future events?

4 A. (Witness McKeigney) No.

5 MS. MARCO: That's all the questions I have.

6 JUDGE BOLLWERK: All right. Any cross-
7 examination?

8 MR. SILBERG: Not for the applicant.

9 MS. CURRAN: Hold on just one moment, please.
10 No further questions.

11 JUDGE BOLLWERK: All right. No further
12 questions? Then you gentlemen are dismissed. Thank
13 you for your service to the Board. And subject to be
14 recalled as necessary.

15 All right. If I understand it, that
16 concludes what we need to do with respect to
17 Contention S. Everyone has had an opportunity to put
18 in their evidence. I should ask, did -- did any Board
19 members have any questions?

20 JUDGE KLINE: (Moves head from side to side.)

21 JUDGE LAM: (Moves head from side to side).

22 JUDGE BOLLWERK: At this point let's go ahead
23 and take our luncheon break. We'll go to quarter to
24 two. We're taking a little bit of a late lunch today.
25 Could I see counsel up here for two seconds, then we'll

1 have everyone on their way, but we'll stand adjourned.

2 * * *

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

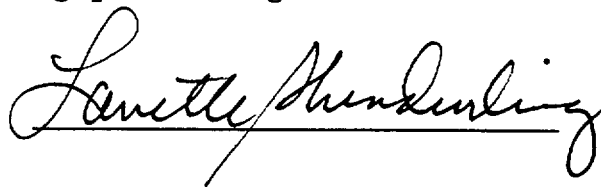
REPORTER'S CERTIFICATE

This is to certify that the attached proceedings
before the United States Nuclear Regulatory Commission in
the matter of:

NAME OF PROCEEDING: PRIVATE FUEL STORAGE

CASE NO: 72-22-ISFSI

PLACE OF PROCEEDING: Salt Lake City, Utah
were held as herein appears, and that this is the original
transcript thereof for the file of the United States Nuclear
Regulatory Commission taken by me and thereafter reduced to
typewriting by me or under the direction of the court
reporting company, and that the transcript is a true and
accurate record of the foregoing proceedings.

A handwritten signature in cursive script, reading "Loretta Henderson", written over a horizontal line.

Official Reporter

Ann Riley & Associates, Ltd.

\$	24 [1] 2430:10	ability [3] 2481:20 2482:12 2551:8	adequately [4] 2427:3 2494:11, 13 2541:12
\$1.7 [1] 2448:14	2425 [1] 2416:10	able [12] 2438:23 2453:24 2469:7	adjoined [1] 2552:10
\$180 [1] 2501:20	2471 [1] 2416:11	2481:25 2487:4 2491:11 2514:11	adjust [3] 2426:22 2427:2 2499:23
\$2 [1] 2548:10	2477 [1] 2416:13	2531:8,12 2534:10 2542:25 2543:9	adjusted [2] 2431:9 2502:12
\$250,000 [1] 2520:18	2484 [1] 2416:14	above [3] 2448:14 2475:11 2496:1	adjustment [4] 2426:18 2495:17 2505:12,17
/	2486 [1] 2416:17	above-entitled [1] 2414:12	Administrative [5] 2414:16,20, 24 2419:2 2422:23
/ [2] 2532:4,5	2492 [1] 2416:18	abreast [2] 2438:3 2439:8	admit [2] 2492:5,16
0	2526 [1] 2416:19	absolute [4] 2514:24 2515:3,23 2516:4	admitted [4] 2480:10,19 2536:14, 20
0-15 [1] 2416:4	2531 [1] 2416:20	absolutely [1] 2488:18	adopt [3] 2424:11 2480:5 2489:23
1	2538 [1] 2416:21	academic [1] 2544:7	adopted [1] 2491:10
1 [19] 2445:13,22 2450:13 2463:22,23 2464:3,20,24 2476:20	27 [1] 2414:11	accept [2] 2420:24 2537:18	advance [2] 2462:5 2469:2
2477:1,11,19,22 2519:9,11,14 2526:11 2535:10,12	28 [2] 2448:4 2511:20	accepted [3] 2441:18,19 2490:20	advanced [2] 2443:15 2449:7
1-percent [4] 2463:21 2464:7,8, 11	28th [1] 2447:4	accessible [1] 2475:22	advances [3] 2438:13,25 2449:5
1.06 [2] 2507:14,23	29 [5] 2494:8,20 2496:10,10,23	accident [49] 2470:11,20 2493:24 2494:1,6 2497:7,10,18 2498:4,13 2499:19 2508:10 2519:1,2	advised [1] 2535:24
1.6 [5] 2432:22 2441:5 2442:6 2447:18 2461:17	3	2520:9,13,15,24 2521:4,13 2528:16 2532:18 2533:22 2535:3,12 2536:24 2537:3 2538:2 2540:22, 25 2541:4,14,20,23,25 2542:6,14, 16 2543:2,12 2544:11,20 2546:25	aerosol [1] 2497:24
1.7 [7] 2447:21 2448:6 2461:18 2477:3 2547:16,21,22	3 [4] 2428:17 2451:15 2487:25 2488:1	accidental [1] 2453:12	aerosols [2] 2518:11,12
10 [7] 2476:17 2493:14 2508:25 2509:1,7 2527:18 2528:2	30 [2] 2496:10,17	accidents [31] 2470:4,4,7 2493:9, 11 2496:14 2504:1 2508:20,24 2510:6 2511:9,15 2513:14,22 2516:3 2520:24 2521:7 2522:20 2527:19,20 2528:1,5,9,12,13,21, 22 2529:3,4 2537:17 2538:1	affect [3] 2420:20 2442:12 2490:22
105 [3] 2524:2,8 2525:9	300 [1] 2415:6	accomplish [1] 2474:18	affected [1] 2453:9
11 [14] 2489:2 2495:17 2510:2,10, 19 2511:10,20 2530:9 2532:11, 16 2536:14 2537:13,21 2544:14	30th [2] 2510:14 2511:2	accordance [1] 2484:21	Affirmative [3] 2430:16 2444:14 2510:11
12 [2] 2430:3 2487:18	31st [1] 2510:15	accorded [1] 2511:5	afraid [1] 2446:7
12:30 [1] 2538:21	333 [2] 2428:19,20	According [1] 2490:6	afternoon [3] 2417:12,13,14
120 [2] 2476:18 2478:3	4	account [9] 2435:9 2440:25 2464:25 2474:17 2511:4 2538:11 2539:14 2548:9,10	afterwards [1] 2530:24
13 [7] 2436:3,8,9 2519:21 2520:10 2532:18 2533:18	4 [5] 2428:2 2446:12,21 2479:22 2510:22	accumulation [1] 2543:13	age [2] 2449:19 2518:14
14 [4] 2436:3,8,9 2494:8	4.3 [3] 2524:2,8 2525:9	accurate [1] 2422:16	agency's [2] 2481:21 2482:24
140 [1] 2501:21	4.3E [1] 2535:1	accurately [1] 2491:20	ago [2] 2475:10 2491:15
14th [1] 2487:17	40 [3] 2449:21 2476:17 2483:22 40-year [1] 2476:20	achieveable [1] 2434:19	agree [4] 2491:13 2493:7 2510:25 2538:6
15 [10] 2436:4,8,9 2440:6 2450:12 2476:16 2488:12,13,21 2490:17	460 [4] 2533:19,22,24 2534:18	achieved [1] 2475:2	agreement [21] 2450:19,22 2451:3,10,23 2452:4,11,17 2457:19,25 2458:13 2459:14 2462:1 2467:3, 4,17 2468:7 2469:6,18,19 2471:12
150 [1] 2414:9	5	acre [1] 2431:24	agreements [18] 2457:17,18,20, 24 2458:11,17,23 2462:24 2463:17 2467:10,13 2468:9 2469:10 2473:10,11,16,21 2484:11
160 [1] 2415:6	5 [4] 2479:22 2488:10 2535:1 2541:1	acres [3] 2431:16,17,19	ahead [1] 2421:4 2428:18 2462:7 2466:24 2474:12 2478:20 2492:5 2534:4 2538:24 2549:25 2552:6
18 [3] 2495:12 2496:22 2549:2	50 [15] 2415:20 2475:19 2499:15, 21 2502:18,25 2503:7,8,17 2505:22,23,24 2506:1 2507:3 2508:3	Act [1] 2454:3	air-cooled [1] 2519:8
19 [4] 2495:12 2496:22 2541:23 2547:1	50-something-(w [1] 2498:17	acting [1] 2451:19	aircraft [2] 2508:19 2523:7
1981 [1] 2519:13	50.54 [2] 2501:2 2507:12	action [2] 2429:6 2457:13	Alex [4] 2478:18,22 2479:11 2550:14
1985 [3] 2501:19,21 2532:19	50.54(w [1] 2507:13	active [1] 2438:9	aligned [1] 2422:3
1986 [3] 2502:5 2505:6 2506:25	50.75 [4] 2476:17 2501:14,15,17	activities [8] 2429:8 2431:7 2435:18,22 2439:6 2454:10,11 2455:16	allocation [1] 2452:13
1987 [2] 2430:14,15	500 [1] 2414:9	activity [2] 2455:8 2476:1	allow [11] 2456:5 2468:14 2483:16 2504:7 2508:14 2511:3 2518:7 2523:6 2528:8,11,13
1994 [1] 2428:10	5th [1] 2415:6	actual [7] 2438:22 2440:25 2441:21 2464:4 2468:7 2474:25 2475:12	allowed [6] 2475:10,24 2476:17 2522:17 2530:10 2537:1
1997 [14] 2426:13,16 2432:6 2433:19 2435:22,23 2437:25 2441:5,21 2442:6 2447:24 2495:4,6,7	6	actually [10] 2421:6 2432:12 2436:21 2439:10 2446:9 2465:4, 25 2476:22 2496:2,17	allows [1] 2462:1
1998 [2] 2448:1,4	6 [7] 2440:6 2450:12 2451:4,4,15 2474:14 2488:23	ad [1] 2536:11	almost [1] 2502:17
1999 [2] 2488:13 2511:21	60 [1] 2417:15	add [2] 2534:6,14	already [10] 2438:9 2462:21 2484:25 2491:24 2492:4 2503:8 2505:20 2517:19 2522:14 2535:8
2	620 [4] 2519:21 2520:10 2532:19 2533:18	add [2] 2534:6,14	although [1] 2468:14
2 [8] 2445:12,14,18 2451:4 2474:17,18 2476:16 2548:25	7	additional [4] 2419:25 2504:12 2536:19 2551:8	AMERICA [1] 2414:1
20 [8] 2449:17 2483:22 2495:12 2496:22 2514:13 2541:24 2548:13,25	7 [4] 2488:11 2493:15,20 2508:25	address [3] 2490:7 2493:23 2532:23	American [2] 2438:9 2443:13
20-year [8] 2468:5,5,6,11 2477:24 2478:1 2541:23 2547:2	72 [3] 2502:20 2503:1 2540:20	addressed [11] 2490:9 2493:17 2494:6,11 2495:10,13,25 2496:4, 8,13 2529:7	amount [42] 2433:7,8,11 2434:11 2440:18,22,24 2441:2,3,5,20,22 2442:20 2447:21 2448:13 2452:12 2462:9,21 2464:1,21,22 2465:8,9 2468:25 2472:3,4 2475:8 2477:1,21 2500:23 2505:11 2506:17 2507:2,4,8,15,21,23,24
2000 [9] 2414:11 2447:17,18 2487:17,18 2488:12,12,21 2510:23	72.22 [1] 2497:21	adequacy [1] 2514:22	
20036 [1] 2415:11	72.30(b [1] 2482:20	adequate [3] 2462:8 2482:19 2494:18	
20037 [1] 2415:16	72.30(c [1] 2482:20		
20555 [1] 2416:5	75 [1] 2508:3		
21 [2] 2495:15 2496:23	8		
22 [2] 2495:16,16 2496:2,23 2545:16	8 [3] 2474:14 2488:24 2489:1		
23 [3] 2496:1,4,23	80 [1] 2424:1		
	82 [1] 2430:9		
	84101 [1] 2414:10		
	84114 [1] 2415:7		
	87 [1] 2430:1		
	88 [2] 2430:2,19		
	9		
	9 [1] 2489:17		
	9:00 [1] 2414:13		
	9:04 [1] 2417:2		
	A		
	a.m [2] 2414:13 2417:2		

<p>2522:21 2548:15,23 amounts [3] 2449:6 2502:4 2506:24 ample [1] 2455:4 analyses [1] 2516:9 analysis [3] 2440:17 2504:9 2520:12 analytical [1] 2434:17 animals [1] 2503:5 anniversary [1] 2418:20 annual [13] 2427:1 2435:13 2436:17 2450:10 2461:4,6,9,10,16,23 2462:10,19,23 annually [1] 2539:14 annum [2] 2435:9 2463:23 another [6] 2422:2 2450:7 2469:21 2513:13 2522:22 2545:17 answer [64] 2440:6 2443:23 2456:21,22,25 2457:1 2476:15 2484:19 2488:1,11,14,23 2489:2 2493:14 2494:8,20 2495:16 2496:2,10,17 2499:12 2500:6 2506:3,8,12 2508:25 2509:1,1,7,12 2510:2,10,19 2511:10,16,20 2512:18,25 2513:9 2514:24 2515:5 2518:5,9 2524:15 2525:15,23 2527:18 2528:1 2530:9 2532:11,16 2533:12 2534:1,3,5,8,11,20,22 2536:13 2537:12,21 2544:14 2548:3 answered [4] 2469:9,24 2515:16 2536:10 answers [8] 2422:13 2436:6 2496:21 2510:2 2511:4 2515:4,4 2538:11 anticipate [8] 2449:13,17 2457:18 2467:3 2518:22 2529:24 2530:4 2531:23 anybody [2] 2423:7 2530:3 Anyway [3] 2418:24 2456:11 2468:22 apologize [1] 2550:8 apparently [1] 2505:10 appear [1] 2449:2 appearance [2] 2417:12 2420:25 APPEARANCES [1] 2415:1 appears [6] 2456:10 2495:17,25 2496:7 2539:23 2540:2 apple [1] 2503:25 apples [2] 2499:24 2504:3 applesauce [1] 2504:3 applicable [3] 2445:15,19 2506:1 Applicant [13] 2419:16 2420:9 2422:4 2423:9,18 2481:4,6,25 2482:23 2497:14 2549:15 2551:6,14 applicant's [1] 2481:20 application [5] 2439:12 2443:11 2444:16,18 2486:16 applies [2] 2488:15 2503:9 apply [2] 2469:21 2508:13 applying [1] 2468:12 apportion [1] 2453:20 approach [2] 2447:5 2538:1 approaches [2] 2502:23 2537:17 appropriate [3] 2494:4 2507:4 2510:8 approval [3] 2441:12 2460:8 2463:10 approve [3] 2460:10,19 2462:15 approved [5] 2429:23,24 2430:2 2459:22 2475:25</p>	<p>approves [2] 2458:14,16 approving [6] 2460:12,13,24,24,25 2484:23 approximate [1] 2463:21 Approximately [5] 2429:22 2430:2,8,10 2450:3 April [2] 2447:4 2448:4 area [12] 2432:3,3 2434:20 2438:12 2454:19,24 2521:22 2524:1 2525:9,13 2535:1,5 areas [8] 2432:2 2488:25,25 2491:4 2510:7 2515:10 2521:21,22 argue [2] 2530:8,24 argument [2] 2526:7 2531:4 arise [1] 2522:6 arises [1] 2519:12 armament [3] 2514:12,16 2516:3 armed [1] 2457:11 around [3] 2523:2,17 2538:21 arriving [1] 2476:24 articulated [3] 2494:22 2535:8 2537:12 articulating [1] 2539:24 aside [1] 2531:16 aspects [2] 2473:10,12 assemblies [2] 2428:19,20 assertion [2] 2516:12 2540:6 assessment [1] 2544:2 assessor [1] 2510:17 asset [2] 2444:4,6 assets [7] 2443:4,6,7,22 2444:13,19 2445:3 assigned [1] 2453:1 assignment [1] 2453:3 ASSISTANT [1] 2415:5 associated [1] 2527:22 Association [1] 2443:14 associations [1] 2438:8 assume [9] 2488:15 2493:6 2508:22 2509:14 2511:12 2521:16 2533:15 2534:21 2545:3 assumed [1] 2522:10 assuming [1] 2476:25 assumption [1] 2454:8 assumptions [2] 2522:14,17 assurance [7] 2446:19 2481:25 2482:9,15,23 2502:6 2539:19 assured [1] 2540:8 Atomic [3] 2414:17,21,25 attached [3] 2424:23 2479:14 2489:17 attachment [2] 2424:2 2480:19 attachments [1] 2490:18 attend [1] 2438:14 attendance [1] 2439:6 attention [3] 2494:7 2496:20 2544:18 ATTORNEY [4] 2415:3,5 2499:2 2532:9 Attorneys [2] 2415:10,15 audited [2] 2444:24 2445:2 authorize [1] 2462:25 authorized [1] 2429:16 automatically [2] 2460:20 2461:19 availability [1] 2547:12 available [6] 2426:1 2438:5 2439:10 2507:15,25 2525:12 award [2] 2418:15,16 aware [11] 2434:24 2457:1,3 2483:10 2498:2,5,10,15 2499:14 2500:23 2516:9 away [1] 2418:15</p>	<p>B b)(b) [1] 2501:3 B-52s [2] 2523:8,9 B18 [1] 2416:4 back [31] 2417:4,19 2418:6 2421:5 2427:23 2432:16 2438:15 2442:9 2444:1 2448:18 2452:5,7,14,22 2456:13,14 2458:22 2461:13 2462:2,6 2467:6 2472:14,17,18 2473:1 2490:16 2491:4,5 2547:5 2548:16 2550:10 back-bill [1] 2462:20 background [1] 2434:20 bad [2] 2533:8,10 balance [8] 2444:5,7,8,12 2464:4,7,12 2477:3 balancing [1] 2544:10 ballpark [1] 2444:19 BAND [3] 2415:18 2486:10,18 band's [1] 2486:13 bank [16] 2440:10 2441:24 2442:13,16 2443:9 2445:16 2447:4,12,16,25 2448:13 2449:4,6,7,10 2465:1 bare [1] 2513:8 Barnwell [6] 2434:22 2435:5,8 2473:4,7 2525:20 base [8] 2428:3 2466:14,20,22,24 2473:19 2477:5,10 base-three [1] 2477:16 based [30] 2421:20 2432:10 2435:24 2439:13,17,18,20 2440:2 2442:6 2444:8 2447:17,18,18 2461:5 2482:4 2490:17 2504:19 2505:16,23,24 2506:18 2507:18 2510:1 2516:12 2525:19,21 2526:4 2537:22,22 2539:15 bases [1] 2446:5 basic [4] 2436:18 2452:4 2494:10 2546:9 basically [14] 2420:12 2429:2 2431:8 2436:16 2437:19 2441:11 2442:23 2462:2,25 2464:3,15,19 2483:17 2500:2 basis [14] 2427:1 2436:17 2446:12,21 2462:10 2468:22 2481:24 2482:8,14 2504:8 2511:2 2530:12 2531:3 2537:2 Battelle [1] 2519:13 becomes [1] 2537:1 beg [1] 2530:16 begin [3] 2417:4 2423:8 2429:19 beginning [3] 2475:19 2494:24 2545:11 begins [2] 2471:2 2545:17 behalf [8] 2423:18 2449:5,7 2451:19 2478:25 2487:9,16 2550:17 belief [2] 2424:6 2480:2 believe [29] 2423:9,13 2430:2 2435:1 2442:3 2453:23 2454:21 2462:24 2463:1 2472:19 2476:14 2482:3 2484:7 2489:13,18 2490:8,16,25 2495:6,14 2496:15 2499:17 2503:17 2510:14,17 2529:6 2534:16 2535:9 2536:9 believes [1] 2422:5 bell [1] 2515:11 belongs [1] 2443:18 beneficial [1] 2490:8 benefit [2] 2486:14,17 best [2] 2424:5 2480:1 better [7] 2437:10,11,13,17 2459:2 2475:2 2515:1 between [8] 2419:17 2435:5 2499:20 2502:24 2513:2 2516:10 2519:21 2539:22 beyond [5] 2454:25 2455:17 2456:9 2457:25 2458:4 bigger [1] 2418:20 bill [5] 2452:7 2460:4 2462:11 2463:1 2464:23 billed [2] 2461:5 2465:6 billion [2] 2507:14,24 bills [1] 2442:24 bind [1] 2540:3 binding [2] 2495:24 2496:24 bit [5] 2421:6 2533:6 2544:8 2545:6 2552:7 Blake [1] 2415:14 Board [42] 2414:17,21,25 2417:14 2421:5 2422:2 2441:12 2449:10,11,12,16 2458:18,20 2459:12,23 2460:8,15,19,23 2462:13,15,18 2463:5,9,10,17 2474:11,13 2478:14 2485:12 2486:3,9 2487:18 2506:7 2510:18 2537:18,18 2538:6 2540:16 2550:7 2551:20,25 Board's [4] 2419:9 2463:1 2510:14 2544:18 Bob [1] 2482:17 boiling [2] 2501:21 2502:11 BOLLWERK [122] 2414:15 2417:3 2418:19 2419:1,12,16,19 2420:6,14 2421:3,11,17 2422:17 2423:14 2424:19,21 2426:3 2427:17 2447:7 2448:21,24 2456:5,22 2468:13 2469:12 2472:10,13,17 2474:3,7 2476:5,11 2478:7,10,12,20 2480:11,14,16 2481:1,6,11,15 2483:3,6,12,15 2484:2,24 2485:11,23 2486:2,19,22 2487:2 2490:3,5,14 2491:7,13,19,23 2492:11,15 2493:1 2499:11 2504:6,11 2506:5 2508:14 2510:9,20,24 2512:5,13,17 2518:2 2524:24 2525:1 2526:1,13,23 2527:2,12 2529:13,18 2530:2,13,18,25 2531:6,10,14,21 2532:1 2534:4 2535:20,23 2536:6 2537:6,9 2538:4,15,19,23 2539:6 2540:13,16 2545:9 2549:6,10,13,15,17,20,25 2550:3,6,12 2551:12,18 2552:5 bond [4] 2482:10 2485:16,17,24 both [10] 2417:13,24 2418:24 2435:11 2466:21 2481:20 2493:22 2495:3 2504:2 2514:11 bottom [4] 2493:14 2494:8 2504:14 2523:17 bound [3] 2480:20 2492:17 2503:12 breached [1] 2519:1 break [10] 2472:12,14,19 2492:12 2529:17,23 2530:3 2536:4 2550:3 2552:6 brief [2] 2418:4 2483:6 bring [4] 2419:25 2422:11 2438:15 2547:8 bringing [1] 2518:1 Broadway [1] 2415:20 broke [1] 2417:11 broken [2] 2520:13,25 brought [3] 2438:19 2487:4 2498:16 budget [10] 2460:10,11,16,20,24 2461:2,7 2462:19 2463:5,9 bulk [1] 2496:10 burial [3] 2432:25 2434:3,21 burn [1] 2523:17</p>
--	---	---

<p>burn-up [1] 2515:18 burst [2] 2521:1,2 business [3] 2476:23 2477:25 2478:2 buy [1] 2438:23</p> <p>C</p> <p>calculate [1] 2440:24 calculates [1] 2444:6 calculation [4] 2444:2 2505:3 2515:22,24 calculations [1] 2509:11 calculator [1] 2509:4 call [8] 2429:4 2478:18 2494:7 2496:20 2501:10 2526:19 2544: 17 2550:10 called [6] 2423:18 2435:3 2437:9 2478:25 2487:9 2550:17 Calls [3] 2454:2 2498:21,23 came [9] 2414:12 2421:22 2453: 4,7,11,15 2483:9 2492:9 2543: 17 canister [3] 2452:25 2461:25 2462:23 cannister [3] 2497:23 2513:12 2516:18 cannister-based [1] 2513:6 cannot [3] 2452:21 2497:11 2547: 4 capability [1] 2434:17 capable [2] 2491:3 2513:25 car [2] 2522:12,23 Carolina [2] 2434:22 2435:6 carrier [1] 2454:13 carry [2] 2475:25 2517:13 case [11] 2436:23 2452:23 2454: 14 2475:1 2477:25 2485:18 2494:1 2498:1 2501:18 2520:9 2534:21 cases [1] 2522:3 cash [6] 2444:7 2464:3,5,25 2465: 4 2546:1 cask [16] 2451:5,6 2452:25 2472: 5 2477:4 2482:11 2484:10,12 2497:23 2512:24 2514:11 2515: 6 2520:24 2523:17 2535:13,14 casks [32] 2453:9,19 2462:4 2471:1,18,19 2472:1 2481:21 2512:23 2513:2,2,4,7,18,20,23 2514:2,4,5,14,15 2515:7,12 2516:1,21 2517:1 2518:12 2519: 5,6 2521:20 2536:23 2544:21 categories [4] 2432:23 2446:2 2520:25 2540:5 category [6] 2446:23,25 2460:5, 6 2461:13 2522:8 Catherine [1] 2426:10 cause [1] 2483:9 caused [9] 2451:18 2453:10,19 2454:9,10,14 2455:7 2542:6 2543:11 ceasing [1] 2467:9 certain [16] 2433:8 2434:11 2436: 4,19,19,22 2443:12 2466:8 2468: 25 2499:9,10 2517:1 2521:6 2524:10 2539:11 2540:7 certainly [19] 2417:24,25 2438:6 2449:23 2457:2 2459:8 2467:11 2469:22,24 2471:22 2491:3 2496:20 2504:10 2506:7 2511: 14 2514:15 2518:20 2534:7 2542:4 certainty [1] 2494:15 cessation [1] 2429:2 CFR [1] 2476:17 Chairman [5] 2424:14 2446:4</p>	<p>2467:23 2469:8 2510:1 challenge [2] 2517:17,21 chance [1] 2545:5 Chancellor [80] 2415:4 2416:17, 21 2419:4 2420:13 2421:8,15,22 2427:20 2446:8,23 2447:3,8 2448:23,25 2454:5 2455:2,6,13, 19 2456:3,13,17 2457:16 2460:3 2461:11 2462:13 2463:13 2468: 4,17 2469:14 2470:3 2472:7 2474:4,6 2486:23 2487:13 2489: 11,25 2490:13,15 2491:14 2492: 8,13 2498:21 2499:1 2501:15 2502:15 2503:4,14 2504:4 2505: 19 2508:11 2510:12,23,25 2515: 15 2516:22 2517:16 2522:13 2523:19 2524:9,23 2525:3 2529: 16,24 2530:15 2531:11,23 2534: 2,10 2536:3,9 2537:9,10 2538: 17 2539:9 2540:11 2549:8,22 change [5] 2420:23 2437:2 2439: 20 2527:9,13 changed [2] 2489:8 2494:25 changes [16] 2427:4,6 2437:23 2439:17 2490:24 2491:2,15,15, 21 2492:3,6 2496:5 2514:11,12 2539:14,15 changing [1] 2490:18 characteristics [1] 2524:13 charged [1] 2435:10 chickens [1] 2499:25 chipped [1] 2543:12 chooses [1] 2510:19 circumstances [2] 2514:9,10 citation [1] 2535:10 cite [2] 2513:16,21 cited [6] 2512:22 2517:3,5,20 2518:3 2544:24 cites [1] 2517:22 citing [5] 2515:24 2516:4 2517:6 2524:1,3 City [3] 2414:10 2415:7 2525:21 claim [1] 2514:23 Claims [1] 2454:3 clarification [4] 2459:25 2461:9 2465:13 2486:23 clarified [1] 2545:25 clarifier [1] 2477:18 clarify [7] 2449:22 2484:12,20 2485:23 2492:4 2512:14 2545: 15 Class [3] 2434:4,6 2520:25 classes [1] 2520:9 classify [1] 2470:19 clean [17] 2433:14 2437:10 2451: 19 2452:10 2454:9 2487:4 2497: 14,23,24 2509:23 2516:6 2525: 12 2541:25 2542:7 2543:5,14,18 cleaned [3] 2541:15 2542:1 2543: 7 cleaning [7] 2429:19 2430:22 2437:18 2451:25 2452:9,20 2543:22 cleanup [24] 2451:21 2453:3 2462:10 2493:11 2497:18 2498: 4 2499:19 2504:1 2508:9 2510:4, 5 2519:11,21 2520:23 2532:17 2533:15,22 2537:3 2540:22 2541:20 2542:13,16,20,25 clear [9] 2422:16 2473:9,17 2485: 2 2486:16,17 2490:9 2512:18 2540:4 clearly [2] 2422:14 2505:9 clerical [1] 2490:24 close [2] 2440:9 2539:5</p>	<p>closed [1] 2418:7 colleagues [1] 2538:5 collect [2] 2462:2 2547:8 collected [8] 2449:25 2462:4 2464:1 2465:8,10 2477:4,19,21 collecting [4] 2465:16 2468:21 2477:12 2505:18 collection [1] 2476:24 color [1] 2535:17 combined [3] 2547:12,13,13 come [23] 2421:14,15 2422:24 2437:9 2442:9 2459:16 2460:16 2472:14,17 2476:25 2477:2 2489:9 2490:7,10 2491:5 2494:2 2509:9,12 2538:12,23 2543:2,10 2548:23 comes [9] 2418:21 2422:22 2428: 4 2476:20,22 2507:3 2519:15 2526:11 2546:11 coming [6] 2432:22 2439:3,9 2471:21 2491:10 2548:18 commencing [1] 2428:10 commercially [1] 2507:24 COMMISSION [8] 2414:2 2416:1 2417:18 2418:16 2429:14 2436: 24 2458:9 2471:16 commission's [1] 2550:23 commitment [10] 2440:12,15 2441:19 2442:5,20 2486:11,20 2495:25 2496:7 2540:3 commitments [3] 2496:13 2539: 11,20 commits [1] 2448:12 committed [2] 2466:3 2539:13 committing [2] 2439:22 2440:1 common [3] 2458:23 2459:1 2500:11 communication [1] 2438:24 community [1] 2438:25 compact [2] 2431:21 2435:1 company [1] 2431:11 compare [2] 2431:18 2446:13 comparison [2] 2435:4 2502:22 complete [2] 2490:11 2491:11 completed [2] 2471:14 2534:3 completely [4] 2458:1 2473:9 2534:11 2536:10 completion [2] 2446:16,20 compliance [1] 2482:24 comply [1] 2481:21 component [2] 2434:10 2528:10 components [2] 2500:10 2521: 13 comprised [1] 2424:1 concern [4] 2494:10,22 2539:22 2546:23 concerned [1] 2456:7 concerns [1] 2495:8 concluded [1] 2526:8 concludes [3] 2535:20,22 2551: 23 conclusion [3] 2454:3 2496:22 2498:22 conclusions [1] 2496:9 concrete [1] 2500:9 condenser [1] 2434:10 condition [1] 2540:9 conditions [13] 2450:19,21,25 2451:12 2452:16 2458:16,24 2459:5,9 2505:12,13,17 2539:20 conduct [1] 2461:6 conducted [1] 2519:13 conferences [1] 2438:11 confident [1] 2474:18 conform [2] 2550:23 2551:2</p>	<p>confused [2] 2530:18 2531:1 confusion [1] 2486:22 Congratulations [2] 2418:17,24 connection [1] 2499:20 consequences [4] 2493:10 2515:22 2516:11 2518:24 conservatism [2] 2474:16 2537: 16 conservative [5] 2509:13 2521: 14,24,25 2538:1 consider [6] 2427:4,6 2442:21 2443:21 2504:2,5 considerably [3] 2443:16 2473: 6 2475:11 considered [1] 2527:23 considering [3] 2426:17 2440: 19 2449:19 considers [3] 2503:5,11,25 consistent [1] 2517:12 consortium [1] 2458:19 constantly [1] 2437:17 constructed [1] 2466:19 construction [4] 2421:23 2445: 25 2446:25 2467:11 Consumer [3] 2439:14,24 2495: 19 contact [1] 2436:25 contain [1] 2458:23 contaminated [7] 2431:13 2461: 25 2524:1 2525:9,12 2535:1,4 contamination [2] 2434:11,18 2451:16,17,20 2452:1,8,18,21,21, 25 2453:4,7,10,11,15 2454:9 2455:7 2511:8 2519:10 2535:4 contemplate [9] 2427:13 2452: 23 2458:3 2460:14 2467:6,20 2468:18 2469:5 2470:17 contemplated [4] 2450:2 2458: 12 2464:2 2492:2 Contention [38] 2417:20,21 2418:3,6,10 2419:22 2420:15,17 2421:4 2422:18 2423:9,25 2424: 9,12,17 2446:5 2468:3 2470:1 2478:17 2479:12 2481:19 2484: 17 2486:12 2487:17 2488:1,3,8, 9 2489:17 2491:6 2494:2 2499:3 2509:13 2530:4 2542:9,18 2545: 4 2551:24 contentions [13] 2417:9 2421:2 2422:21 2494:2 2508:19 2509:8, 9,15 2514:25 2516:14 2534:19 2544:16 2545:6 contents [1] 2535:13 context [5] 2498:6,19 2516:7 2542:18 2544:20 contingent [1] 2454:1 continue [2] 2483:19 2503:7 continues [1] 2471:12 continuing [2] 2464:12 2503:2 continuously [1] 2537:14 contract [1] 2467:21 contracting [1] 2468:18 contributions [1] 2475:12 control [2] 2424:3 2456:6 convenience [1] 2530:24 convert [1] 2479:24 cooled [2] 2519:5,6 copied [1] 2492:14 copy [5] 2427:24 2447:3,6 2448: 19 2480:11 core [3] 2429:10,15 2430:12 correct [74] 2420:13,15 2423:3 2424:5 2428:6,7,10,11,16 2436: 9 2438:1,2 2439:14 2441:6,7,25 2442:7 2444:10,16,17 2447:13,</p>
--	---	--	--

<p>14,21,22 2448:1,2,25 2449:4 2450:16 2451:7,8,23 2459:2 2461:3,11 2463:6,7,11 2465:18 2467:16 2470:5 2471:13,18 2475:17 2478:4 2480:1,13 2482: 25 2483:1,17 2484:9 2486:20 2489:14 2493:8,18 2495:8 2497: 19 2502:8 2505:7 2510:10,24 2511:23 2512:7,20 2513:3 2518: 24 2519:5 2521:11 2527:23 2532:19 2533:4 2535:11 2539: 16 2545:23 corrected [1] 2480:10 correction [4] 2479:25 2480:12 2489:11 2492:9 corrections [6] 2479:19 2487:23, 25 2489:22 2490:1 2492:14 correctly [1] 2545:21 correctness [1] 2516:5 corresponds [1] 2521:12 cost [72] 2426:12,15,17 2427:11 2432:6,22 2435:24,25 2436:1 2437:12 2438:23 2439:21 2441: 16 2446:14,24 2451:21 2452:2 2453:20 2460:5,6 2461:24 2462: 10 2463:16,20,21 2470:6,9,10,11, 12,13,14,16,19 2471:10 2472:25 2482:4 2484:13 2488:24 2493: 11,24 2494:14 2495:18,22 2498: 4 2509:23 2510:16 2519:20 2520:17,18,23 2521:6,20 2525: 12,19 2532:17 2537:3 2539:12, 13 2540:22 2541:6,18,20 2542:3, 21 2544:2 2546:18 2547:5 2548: 5,5,12,23 costs [77] 2427:2 2432:13,17 2435:5 2436:5,17 2439:13,17,22, 23 2440:8 2447:1,2 2450:5,6,8, 10 2451:25 2452:8 2453:2 2456: 7 2459:20,22,25 2460:12,18 2461:1,5,7,10,17,21,24 2462:16 2465:6 2470:21 2471:10 2473:2, 3,4,5 2482:7,11 2483:13,20,20 2484:8 2493:11 2494:6,11 2495: 5 2498:13 2499:19 2501:18 2502:23 2503:20,22,25 2504:1 2505:21 2508:9 2510:4,5 2511:8, 13 2519:11,20 2521:19 2524:20 2536:16 2540:22 2542:21 2546: 15,15,16,17,20 couldn't [5] 2431:17 2443:23 2444:20 2522:6 2526:12 counsel [10] 2420:16 2480:18 2483:17 2486:10 2491:19 2499: 4,6,12 2534:11 2552:8 count [1] 2431:24 couple [3] 2477:2 2492:9 2538: 15 course [13] 2429:6 2433:2 2437: 4 2439:1 2443:10,15 2452:7 2454:12 2459:14 2471:1 2490: 21,21 2517:18 court [2] 2480:11 2492:7 cover [10] 2427:3 2440:8 2448: 11,15 2457:20 2467:10,12 2525: 16 2541:22 2548:23 coverage [3] 2463:15 2483:20 2507:13 covered [11] 2450:7,8 2453:13 2455:22 2457:14 2462:3 2470:7, 9,11,22 2542:3 covers [3] 2427:11 2499:19 2525: 11 covert [2] 2479:23,23 cows [1] 2499:24</p>	<p>crash [3] 2522:25 2523:4,16 crashed [1] 2523:23 credit [87] 2427:11 2440:7,11,13, 18,20 2441:2,14,20 2442:1,2,3,4, 6,11,14,16,18,21 2443:9 2445:7, 8,11,15,20 2446:3,9,11,12,25 2447:4,11,16,17,20 2448:6,8,9, 12,14,16 2449:1,5,24 2450:2,6,7 2452:6 2461:15,20 2463:4,21,22, 23,24 2464:2,5,6,8,9,10,13,20 2465:3 2485:17,24 2495:4 2496: 3 2546:2,10,12 2547:7,11,13,19, 20 2548:1,9,11,17,21 2549:2 2550:22,24 2551:2,3,7 crew [1] 2430:24 Cross [2] 2428:5 2551:12 Cross-Examination [31] 2416: 10 2419:7,10,11,24 2420:5,10,22, 23 2421:18,20 2422:19 2426:2,6 2427:18,19 2481:3,5,9 2484:5 2490:10 2493:2 2517:23 2526:3, 24 2527:14 2530:19 2531:2,5 2532:6 2538:11 cross-examine [1] 2419:8 Crosse [21] 2428:9,13,15 2429:1 2430:17 2431:15,24,25 2433:3,4, 23,25 2434:13 2435:19,21,25 2438:6 2441:24 2447:5 2475:1,5 cruise [6] 2454:22 2457:4,5,7,8, 10 cubic [1] 2473:6 curiosity [1] 2539:3 CURRAN [10] 2415:9 2476:9,13 2478:6 2481:8 2484:4,6,18 2485: 6 2551:15 current [9] 2440:16 2442:7,24 2443:22 2444:19 2445:6,8 2448: 7 2539:24 Currently [5] 2435:7 2441:16 2443:10 2451:2 2468:12 curriculum [2] 2424:23 2489:16 customer [20] 2450:23 2451:13, 18,20 2452:11,18,22 2453:14 2457:21 2459:6,10 2461:1 2466: 7,11 2467:21 2468:19,23 2469:6 2472:2,4 customer's [2] 2451:19 2471:24 customers [14] 2450:14 2451:7 2459:20 2460:7,21 2461:5,22 2462:12,16 2465:5,22 2473:21 2482:13 2495:23</p>	<p>dealing [9] 2421:12 2428:9 2456: 9,11 2496:11 2502:19 2507:2 2522:5 2528:11 dealt [2] 2518:11 2544:6 debt [1] 2442:25 debt-free [1] 2443:2 December [3] 2488:12,13,21 decided [2] 2463:17 2527:4 deciding [1] 2545:4 decision [2] 2440:20 2472:2 decline [1] 2546:3 declined [1] 2545:22 decommission [9] 2431:6 2437: 21 2461:16 2462:22 2471:7 2481:20 2500:1 2541:24 2546: 19 decommissioned [3] 2431:2 2458:2 2541:12 Decommissioning [159] 2423: 25 2426:12,15,23 2427:2,11 2428:4 2429:4,22,25 2430:6,10 2431:7 2432:6,18,22 2433:16 2436:1,5,17 2438:13,21 2439:20 2441:15 2446:1,13,17,20 2447:1 2450:5,10,15 2451:5 2453:16,17 2456:7 2457:15,22 2458:5,6 2459:21 2461:10,17,23,24 2462: 4,20 2463:16 2465:1,6,9,10,12, 15,17 2468:10,21 2469:1,25 2470:5,8,10,12,14,21,23,24 2471: 1,4,6,10,14 2473:13,22 2474:23, 25 2475:8,21,23,25 2477:1,6,20 2479:12 2482:7,11 2483:13,19, 20 2484:8,13 2493:18,23 2494:7, 9,11,17 2495:5,18,21 2496:16 2497:9,15,19 2498:3,18 2499:9, 10,15 2500:18,24 2501:6,14,17 2502:6,22,23 2503:21,25 2504: 17,24 2505:18 2506:17 2507:20 2514:22 2524:19 2529:7,9 2540: 22 2541:2,3,6,11,13,16,18 2542: 2,3,5,7,12,13,15,22,23,24 2543:4, 6,7,15,16,18,20,21 2546:15,20, 21 2548:13 2551:7 decontaminating [1] 2429:19 decontamination [3] 2430:22 2434:9 2453:16 defer [1] 2419:22 deficit [2] 2446:14 2451:5 define [4] 2498:3,18 2499:8,10 defined [1] 2541:19 defines [2] 2497:9 2499:17 Definitely [5] 2439:25 2452:19 2459:4 2465:19 2475:2 definition [9] 2431:5 2443:5,7 2455:15 2497:18 2499:15,23 2542:12,15 definitions [1] 2502:25 defuel [1] 2429:11 degree [5] 2434:19 2460:16 2499: 12 2518:5 2537:15 delicensing [1] 2467:9 delivery [5] 2459:7,15 2465:21 2466:2,3 Delligatti [1] 2416:3 demand [1] 2540:21 demonstrate [2] 2502:5 2551:8 Denise [1] 2415:4 Department [1] 2471:2 depend [2] 2443:5 2461:12 depends [3] 2431:5 2455:19 2529:22 deposition [7] 2501:5 2509:4,20 2510:15,21 2511:2,5 deposits [1] 2464:3</p>	<p>derive [1] 2461:24 describe [3] 2436:6,11,14 described [3] 2463:25 2480:17 2485:1 description [1] 2464:17 design [4] 2443:16,17 2444:21 2516:18 designed [5] 2513:23 2514:3,8 2515:7 2516:2 detail [7] 2431:8 2496:19 2497: 22,25,25 2508:17 2517:24 detailed [1] 2434:17 details [1] 2518:6 detectors [1] 2437:16 determination [2] 2482:19 2515: 2 determine [1] 2543:6 determined [4] 2453:2 2473:2 2482:14 2522:2 determining [1] 2514:21 developed [1] 2439:9 devoted [1] 2438:11 difference [5] 2423:4 2513:11 2515:21,23 2518:19 differences [1] 2516:9 different [23] 2417:15 2421:7,24 2431:10 2432:24 2437:3 2458:5 2469:13 2499:18 2500:5,8,12,21, 21,22 2503:5,11 2508:5,6,21 2511:15 2523:7 2544:21 differently [2] 2498:19 2499:17 difficult [2] 2427:9,14 difficulty [1] 2440:23 diminish [1] 2464:5 diminishing [1] 2464:22 dinner [1] 2418:22 Direct [8] 2416:13 2423:21 2424: 3,25 2479:3 2480:21 2492:4,18 direction [2] 2456:8 2487:21 directly [3] 2421:13 2435:15 2486:12 director [1] 2540:1 directors [1] 2449:12 disadvantage [1] 2422:1 disagreement [1] 2502:24 disassembly [1] 2429:20 discovery [6] 2511:20,21,22,24 2512:6,11 discretion [1] 2471:24 discuss [2] 2438:17 2455:4 discussed [3] 2422:24 2459:11 2474:25 discussion [3] 2418:4 2426:21 2498:8 discussions [1] 2486:10 dismantling [1] 2430:23 dismissed [4] 2474:9 2478:13 2486:5 2551:19 dispersed [1] 2523:18 display [1] 2438:22 displays [1] 2438:19 disposal [6] 2434:13 2435:5,10, 14 2472:25 2525:21 dispose [1] 2434:24 disposition [1] 2428:9 dissimilarities [1] 2500:17 distinguishing [2] 2513:1 2539: 22 distributed [1] 2455:25 document [8] 2423:23 2424:2,15 2479:5 2487:15 2490:11 2529: 19 2539:1 doing [11] 2433:20,21,21,25 2436:12,25 2466:4 2501:2 2531: 5 2539:25 2543:14</p>
---	---	---	--

<p>dollar [2] 2464:22 2477:20 dollars [25] 2426:14 2437:22 2440:16 2441:5,21,21 2442:6,7 2447:18,23 2448:7 2479:23 2495:9 2497:5 2501:19,22 2502: 5 2504:19 2505:2,6 2506:22,25 2516:5 2519:22 2532:19 dominant [1] 2437:6 done [15] 2431:14,25 2433:15 2436:24 2440:17 2444:2,22 2452:24 2453:4 2464:14 2501:2 2513:22 2526:2 2533:1 2542:4 doubt [1] 2462:17 down [18] 2428:25 2436:18 2439: 3 2452:9 2464:2 2485:20 2488: 11 2489:2,13 2500:3,20 2520:13, 25 2523:10,11,14 2548:17 2549: 3 draft [2] 2442:2 2448:15 drafted [2] 2451:1 2491:14 drafting [1] 2451:2 draw [1] 2452:6 due [4] 2466:21,22,24 2541:20 duly [2] 2423:19 2479:1 during [7] 2417:14 2433:5 2461: 14 2483:8 2490:21 2492:9 2543: 5</p> <p style="text-align: center;">E</p> <p>E/Confederated [2] 2417:11 2418:9 each [13] 2436:7 2438:19 2450: 22 2451:13 2452:17,24 2457:19 2458:21 2459:6 2460:4,12 2481: 23 2507:14 earlier [5] 2429:5 2457:23 2461: 13 2465:20 2536:12 earthquake [2] 2453:6,8 earthquakes [1] 2508:20 East [1] 2415:6 effect [5] 2433:4 2443:1 2467:10 2473:22 2475:23 eighty [2] 2501:23 2502:9 either [8] 2419:12 2422:10 2429: 23 2442:9 2448:11 2494:9 2507: 11,14 element [2] 2481:19 2520:4 elements [8] 2432:24 2437:3 2470:25 2520:2,4,5,14,16 elicit [1] 2503:19 eliminate [1] 2520:8 elsewhere [2] 2533:2 2542:17 emphasized [1] 2457:10 employ [1] 2440:2 encouraged [1] 2438:6 end [7] 2449:18 2458:13 2467:15 2471:3,8 2496:1 2541:15 ended [1] 2497:16 Energy [1] 2471:3 enough [4] 2482:23 2548:15,22, 25 enrichment [1] 2515:18 ensure [2] 2439:5 2541:11 entails [1] 2496:7 entered [4] 2424:23 2490:2,12, 25 entire [5] 2432:3 2457:21 2491:5 2521:9 2547:5 entitled [3] 2423:24 2487:15 2518:4 entity [3] 2427:10 2442:18 2443: 2 equity [1] 2443:1 era [4] 2429:5,18 2432:9 2433:5 ergo [1] 2460:25 Ernest [1] 2415:14</p>	<p>escalate [1] 2441:17 escalated [4] 2442:6 2448:7 2450:9 2477:20 escalation [3] 2426:17 2462:2 2495:14 escalators [1] 2539:15 escrow [10] 2464:25 2475:20 2546:1,10 2547:15,16,25 2548:9, 10,24 escrowed [3] 2461:16 2464:1 2548:23 especially [1] 2456:10 Esq [5] 2415:4,14,19 2416:2,3 essentially [1] 2482:14 establish [5] 2517:14 2530:11 2531:2 2548:16 2549:1 estimate [9] 2444:19 2462:9 2472:25 2493:9 2510:4 2519:11, 15 2533:18 2536:15 estimated [6] 2493:10 2515:8 2534:25 2546:15,20 2548:5 estimates [13] 2426:12,15 2427: 11,12 2436:1 2482:4 2488:24 2495:18 2520:19,23 2525:18,19, 21 estimating [2] 2537:2 2544:2 estimator [1] 2493:12 evaluate [2] 2437:12 2482:8 evaluated [1] 2482:4 even [3] 2473:23 2515:4 2544:7 evening [1] 2417:13 event [12] 2418:20 2429:9 2453: 18 2454:14 2470:17 2504:6 2508:9 2522:24 2524:11,13 2527:23 2536:16 events [4] 2513:14 2516:18 2517: 1 2551:9 everybody [1] 2547:5 everyone [3] 2417:3 2551:24 2552:9 everything [1] 2439:8 evidence [8] 2455:24 2490:2,20 2516:16 2524:11 2536:25 2537: 4 2551:25 evidentiary [2] 2417:5,8 exact [2] 2430:20 2475:13 exactly [2] 2468:14 2544:25 Examination [15] 2416:11,13,14 2420:1,1,8 2423:21 2472:21 2479:3 2485:14 2487:12 2526:8 2539:8 2550:20 2551:13 examine [1] 2436:18 examined [4] 2423:19 2479:1 2487:10 2550:18 example [6] 2421:23 2439:21 2450:4 2461:4 2463:3 2539:12 exceed [2] 2547:16,21 exceeded [1] 2525:10 except [1] 2474:11 exception [2] 2484:22 2492:8 excess [1] 2465:15 exclude [3] 2542:13,16 2543:10 exclusion [1] 2456:1 exclusions [1] 2455:10 Excuse [3] 2455:3 2459:24 2461: 8 excused [2] 2531:8,25 executed [1] 2441:22 exercise [2] 2437:23 2453:19 exercises [1] 2454:23 exhibit [2] 2424:2 2489:17 exhibits [1] 2490:18 exist [1] 2467:9 existence [1] 2467:5</p>	<p>existing [2] 2437:25 2475:3 expect [2] 2445:18,22 expected [1] 2546:3 expenditure [1] 2460:13 expenditures [2] 2444:7 2460: 25 expense [3] 2444:11 2461:2 2543:4 expenses [2] 2444:9 2527:22 expensive [3] 2435:7 2440:3 2473:4 experience [6] 2427:9 2428:3 2482:5 2504:19 2505:16 2506: 20 expert [5] 2499:3 2509:17,20 2510:7 2517:20 expertise [3] 2544:1,3,5 explain [2] 2440:10 2546:6 explained [1] 2441:17 explanation [2] 2486:13 2538: 13 explore [2] 2503:2 2517:8 extend [3] 2457:25 2464:10 2469: 10 extensive [2] 2438:11,18 extent [22] 2454:6 2457:12 2463: 8 2494:12 2495:8,24 2496:6,24 2500:17 2503:16 2508:4 2513: 12,24 2518:21 2522:19,23 2523: 1 2529:8 2539:21 2540:6 2542: 20,23 external [4] 2462:8 2475:23 2477:7 2516:17 externally [1] 2475:20 extra [3] 2452:14 2543:1 2547:8</p> <p style="text-align: center;">F</p> <p>F-111s [2] 2523:8,9 face [1] 2494:1 facilities [7] 2428:4 2482:6 2499: 18 2500:1,8,11 2541:10 facility [31] 2434:12,22,23,24 2435:6 2440:21 2451:16,18 2457:22,23 2466:12 2467:8,9,18 2468:11 2471:4,9 2484:14 2500: 16 2507:1,5 2522:6 2527:21 2528:3,5,7,22 2529:4 2535:3 2536:17 2541:12 facility's [1] 2466:18 fact [14] 2437:13 2441:19 2452:3 2502:14 2503:13 2505:24 2509: 9 2511:1 2519:22 2522:22 2536: 21 2537:4 2544:10,18 factor [1] 2442:17 factors [2] 2442:12 2495:14 facts [1] 2422:12 failure [1] 2497:25 fair [2] 2422:15 2443:21 fairly [1] 2514:10 fall [1] 2482:6 falls [1] 2540:6 familiar [4] 2501:6 2504:20,23 2507:7 far [9] 2432:24 2433:7 2458:11 2475:3,8 2505:13 2510:5 2519: 10 2541:1 fear [1] 2531:7 feasible [1] 2431:3 federal [6] 2453:22,23,24 2454:3, 6,14 fee [16] 2435:10,13 2445:6,9,10, 15,19,23 2446:2 2463:3 2464:4, 7,8,11 2473:1,3 feel [1] 2481:14 fees [1] 2435:11 fell [1] 2461:13</p>	<p>felt [1] 2421:25 few [9] 2461:14 2471:5 2472:23 2475:10 2517:25 2530:11,23 2531:19 2532:10 fewer [1] 2520:16 fifth [2] 2488:11 2489:2 fighter [1] 2522:25 figure [2] 2468:10 2523:5 figures [10] 2495:4,5,5,6 2497:4 2502:11 2507:10,18 2523:6 2547:23 final [11] 2429:4 2432:1,2 2451:2 2458:6,8 2471:4 2473:20 2475:7 2492:13,14 finally [1] 2458:1 financial [5] 2444:3,25 2445:1,4 2482:9 find [11] 2438:3 2442:10 2487:4 2496:19 2519:16,25 2526:10,20 2528:21 2529:3 2548:12 findings [1] 2491:12 fine [3] 2430:21 2435:16 2530:25 finish [5] 2418:6 2495:11 2530:2 2534:4 2539:2 finished [3] 2418:3 2530:19 2550:1 firms [1] 2436:25 first [27] 2419:8,24 2423:10 2429: 21 2449:18 2450:1 2452:2 2454: 9 2460:7 2461:3,14 2466:18 2477:2 2479:1 2488:7,8 2490:9 2495:2 2504:22 2508:25 2511: 10,18 2520:8,25 2521:8 2536:4 2540:24 fit [1] 2537:20 five [13] 2442:14 2467:14 2487: 25 2501:25 2502:3,9 2504:18 2505:2 2506:21 2508:3 2529:25 2538:19 2549:19 five-year [2] 2467:15 2475:11 fix [1] 2541:3 Floor [2] 2415:6,20 flow [1] 2477:4 fly [3] 2523:9,11,14 flyway [1] 2457:13 folks [1] 2498:16 follow [5] 2420:5,10 2421:1 2422: 5 2456:25 follow-up [1] 2476:9 following [1] 2484:18 follows [4] 2423:20 2479:2 2487: 11 2550:19 foot [1] 2473:6 forever [1] 2463:22 form [1] 2439:4 formula [1] 2502:12 forth [3] 2424:8 2491:24 2521:5 found [3] 2479:21 2482:6 2517: 11 four [3] 2477:12 2488:25 2504:18 Fourth [1] 2415:20 framework [1] 2544:7 free [2] 2506:3,5 Friday [2] 2417:13,24 front [7] 2427:25 2442:8 2447:10 2482:13 2484:8 2487:14 2520: 20 Fuel [60] 2417:5,17 2428:10,12, 14,19,20 2429:10,10,15 2430:11, 25 2431:1,3,10 2441:14 2443:14 2457:21,23 2462:21 2465:5,25 2466:7,23,25 2467:22 2468:19, 22,24 2469:2,7 2471:12,25 2473: 24 2483:18 2486:14 2508:22 2513:8,24 2514:1,3,8 2515:7,18</p>
---	--	--	---

<p>2516:19 2518:15,15,20,21,22,25, 25 2520:24 2522:25 2523:4,16 2546:11 2547:6 2548:15,22 full [5] 2472:3,4 2522:12 2530:9 2532:16 fully [2] 2534:11 2536:10 fund [15] 2462:8 2475:1,8,23 2477:7 2494:17 2501:6 2504:17, 24 2505:18 2514:22 2543:21,21, 21 2549:1 funding [16] 2426:23 2427:2 2439:23 2440:2 2441:15 2446: 15,20 2470:8 2474:16 2475:15 2479:12 2493:23 2500:24 2507: 20 2529:7 2551:7 funds [23] 2439:20 2446:14,16 2451:5,6 2454:8,12 2474:23 2475:3 2476:18 2493:18 2494:7, 9 2496:16 2497:14 2502:6 2506: 18 2541:3 2546:11,14 2547:7,12 2551:8 further [21] 2421:19 2423:19 2427:15 2472:7 2476:5 2478:7 2483:3 2485:3,6,10 2487:12 2489:13 2491:7 2493:4 2526:23 2527:16 2539:8 2540:12 2549:6 2551:17,18 future [17] 2420:20 2446:19 2477: 20 2523:14 2551:9</p> <p>G</p> <p>gave [4] 2508:2 2511:19 2520:9 2521:12 GENERAL [5] 2415:5 2462:14 2528:6,18 2541:4 GENERAL'S [1] 2415:3 generally [6] 2500:23 2504:23 2506:20 2507:15 2544:4,5 gentleman [2] 2481:2 2485:13 gentlemen [3] 2486:4 2550:12 2551:19 gestures [1] 2456:18 getting [8] 2431:8 2437:17 2446: 6 2455:10 2463:13 2500:18 2501:23 2517:2 give [14] 2423:6 2444:19 2455:13 2504:12 2510:18 2516:6,24 2521:9,23 2526:6 2527:6 2532: 25 2536:6 2537:19 given [19] 2419:8 2431:3 2466:11 2475:24 2492:6 2493:25 2494: 15 2505:10 2509:9 2511:4,4 2516:3 2527:12 2533:1,5 2534: 18 2537:11 2544:11 2545:11 gives [1] 2544:21 glad [2] 2520:7 2526:19 glass [1] 2487:4 global [4] 2460:10 2462:18 2481: 24 2541:4 GOSHUTE [1] 2415:18 got [9] 2462:7 2463:1 2500:13 2504:21 2506:11 2525:2 2540: 23 2542:1 2549:3 government [6] 2453:22,24,24 2454:6,15,15 gradual [1] 2543:13 grant [3] 2440:17,20 2441:14 granted [1] 2443:12 great [3] 2457:4 2517:24 2523:6 greater [5] 2434:4,6 2440:8 2510: 5 2519:10 grossly [1] 2422:7 ground [5] 2500:10 2536:19 2541:10 2543:1,5 grounds [1] 2536:14 grow [2] 2547:19 2548:1</p>	<p>growing [1] 2475:11 grows [1] 2437:23 growth [2] 2475:4,9 guarantee [1] 2547:7 guess [14] 2417:8 2418:13 2421: 6 2430:19 2431:5 2440:14 2443: 5 2444:1 2450:11 2465:24 2468: 20 2493:1 2529:19,22 guidance [3] 2498:2,12 2551:3 guidelines [1] 2475:3 guy [2] 2509:4,21 guy's [1] 2498:24</p> <p>H</p> <p>Half [2] 2431:22 2466:23 hand [2] 2465:4 2547:25 handing [1] 2424:14 handle [2] 2491:20 2494:18 handout [1] 2438:16 handy [1] 2522:24 Hanford [9] 2435:2,2,6,7,10,14 2473:1,2,3 happen [4] 2511:16 2521:15,16 2523:15 happened [4] 2420:2 2429:22 2541:23 2543:2 happening [1] 2470:17 happens [4] 2422:13 2508:12,13 2528:7 happy [2] 2456:2 2489:8 hard [1] 2537:10 hardware [1] 2439:4 HARMON [1] 2415:9 head [3] 2485:19 2552:2,4 health [4] 2438:12,14 2481:23 2514:20 hear [8] 2417:19 2418:8 2419:23 2420:4,14,21 2492:2 2536:1 heard [8] 2417:8,15 2483:7 2491: 16,23 2503:10 2518:2 2545:13 hearing [2] 2414:12 2417:5 heavily [2] 2437:5 2457:10 held [2] 2426:21 2498:8 Hello [2] 2479:5 2550:22 help [1] 2460:22 hide [1] 2540:18 high [4] 2434:3 2523:16 2547:20 2548:22 high-cost [1] 2525:18 higher [6] 2441:22 2460:18 2461: 24 2519:11 2525:18 2548:1 himself [1] 2495:13 history [1] 2445:17 hold [3] 2438:10 2449:14 2551: 15 holder [1] 2545:7 Honor [33] 2419:4 2420:13 2421: 9 2446:8 2447:6 2456:4 2463:14 2468:4 2472:8 2474:4 2489:25 2490:13,15 2502:15 2508:12 2510:13 2516:22,23 2517:16 2523:20 2526:2 2529:17 2530:7, 15 2531:11,24 2532:3 2536:5 2538:14,18 2544:14 2549:8,24 HONORABLE [1] 2414:15 hopefully [3] 2439:6 2506:16 2538:20 Hotel [1] 2414:8 hotter [2] 2518:21,21 hour [1] 2452:9 hours [2] 2433:8 2452:14 However [3] 2495:17 2541:7 2546:14 hundred [14] 2462:5 2469:1 2501:23,25 2502:3,9,9,10,10 2504:18 2505:2 2506:21 2508:3</p>	<p>2537:20 hundreds [1] 2505:1</p> <p>I</p> <p>idea [5] 2435:4 2468:8 2514:23 2524:6 2546:13 identified [1] 2424:15 identify [1] 2479:9 ignored [1] 2542:14 II [1] 2520:4 III [3] 2414:15 2519:25 2520:5 imagine [3] 2508:16 2537:10 2548:4 immediately [8] 2451:21 2452:5, 7,12 2453:1,4 2477:7 2547:5 immunity [2] 2453:25 2454:4 impact [6] 2481:22 2513:16 2521: 1,1,2 2524:19 impervious [2] 2513:18 2517:1 important [3] 2504:7 2514:17,20 inadequate [2] 2462:23 2465:9 inappropriate [1] 2503:17 inbound [1] 2471:21 include [5] 2437:14 2497:9,18 2498:3,13 included [6] 2463:16 2473:1,2,5 2480:18 2529:10 including [7] 2432:2 2435:13 2444:15,18 2523:8 2537:12 2544:13 inclusion [1] 2540:21 income [3] 2444:9,11 2462:7 incoming [1] 2453:1 incorporated [2] 2424:16 2489: 19 increase [24] 2427:10,12 2439: 13,16,19,22 2440:1,12 2442:13 2445:19 2446:9,11 2450:5,15 2459:21 2461:4,4,19 2476:18 2477:24 2495:22 2546:20 2547: 11 2548:5 increased [2] 2461:7 2463:4 increases [8] 2439:18 2462:16 2463:16 2465:6 2495:23 2539: 11,13,15 increasing [1] 2448:13 increment [1] 2433:1 incur [1] 2461:3 indeed [2] 2495:8 2525:7 indefinitely [1] 2523:18 Indelibly [1] 2481:11 independently [2] 2436:23 2475:21 Index [3] 2439:14,24 2495:19 INDIANS [1] 2415:18 indicate [2] 2446:15 2544:19 indicated [2] 2441:1 2544:1 indicates [1] 2506:25 indication [2] 2516:6 2544:22 indicator [1] 2543:9 individual [3] 2459:10 2460:4 2482:11 individualized [1] 2466:11 individually [7] 2459:6,10,13,17 2465:22 2466:6 2473:11 individuals [2] 2417:15 2459:12 indulgence [1] 2486:9 industrial [11] 2527:19,20,21 2528:3,5,7,9,9,12,20,21 inflation [4] 2426:19 2441:18 2475:4 2495:18 information [8] 2482:18 2491:25 2504:13 2506:8 2510:12 2511: 22 2536:19 2537:14 initial [4] 2445:23 2451:25 2454: 12 2464:9</p>	<p>Initially [2] 2434:15 2490:9 input [2] 2509:11 2515:1 inquire [1] 2455:21 inquiring [1] 2491:3 inserted [3] 2425:2 2480:23 2492:20 Installation [1] 2414:6 instance [12] 2436:19 2452:2 2453:20 2454:9 2460:7 2461:3 2516:20 2522:24 2523:8 2540: 25 2546:24,24 instead [1] 2502:9 insufficient [1] 2542:2 insurance [31] 2449:1,2 2453:13 2454:13,17 2455:9,9,20,22 2456: 1 2457:14 2470:7,10,11 2493:17, 23 2494:3,6,9,14,17 2496:16 2503:23 2504:1 2507:8,21 2508: 8 2525:11 2541:22,25 2542:2 insured [1] 2540:8 intact [1] 2546:7 intend [6] 2426:18,22 2427:1 2429:7 2473:18 2517:24 intends [2] 2461:6 2471:18 intent [3] 2452:5 2475:18 2546:7 intention [3] 2422:10,11 2452:20 interest [1] 2477:12 interested [1] 2539:3 interfere [1] 2460:15 interrupting [1] 2534:12 intervening [1] 2514:13 invested [2] 2475:4,17 investment [1] 2462:7 investments [1] 2462:3 invited [1] 2417:24 invoked [1] 2453:25 involve [8] 2494:15 2512:22 2513:4,5 2522:21 2528:14,23 2529:5 involved [10] 2428:13,25 2433:7 2452:9 2500:15 2512:24 2513:7 2515:19 2516:5 2519:4 involves [2] 2500:18 2540:25 involving [8] 2496:16 2521:4,13, 20,20,22 2528:17 2541:5 irregardless [1] 2469:2 irrelevant [3] 2470:18 2517:7 2543:23 ISFSI [6] 2498:7,14,20 2499:22 2503:6 2508:13 ISFSI's [1] 2482:5 isn't [2] 2443:3 2448:25 2449:4, 9 2454:18,22 2471:18 2476:25 2505:15 2511:22 2512:6,6 2516: 8,19 2519:19,22 2520:16 2522: 10 2525:10 2527:25 2543:3 issuance [1] 2464:9 issue [9] 2421:25 2442:5 2447: 12,17 2481:18 2496:25 2497:8 2516:15 2542:17 issued [2] 2440:13 2445:11 issues [6] 2489:9 2490:7,8,17 2496:11 2538:7 Item [5] 2426:4 2460:14,14 2461: 2 2463:8 itself [3] 2454:4 2547:20 2548:1</p> <p>J</p> <p>January [1] 2502:4 JERRY [1] 2414:19 jet [2] 2522:25 2523:3 job [1] 2437:11 jobs [1] 2431:9 JOHN [4] 2416:9 2423:17,24 2425:1 Judge [167] 2414:16,20,24 2417:</p>
---	---	---	---

3 2418:19 2419:1,12,16,19 2420:6,14 2421:3,11,17 2422:17 2423:14 2424:19,21 2426:3 2427:17 2447:7 2448:21,24 2456:5,22 2468:13 2469:12 2472:10,13,17 2474:3,7,14,21 2475:5,15 2476:4,5,8,10,11,14 2478:7,9,10,11,12,20 2480:11,14,16 2481:1,6,11,13,15,17 2482:22 2483:2,3,4,5,6,12,15 2484:2,18,24 2485:11,23 2486:2,19,22 2487:2 2490:3,5,14 2491:7,13,19,23 2492:11,15 2493:1 2499:11 2504:6,11 2506:5 2508:14 2510:9,20,24 2512:5,13,17 2518:2 2524:24 2525:1 2526:1,13,23 2527:2,12 2529:13,18 2530:2,13,18,25 2531:6,10,14,21 2532:1 2534:4 2535:20,23 2536:6 2537:6,9 2538:4,15,19,23 2539:6 2540:13,16,18,24 2541:17 2542:8,11 2543:24 2544:5,9 2545:8,9,10,15,19,21,24 2546:6,18,22 2547:10,16,19,24 2548:7,19 2549:4,6,10,13,15,17,20,25 2550:3,6,12 2551:12,18 2552:2,4,5
judgment ^[1] 2482:22
jump ^[1] 2548:6
jumped ^[1] 2474:6
jumps ^[1] 2548:14
June ^[4] 2414:11 2487:17,18 2511:20

K

keep ^[5] 2433:10 2438:3 2439:8 2456:6 2462:9
kind ^[3] 2455:16 2514:15 2522:11
kinds ^[5] 2418:22 2500:8 2508:24 2511:15 2544:21
KLINE ^[24] 2414:19 2476:7,8 2478:10,11 2483:4,5 2545:9,10,15,19,21,24 2546:6,18,22 2547:10,16,19,24 2548:7,19 2549:4 2552:2
knowing ^[1] 2508:17
knowledge ^[5] 2424:6 2428:3 2457:12 2480:1 2517:22
known ^[1] 2442:25
knows ^[2] 2503:15 2518:5

L

L.L.C ^[1] 2414:5
La ^[22] 2428:5,9,13,15 2429:1 2430:17 2431:15,24,25 2433:3,4,23,25 2434:13 2435:19,21,25 2438:6 2441:24 2447:5 2475:1,5
labor ^[11] 2433:7 2435:20,24,25 2436:19,20 2437:5,6 2439:22,23 2452:3
labs ^[2] 2439:2 2519:13
Lake ^[4] 2414:10 2415:7 2427:23 2525:21
LAM ^[25] 2414:23 2474:14,21 2475:5,15 2476:4,14 2478:8,9 2481:12,13,17 2482:22 2483:2 2540:17,18,24 2541:17 2542:8,11 2543:24 2544:5,9 2545:8 2552:4
Lam's ^[2] 2476:10 2484:18
language ^[7] 2442:1,2,10 2447:11,15 2448:5,12
large ^[14] 2494:5 2497:7,9 2498:13 2504:1 2510:6 2511:9 2516:25 2527:21,21 2537:3 2542:13,16 2544:11

largely ^[1] 2496:12
larger ^[2] 2440:22 2442:15
last ^[6] 2417:7 2450:13 2467:18 2493:7,20 2545:16
late ^[2] 2543:17 2552:7
late-filed ^[1] 2484:17
later ^[2] 2442:10 2483:19
Law ^[2] 2415:10,15
lawyer ^[2] 2498:24,25
lead ^[4] 2419:21 2420:1,16 2519:10
lease ^[1] 2443:11
least ^[4] 2421:13 2441:18,20 2541:15
leave ^[6] 2456:2 2467:1,22 2468:24 2496:2 2538:10
leaves ^[1] 2471:12
leaving ^[1] 2546:7
left ^[9] 2457:23 2464:24 2471:5,7 2496:14 2541:9,14 2543:19 2547:3
legal ^[3] 2434:21 2454:2 2498:22
legitimate ^[1] 2503:24
lemons ^[1] 2504:5
length ^[3] 2450:2 2517:4 2537:13
less ^[11] 2435:7 2473:3,6 2477:12 2478:3 2507:16,20 2518:16 2519:2 2521:8 2535:15
letter ^[86] 2427:10 2440:7,11,13,18,20 2441:2,14,20 2442:1,2,3,4,5,11,14,15 2443:9 2445:7,8,10,15,19 2446:2,9,10,12,24 2447:4,11,16,17,20,25 2448:5,8,9,11,12,13,15,15 2449:1,5,24 2450:2,6,7 2452:6 2455:24 2461:15,19 2463:3,20,21,23,24 2464:1,5,6,8,9,10,13,20 2465:3 2485:17,24 2495:4 2496:3 2546:2,10,12 2547:7,11,13,20 2548:1,9,11,16,21 2549:2 2550:22 2551:2,6
letters ^[2] 2550:23 2551:3
level ^[10] 2434:3 2462:18 2500:3 2502:7 2505:6,9,11 2513:13 2515:8 2548:22
liability ^[4] 2525:10,14,15 2541:20
license ^[27] 2429:14 2430:17 2439:12 2443:11,12 2444:6,15,16,18 2449:18 2458:4,10 2468:5,6,8,11 2469:11 2471:15 2473:23 2483:21,22 2486:15,24 2487:1 2539:20 2541:23 2547:2
licensed ^[1] 2540:8
licensees ^[1] 2475:20
Licensing ^[4] 2414:17,21,25 2445:11
life ^[2] 2471:3,9
light ^[9] 2489:5 2505:12 2533:6,8,9,10,11,11 2545:12
likelihood ^[2] 2528:4 2547:25
likely ^[1] 2445:13
limit ^[5] 2449:15 2495:17 2507:13 2521:8 2534:7
limited ^[2] 2417:12 2432:2
limiting ^[1] 2528:25
line ^[23] 2431:7 2461:2 2479:22 2488:2,2,11,15,19,20,21 2489:2 2493:20 2502:16 2503:24 2504:15 2519:24 2520:3,4,4,6 2521:3,8 2544:8
lines ^[3] 2496:11 2520:3,3
list ^[1] 2444:12
listed ^[4] 2441:3,5 2442:20,23
litigated ^[2] 2508:21 2516:15
litigation ^[1] 2420:20

little ^[10] 2421:6 2423:5 2460:23 2488:13 2533:6 2534:8 2545:6 2549:16,17 2552:7
live ^[3] 2491:2 2492:3 2545:12
loan ^[1] 2441:11
LOC ^[1] 2497:4
local ^[2] 2505:12,17
located ^[2] 2452:25 2454:18
location ^[1] 2507:5
long ^[9] 2449:13,15 2465:5 2466:8 2468:23 2469:3 2547:1 2549:17,18
longer ^[1] 2465:3
longest ^[4] 2467:4,21 2468:17 2469:5
longevity ^[1] 2464:13
look ^[21] 2432:23 2436:16 2437:3,8 2443:25 2454:1 2455:8 2478:2 2489:12 2493:14 2497:21 2506:6,10 2519:24 2520:7,12 2526:22 2529:19 2531:20 2538:25 2544:23
looked ^[8] 2474:7 2482:9,18 2504:15 2506:19 2516:20 2519:15 2523:5
looking ^[9] 2443:23 2462:17 2468:5 2471:4 2474:22,25 2487:25 2520:21 2521:14
loss ^[1] 2515:9
losses ^[1] 2515:9
lot ^[8] 2438:13 2467:25 2481:15 2500:12,14,17 2514:18,19
low ^[4] 2434:20 2505:1 2520:17,18
low-cost ^[1] 2525:20
low-level ^[2] 2472:25 2525:20
lunch ^[7] 2418:22 2526:20 2529:22 2531:13 2538:21 2550:3 2552:7
luncheon ^[1] 2552:6

M

made ^[10] 2417:25 2438:25 2440:11,15 2442:19 2476:15 2482:18 2511:1 2539:11 2545:12
magnitude ^[5] 2504:18,24 2533:1,3,4
Mail ^[1] 2416:4
maintenance ^[7] 2446:1 2447:1,2 2452:2,14,15 2470:15
major ^[2] 2429:9 2434:10
managed ^[1] 2475:21
management ^[1] 2475:16
Managers ^[10] 2458:18,20 2459:23 2460:8,19 2462:14,15 2463:5,9,18
Managers' ^[1] 2463:10
manner ^[1] 2475:19
many ^[3] 2458:19 2516:8 2529:25
Marco ^[46] 2416:10,13,14,19 2419:14,20,21 2420:17 2424:20 2426:3,4,7,10,22 2427:15 2432:5 2474:5 2478:18 2479:4 2480:9,13 2481:10 2484:15 2485:1,15 2486:1 2490:4,6 2491:1,8,9 2526:25 2527:11,17 2529:11 2531:18,19 2532:9 2540:15 2549:9,16,19 2550:2,10,21 2551:11
Marcos' ^[1] 2492:15
Mark ^[1] 2416:3
market ^[1] 2443:22
marking ^[1] 2448:22
material ^[4] 2434:18 2458:6,7 2505:14

materials ^[8] 2417:9 2429:17 2432:25 2434:3,8,14,25 2458:14
Matter ^[6] 2414:4,12 2484:16,25 2541:18 2543:16
maximum ^[1] 2477:16
McKeigney ^[20] 2478:19,22 2479:7,10,11,15,21 2480:3,8,17,22 2482:17 2483:1,14 2484:1 2550:11,14,25 2551:4,10
mean ^[19] 2428:14 2432:16 2433:11,20 2435:22 2441:9,10 2447:5 2458:6 2459:25 2465:23 2486:24 2497:24 2498:6 2500:4,16 2523:1 2539:2 2543:3
means ^[3] 2446:15 2484:20 2505:11
measure ^[4] 2437:11,16 2453:7,10
measurement ^[1] 2453:5
measures ^[1] 2482:9
mechanism ^[1] 2482:11
meets ^[1] 2434:21
members ^[6] 2417:23 2423:2 2438:7 2458:19 2486:3 2552:1
memory ^[3] 2430:1 2444:20 2478:1
mention ^[2] 2418:14 2430:4
mentioned ^[6] 2461:20 2474:15 2477:2 2485:16 2527:20 2539:10
merely ^[1] 2449:24
meritorious ^[1] 2418:16
Messrs ^[1] 2480:22
met ^[1] 2482:19
meters ^[4] 2524:2,8 2525:9 2535:2
MICHAEL ^[3] 2416:16 2487:8,15
might ^[25] 2437:15 2477:10 2513:12,15 2521:15 2523:4,7 2525:16 2526:9 2528:10,23 2531:22 2533:1,3,4 2541:25 2544:25 2546:17,20,25 2547:6,11 2548:16,20 2549:1
military ^[10] 2453:18 2454:10,11,19,23,24 2455:8,16 2457:2,13
million ^[27] 2442:6 2447:18,21 2448:6,14 2461:18 2501:20,21 2504:19 2505:2 2506:22 2519:21,21 2520:10,10 2532:19,19 2533:18,18 2547:17,21,22 2548:10,14,25,25 2549:2
millions ^[1] 2505:1
mind ^[10] 2432:8 2481:11 2497:1 2501:10 2512:14 2520:21 2539:19 2543:9,23 2549:5
minimum ^[9] 2501:19 2502:4 2505:5,9,11 2506:24 2507:13 2508:3,5
minute ^[2] 2485:8 2525:25
minutes ^[3] 2538:16,20 2549:19
mischaracterize ^[1] 2483:16
misinterpreted ^[2] 2537:2,11
missile ^[4] 2454:22 2457:4,5,8
missiles ^[2] 2457:7,10
missing ^[1] 2544:15
mix ^[1] 2432:21
MOA ^[2] 2523:6,7
mode ^[1] 2430:10
modify ^[2] 2545:12,22
moment ^[2] 2549:23 2551:15
moments ^[1] 2531:20
Monday ^[1] 2417:7
money ^[14] 2418:21 2449:5,25 2462:7,22 2463:25 2465:14 2474:18 2475:16 2476:20,22

2505:18 2547:8 2548:16
months ^[4] 2430:3 2518:16,16
 2519:3
morning ^[10] 2417:3,4,21 2418:2
 2426:8,9 2427:21,22 2483:7
 2489:6
most ^[3] 2432:17 2445:12 2467:
 10
motion ^[13] 2511:1 2526:4 2530:
 12,24 2531:3,15 2535:24 2536:2,
 2,3,8,18 2537:7
mouthful ^[1] 2451:17
move ^[8] 2429:18 2485:4 2507:7
 2510:2 2514:18 2534:8 2537:4
 2539:5
moved ^[2] 2483:19 2536:12
moves ^[3] 2485:19 2552:2,4
moving ^[2] 2474:12 2508:21
Ms ^[134] 2416:10,13,14,17,19,21
 2419:4,14,20,21 2420:13,17
 2421:8,15,22 2424:20 2426:3,4,
 7,22 2427:15,20 2432:5 2446:8,
 23 2447:3,8 2448:23,25 2454:5
 2455:2,6,13,19 2456:3,13,17
 2457:16 2460:3 2461:11 2462:
 13 2463:13 2468:4,17 2469:14
 2470:3 2472:7 2474:4,5,6 2476:
 9,13 2478:6,18 2479:4 2480:9,
 13 2481:8,10 2484:4,6,15,18
 2485:1,6,15 2486:1,23 2487:13
 2489:11,25 2490:4,6,13,15 2491:
 1,8,9,14 2492:8,13,15 2498:21
 2499:1 2501:15 2502:15 2503:4,
 14 2504:4 2505:19 2508:11
 2510:12,23,25 2515:15 2516:22
 2517:16 2522:13 2523:19 2524:
 9,23 2525:3 2526:25 2527:11,17
 2529:11,16,24 2530:15 2531:11,
 18,19,23 2532:9 2534:2,10 2536:
 3,9 2537:9,10 2538:17 2539:9
 2540:11,15 2549:8,9,16,19,22
 2550:2,10,21 2551:11,15
MTU ^[2] 2548:25 2549:3
MTUs ^[2] 2514:19 2548:18
much ^[15] 2418:18,25 2428:12
 2431:8,13 2433:2 2457:13 2466:
 7 2500:4,4 2509:22 2514:14
 2523:3 2535:18 2550:4
multiples ^[2] 2471:22 2475:14
must ^[8] 2446:13,15 2449:6 2468:
 25 2493:17 2537:25,25,25
Myself ^[3] 2432:20 2499:23 2502:
 24

N

name ^[1] 2532:8
narrowed ^[1] 2542:9
national ^[1] 2439:2
natural ^[1] 2511:15
nature ^[1] 2518:7
nauseam ^[1] 2536:11
necessarily ^[5] 2417:23 2490:10
 2503:12 2527:7 2541:5
necessary ^[6] 2427:3 2441:2
 2500:10 2509:11 2531:9 2551:
 21
need ^[17] 2418:8 2443:25 2447:8
 2456:12 2462:6 2465:2 2470:23
 2493:22 2506:10 2522:12 2530:
 10 2531:19,22 2538:15 2547:6
 2548:11 2551:23
needed ^[2] 2442:15 2448:8
needs ^[11] 2422:24,24 2440:7
 2446:10,11 2465:15 2477:20
 2537:16 2541:15 2543:7,12
negotiate ^[2] 2466:6 2473:18

negotiated ^[7] 2459:6,10,13,16,
 18 2465:22 2473:11
neighborhood ^[2] 2504:25 2506:
 21
networking ^[1] 2439:8
never ^[1] 2444:2
new ^[13] 2437:9,18 2438:4,17,20
 2440:2,25 2460:11 2462:9 2472:
 5 2510:12 2511:21 2512:3
next ^[6] 2420:24 2429:9 2437:22
 2460:17 2488:23 2507:7
Nice ^[1] 2427:23
nominal ^[1] 2461:18
noncontaminated ^[1] 2434:18
none ^[5] 2474:4 2481:6 2540:15
 2549:14,15
nonradiological ^[5] 2465:10,14
 2474:24 2528:1,16
nor ^[2] 2535:15 2536:24
normal ^[1] 2421:1
normally ^[1] 2434:19
note ^[2] 2485:3 2530:7
noted ^[2] 2489:22 2490:1
notes ^[1] 2481:15
Nothing ^[5] 2474:9 2476:5 2512:
 11 2549:9,23
notice ^[4] 2414:13 2447:20 2514:
 9 2526:6
noticed ^[1] 2419:6
notifying ^[1] 2465:1
NRC ^[38] 2429:23,24 2475:3,10,
 25 2476:17 2478:25 2479:10
 2483:21 2486:25 2497:8,11,13
 2498:2,10,12,18 2499:7,9,17
 2500:24 2501:13,19 2502:23
 2503:20,22,24 2504:16,24 2505:
 5,5,15 2506:18,19 2507:8,19
 2532:9 2550:17
NRC's ^[1] 2484:23
NUCLEAR ^[32] 2414:2 2416:1
 2418:15 2427:10 2428:4,5,10
 2429:1,13 2434:4 2436:24 2438:
 10 2443:14 2454:16 2455:8,9
 2458:8 2470:7 2471:15 2482:6
 2499:21 2500:13,25 2503:6,21,
 23 2504:25 2507:9 2508:8,12
 2509:20 2528:10
number ^[5] 2453:9 2456:14 2501:
 10 2534:16 2547:23
numbers ^[11] 2501:2,4 2504:16
 2506:18 2508:4,5 2517:11 2532:
 14,21 2536:22 2537:4
Numeral ^[1] 2519:25

O

O&M ^[2] 2461:20 2477:9
Oak ^[1] 2434:15
oath ^[4] 2423:13,15 2487:6 2550:
 13
object ^[3] 2467:24 2469:23 2502:
 16
objecting ^[1] 2420:16
objection ^[22] 2419:15,20 2420:
 15 2424:20 2454:2 2455:17
 2480:15,16 2484:15,15 2485:4
 2490:4 2492:16 2498:21 2505:
 19 2508:11 2515:15 2516:22
 2522:13 2524:9,23 2534:2
objections ^[3] 2424:19,22 2490:
 3
obligation ^[1] 2440:12
obtain ^[4] 2440:8 2442:15 2443:9
 2446:12
obtained ^[1] 2440:11
obvious ^[1] 2417:25
Obviously ^[4] 2440:23 2460:11

2464:21 2508:22
occasion ^[1] 2462:5
occur ^[9] 2435:20 2436:6 2451:
 22 2452:9 2454:23 2470:20
 2532:22 2536:16,21
occurred ^[6] 2430:23 2435:23
 2471:9 2490:21 2491:16 2513:
 14
occurrences ^[1] 2511:15
occurring ^[4] 2452:23 2454:11
 2517:1 2538:2
occurs ^[2] 2457:13 2471:20
off-site ^[2] 2473:24 2525:11
offer ^[2] 2418:22 2545:12
offered ^[2] 2490:20 2492:4
offhand ^[5] 2499:15 2501:4 2507:
 11 2513:10 2519:18
OFFICE ^[1] 2415:3
officer's ^[1] 2441:11
offset ^[2] 2452:15 2464:3
Okay ^[41] 2428:2 2432:21 2434:2
 2436:3,16 2445:6 2447:3 2464:
 18 2465:24 2474:1 2477:15
 2478:7 2482:2 2488:10 2493:22
 2494:5,13,24 2501:12 2502:2
 2508:2,7 2509:16,25 2511:6
 2513:5 2515:3 2518:23 2519:19
 2522:5 2523:25 2529:11 2530:
 14 2531:1,6 2545:19 2546:6,22,
 22 2549:20,25
old ^[3] 2514:10 2518:16 2519:3
on-site ^[11] 2468:19 2483:18
 2522:20 2523:1 2546:11,25
 2548:15,18,23 2549:1,3
once ^[3] 2471:2 2526:7 2547:24
once-a-year ^[1] 2438:18
one ^[60] 2421:25 2436:23 2438:5,
 21 2440:8 2443:23 2444:2,20
 2446:1,11,12 2447:3,6 2453:8
 2458:21 2463:25 2464:23 2466:
 2,18 2470:25,25 2472:5 2473:20
 2477:18 2479:21 2484:7 2485:8
 2486:9 2488:8,8,10,23 2492:6
 2494:12 2497:21 2498:5,15,15
 2500:1 2505:25 2506:13 2507:1
 2508:5 2509:10 2512:9 2513:6
 2516:9,13 2520:4 2522:21 2525:
 25 2527:3 2529:14 2535:13
 2540:5 2545:22 2547:3 2548:4,
 12 2551:15
one-page ^[1] 2424:1
one-time ^[1] 2435:13
ones ^[2] 2517:10,11
onetime ^[1] 2473:1
only ^[25] 2438:14 2442:17 2448:
 19 2450:3 2462:5 2464:24 2467:
 16 2475:24 2488:7 2498:5,15
 2503:15 2516:20 2518:15 2519:
 3,4 2520:9 2521:10 2522:1 2526:
 9,25 2534:18 2545:2 2547:2,9
open ^[3] 2417:22 2418:1 2497:15
operate ^[4] 2429:14,16 2430:18
 2441:15
operating ^[9] 2430:9 2431:10
 2445:17 2452:13 2454:19,24
 2460:12,15 2476:3
operation ^[5] 2440:22 2445:25
 2446:25 2447:2 2484:14
operations ^[5] 2429:3 2452:1,15
 2458:12 2470:15
opinion ^[1] 2541:19
opportunity ^[4] 2422:5 2455:4
 2536:7 2551:24
opposed ^[6] 2437:1 2444:12
 2466:2 2503:6 2513:7 2543:2

orally ^[1] 2495:3
orange ^[1] 2504:2
oranges ^[1] 2499:24
order ^[21] 2418:11 2419:5,7,9
 2420:7,8,11 2421:2 2422:18
 2472:18 2487:18 2504:23 2509:
 13 2510:14 2521:14 2530:11
 2533:3,4 2538:24 2541:11 2548:
 15
order-of-magnitude ^[2] 2503:
 20,22
ordering ^[1] 2544:15
orders ^[1] 2532:25
orientation ^[1] 2438:12
original ^[1] 2437:20
other ^[32] 2418:13 2422:20 2431:
 1,6 2432:13 2433:13 2454:22
 2459:9 2462:18 2464:24 2465:
 25 2469:25 2477:8 2482:5 2484:
 2 2485:12 2486:2 2494:12,12
 2496:19 2498:6 2505:12 2508:2
 2509:8 2512:11 2516:13 2521:
 21 2528:9 2529:18 2533:4 2534:
 19 2540:2
ought ^[1] 2515:1
out ^[31] 2419:25 2422:11 2429:15
 2433:6 2438:3,20 2449:4 2457:3
 2458:11 2460:5,22 2462:23
 2466:10 2468:10 2470:24 2475:
 25 2476:1 2500:18 2507:3 2509:
 7 2513:19 2514:16 2516:1 2518:
 1,16 2520:12 2538:12 2541:20
 2544:19,24 2545:1
outbound ^[1] 2471:20
outcome ^[3] 2509:15 2513:24
 2540:7
outcomes ^[1] 2523:24
outline ^[1] 2460:16
outlined ^[2] 2429:6 2441:16
outside ^[1] 2470:1
over ^[19] 2421:20 2445:16 2457:7
 2463:22 2475:4,11 2476:17,22
 2477:15,16,24 2496:9 2524:18
 2526:20 2541:14 2542:5 2543:
 12,19 2546:3
overflights ^[1] 2457:2
overpack ^[2] 2461:25 2462:22
overpacks ^[4] 2462:4 2470:25
 2471:5,17
overview ^[1] 2516:25
own ^[3] 2420:22 2439:7 2487:5
ownership ^[1] 2443:17
oxidation ^[3] 2521:2 2522:3,11

P

pad ^[3] 2543:11,12,15
PAGE ^[18] 2416:8 2440:6 2450:
 12 2451:4,4,15 2479:22 2487:25
 2488:10,23 2489:1 2493:15,20
 2494:8,19 2495:17 2505:25
 2508:25
pages ^[2] 2424:1 2474:14
paid ^[10] 2450:8 2452:14 2462:22
 2464:8,11 2468:25 2477:10
 2484:8 2546:11,14
pains ^[1] 2495:21
Panel ^[6] 2414:17,21,25 2423:10
 2478:17 2481:17
paper ^[1] 2438:17
papers ^[2] 2438:15 2439:1
paragraph ^[30] 2450:13 2451:4,
 15 2488:11,16 2489:1 2493:19
 2496:1 2508:25 2510:3,10 2511:
 10,19,23 2526:6 2527:19 2528:1
 2530:9,9 2532:15,16 2533:14
 2534:25 2536:13,13,23 2544:14,

<p>17 2545:16 2546:7 parameters ^[1] 2431:11 pardon ^[1] 2530:16 PARKYN ^[44] 2416:9 2421:23 2423:11,17,23,24 2424:17,22 2425:1 2427:21 2440:5 2442:10 2446:10 2447:10 2449:9 2455:2, 6,20 2456:15,18,20 2457:17 2460:23 2467:20 2469:14,20 2470:4 2472:9,20,24 2474:14 2476:14 2483:7 2489:6 2495:2, 13,19 2496:4 2502:17 2539:10, 12 2545:25 2547:3 2550:4 Parkyn's ^[5] 2421:23 2468:2,10 2496:6 2539:23 parsed ^[1] 2520:11 part ^[33] 2432:3 2433:16 2450:18 2463:4 2465:3 2471:25 2475:19 2477:5,8 2484:11 2485:1 2498: 16 2499:15,20 2502:18,20,25 2503:1,7,8,17 2504:22 2505:5, 22,23,24 2506:1 2507:3 2519:24 2532:14 2534:22 2540:20 2543: 3 particular ^[10] 2419:14 2478:17 2494:21 2497:21 2498:1 2516: 24 2533:22 2535:2,11 2536:17 particulars ^[1] 2500:20 parties ^[8] 2418:12 2419:2,13 2423:3 2455:25 2484:3 2486:3 2549:7 parties' ^[1] 2456:2 parts ^[1] 2520:14 party ^[2] 2453:22 2454:14 pass ^[1] 2479:23 pass-through ^[6] 2459:19,22 2460:21 2461:1 2462:16 2482: 12 passage ^[2] 2546:1,3 passed ^[7] 2451:6 2460:1,6 2461: 21 2471:10,11 2495:23 passing ^[1] 2460:13 patented ^[2] 2443:19,20 patterns ^[1] 2475:9 PAUL ^[1] 2414:15 Pause ^[3] 2444:23 2463:12 2470: 2 pay ^[10] 2433:19 2450:14 2451: 21 2452:5,7,12 2464:19 2469:1 2482:13 2495:24 paying ^[4] 2436:21 2437:7 2454: 7 2464:20 payment ^[8] 2466:13,14,22,24 2473:19 2477:5,10,17 payments ^[6] 2450:1,9 2466:5, 20 2484:11,13 pays ^[3] 2449:4 2472:2,4 peculiar ^[1] 2498:1 pending ^[5] 2417:17 2443:10 2444:15 2509:15 2535:25 people ^[2] 2437:7 2492:2 per ^[6] 2429:13 2435:9 2463:23 2473:6 2477:21 2487:17 percent ^[24] 2445:12,13,14,18,22 2462:5 2463:22,23 2464:3,20,24 2469:1 2474:17,19 2476:16,19 2478:4 2519:9,11,14 2526:11 2535:10,12 2537:20 percentage ^[1] 2475:13 perfectly ^[2] 2486:16 2503:24 perform ^[1] 2475:6 performed ^[4] 2430:24 2432:9, 13 2436:23 perhaps ^[4] 2420:24 2455:23 2530:23 2542:17</p>	<p>period ^[21] 2457:21 2466:24 2467:2,4,12,15,21 2468:18 2469: 5,10 2471:6 2475:11 2476:21,22 2477:12,15,16,24 2542:24 2543: 19 2547:2 permission ^[1] 2475:24 person ^[3] 2433:8 2436:12 2452: 9 personal ^[1] 2539:3 personnel ^[1] 2433:23 persons ^[1] 2439:1 PETER ^[1] 2414:23 petroleum ^[1] 2522:12 PFS ^[102] 2419:6 2422:11,13 2426:12,14 2431:18 2433:1 2434:23 2438:7,9 2439:13,16,19, 22 2440:1,7,11,13,19,19 2442:15, 18,24,25 2443:3,8,13,18 2444:3, 24 2445:11 2446:9,19 2447:12 2449:6,6,7 2450:14,23 2451:16, 18,19 2452:18,21 2453:10,20,25 2454:1,8,18 2458:12,15,15,19 2459:20 2461:1,2,6 2462:16 2465:9,21 2467:22 2468:12 2469:7 2470:20 2471:18,25 2472:2,19 2475:15,22 2477:8 2484:14 2486:15 2493:17 2495: 17,25 2496:7,13,25 2522:6 2524: 14 2526:2,7 2528:7 2532:17,24 2533:22 2535:3,12 2536:17,21, 23,24 2537:3,17,25 2538:2 2539: 12 2540:3 2546:11 2550:22 PFS's ^[12] 2419:8,10 2422:6 2439:12 2442:21 2443:22 2444: 19 2445:3 2449:18 2451:25 2452:20 2463:4 PFSF ^[2] 2423:25 2451:17 Ph.D ^[1] 2487:16 phase ^[1] 2541:13 physical ^[2] 2519:12 2524:13 physicists ^[1] 2438:14 physics ^[1] 2438:12 piece ^[2] 2549:16,17 pilot ^[1] 2457:5 pipng ^[2] 2500:9,14 place ^[17] 2429:8 2430:13 2433:2 2435:19 2436:7 2446:2,24 2449: 25 2450:3 2455:16 2461:15 2466:7 2488:7 2497:15 2522:11 2545:7,19 placed ^[2] 2477:7 2479:6 places ^[3] 2435:12 2488:1,5 plain ^[1] 2537:23 plan ^[25] 2429:4,6,22,25 2437:25 2446:13,15 2474:16 2475:15,25 2476:23 2478:1,2 2527:1,5,6,6,9, 10,12 2529:7 2539:24 2542:12, 15 2546:9 plane ^[3] 2523:4,15,23 planned ^[1] 2527:14 planning ^[1] 2448:22 plans ^[3] 2420:23 2454:1 2539: 25 Plant ^[10] 2428:5 2429:1 2431:10, 15 2433:3 2475:1,5 2476:3 2501: 7 2503:6 plants ^[4] 2499:21 2503:21,23 2507:9 please ^[9] 2423:12 2472:18 2478: 19 2479:9 2485:9 2493:3 2512:1 2527:18 2551:16 plus ^[4] 2457:22 2468:6 2502:1 2535:1 point ^[42] 2419:1 2422:2,15,25 2424:16,24 2429:12 2439:9</p>	<p>2441:1,3 2443:20 2447:15 2453: 2 2459:11,17 2468:1 2474:10 2478:16 2481:1 2485:3 2486:4, 23 2489:11 2492:17 2494:14 2497:8,11,12 2502:13,21 2504:8 2511:3,17 2514:13 2521:24 2531:3 2535:17 2544:25 2545:2 2547:9 2549:10 2552:5 pointed ^[1] 2470:24 pointing ^[1] 2509:7 points ^[3] 2417:16 2419:25 2438: 21 policy ^[12] 2449:1,2 2455:9,9,20, 22 2456:1 2470:8,10 2525:11,14, 16 pool ^[5] 2429:11 2430:12 2431:2, 4 2523:17 pools ^[1] 2500:13 portion ^[1] 2501:13 position ^[1] 2449:14 possess ^[3] 2429:14,16 2430:18 possibility ^[10] 2523:13 2527:20 2528:9,12,13 2535:16 2538:2 2542:20 2546:13 2547:6 possible ^[6] 2472:1 2513:18 2522:20 2529:2 2530:23 2541: 21 Possibly ^[1] 2431:23 potential ^[5] 2449:20 2511:8 2516:25 2541:19 2544:12 Power ^[17] 2428:5 2429:1,3 2433: 3 2476:3 2499:21 2500:25 2502: 7 2503:6,21,23 2504:17,25 2507: 9,21 2508:8,12 precedent ^[1] 2420:19 preceding ^[1] 2437:7 precise ^[1] 2431:17 Precisely ^[1] 2472:6 prefer ^[1] 2456:3 preference ^[1] 2421:10 prefile ^[1] 2492:4 prefiled ^[7] 2474:15 2481:18 2485:1 2487:15 2489:7 2490:22, 23 preliminary ^[1] 2429:6 premature ^[1] 2488:13 premise ^[2] 2436:18 2437:24 prepare ^[2] 2429:4 2444:5 prepared ^[8] 2424:2 2432:17 2481:13,18 2487:20 2490:16 2505:23 2538:16 prepayment ^[3] 2484:20,21,23 presence ^[1] 2528:19 present ^[3] 2446:14,15 2536:23 presentation ^[3] 2418:11 2419:5 2441:12 presented ^[3] 2438:16 2519:23 2538:7 presenting ^[1] 2417:15 presents ^[1] 2439:7 press ^[1] 2457:9 pressurized ^[1] 2501:20 presumably ^[5] 2450:10 2460: 17 2478:5 2514:25 2519:2 presume ^[1] 2476:19 presumption ^[1] 2468:24 pretty ^[2] 2438:5,18 previous ^[3] 2437:1 2467:7 2501: 9 previously ^[9] 2422:15 2423:19 2455:24 2461:20 2466:6 2473: 24 2487:5,10 2550:18 price ^[4] 2437:1 2439:14,24 2495: 19 pricing ^[4] 2459:13 2473:9,14,15</p>	<p>principal ^[1] 2454:16 printed ^[1] 2438:16 prior ^[7] 2466:2,23 2468:22 2477: 4 2484:14 2486:15 2505:24 Private ^[5] 2417:5,17 2441:14 2507:15 2508:22 probabilistic ^[1] 2544:2 probabilities ^[1] 2493:9 probability ^[7] 2509:4,5,17 2536: 15 2544:19,22 2545:3 Probably ^[9] 2449:19 2458:13 2470:18 2491:15 2500:14 2501: 1 2511:14 2533:13 2544:22 problem ^[5] 2421:17,21 2494:18 2504:11 2550:8 procedural ^[1] 2490:17 procedure ^[1] 2436:14 proceed ^[2] 2420:22 2486:8 proceeding ^[7] 2417:6,10,16 2480:6 2481:2 2490:22 2534:22 proceeds ^[1] 2454:13 process ^[9] 2429:25 2437:20 2456:25 2500:5 2542:21,25 2543:7,15,16 produced ^[1] 2462:20 production ^[1] 2429:3 professional ^[3] 2438:8 2479:14 2480:18 program ^[1] 2542:5 progressively ^[1] 2471:8 prohibits ^[1] 2503:1 project ^[1] 2442:15 projected ^[1] 2534:25 propane ^[1] 2523:1 propellants ^[1] 2523:2 propellent ^[1] 2522:21 property ^[13] 2453:13 2454:16, 16 2457:14 2470:7 2503:22 2504:1 2507:8,21,25 2508:8 2515:9 2541:25 proportionate ^[2] 2450:14 2459: 20 proposal ^[1] 2417:16 propose ^[1] 2429:7 proposed ^[3] 2442:2 2447:11 2550:22 proposition ^[2] 2462:14 2515:25 protect ^[5] 2513:24 2514:3,8,20 2515:7 protecting ^[1] 2514:1 protection ^[1] 2513:13 provide ^[6] 2481:24 2482:15 2506:7 2513:13 2539:18,19 provided ^[5] 2482:18,23 2532:14 2536:19,22 providing ^[2] 2446:16,19 provision ^[1] 2482:10 provisions ^[2] 2482:20 2497:20 public ^[4] 2417:23 2423:2 2481: 22 2514:20 purpose ^[13] 2443:17 2475:22 2486:13 2492:1 2513:16 2515: 24 2516:4 2517:23 2532:13 2539:4 2543:18 2544:13 2546: 13 purposes ^[1] 2545:3 pursuant ^[2] 2414:13 2502:12 put ^[14] 2437:19 2441:2 2455:24 2462:8 2464:25 2483:18 2486: 11 2491:24 2517:17 2527:8 2535:7 2537:14 2538:13 2551: 24 puts ^[1] 2549:22 putting ^[3] 2459:3 2531:16 2544: 17</p>
--	---	--	--

<p>PWR ^[1] 2502:9</p> <p>Q</p> <p>qualifications ^[4] 2479:14 2480:18 2493:8 2536:15</p> <p>quarter ^[1] 2552:6</p> <p>Question ^[79] 2428:2 2432:4 2440:6 2446:5,6 2450:12 2454:5 2455:12 2456:6,11,12,14,16,21 2457:1 2458:25 2460:1 2465:20 2467:7 2468:14,16 2469:4,13,21,24 2472:24 2473:15,20 2476:9,16 2483:22 2484:16,19,19 2492:6 2495:15,16 2496:1,4,10,10 2498:10 2499:12 2500:6 2501:9 2504:7,15,22 2505:22 2506:3,8,13,16 2507:7 2508:15 2512:2,10,16,18,20,25 2518:9 2523:19,21 2524:16,24 2525:2,6 2526:9 2527:9 2529:18 2534:8,15 2537:13 2542:8 2543:25 2544:1,9 2545:16</p> <p>questioning ^[3] 2502:16 2535:21,22</p> <p>questions ^[56] 2418:12 2421:19 2422:14 2427:16 2436:3 2447:9 2456:14 2461:14 2463:13 2467:24,25 2472:7,23 2474:2,12,13 2478:12 2483:6 2484:3,3 2485:7,10,12 2486:2 2491:1 2495:12 2503:7 2516:16 2517:25 2518:5 2526:25 2527:3,4,5,7 2529:25 2530:11,23 2531:2,9,15 2532:10 2536:1,11 2537:22,23 2538:7,11 2540:12,17 2549:7,7 2551:11,17,19 2552:1</p> <p>quickly ^[1] 2534:9</p> <p>Quintana ^[2] 2415:19 2531:24</p> <p>quite ^[7] 2456:18 2469:4 2471:6 2500:21 2504:21 2524:16 2537:23</p> <p>quote ^[3] 2440:7,9 2509:4</p> <p>R</p> <p>radically ^[1] 2527:9</p> <p>radioactive ^[12] 2431:13 2432:25 2434:3,13,20,25 2458:7 2518:11 2529:1 2541:1,5 2543:11</p> <p>radioactivities ^[1] 2541:14</p> <p>radioactivity ^[19] 2437:17 2500:2,7,9,15,18 2524:18 2528:14,17,24 2529:5 2541:9 2543:1,5,8,14,17,22,23</p> <p>radiological ^[7] 2465:8,11,17 2474:24 2493:10 2529:8,9</p> <p>radionuclide ^[2] 2493:16 2508:23</p> <p>rail ^[2] 2520:24 2522:12</p> <p>railcar ^[1] 2443:16</p> <p>Railroads ^[1] 2443:14</p> <p>raise ^[2] 2461:17 2471:9</p> <p>raised ^[1] 2538:8</p> <p>ramping ^[1] 2430:5</p> <p>range ^[21] 2426:18 2445:12,16 2454:20 2482:7 2519:23 2520:1,6,15,17,18 2521:5,7,9,11,12,19,20 2525:18 2532:18 2535:4</p> <p>ranged ^[2] 2519:21 2520:10</p> <p>rate ^[6] 2436:19,20 2474:17,19 2476:16 2477:23</p> <p>rates ^[3] 2433:4 2437:6 2476:25</p> <p>rather ^[3] 2420:9 2431:10 2471:22</p> <p>reach ^[2] 2458:11 2471:3</p> <p>reactor ^[18] 2429:10,11,16 2430:12 2467:1 2482:5 2500:13 2501:17,20,21 2502:6,11 2504:17,25 2507:14 2508:4,13 2518:17</p> <p>reactors ^[6] 2498:17,19 2500:25 2507:22 2508:9 2516:19</p> <p>read ^[10] 2424:17,24 2456:13,16 2464:4 2480:20 2489:23 2490:2 2492:16 2540:19</p> <p>readily ^[1] 2438:5</p> <p>reading ^[1] 2532:15</p> <p>ready ^[4] 2478:16 2481:2 2486:7 2487:3</p> <p>real ^[3] 2474:17,19 2476:16</p> <p>really ^[4] 2440:17 2459:16 2542:9 2543:16</p> <p>reask ^[1] 2456:12</p> <p>reason ^[11] 2420:4,6 2494:21 2499:16 2516:23 2517:3 2521:17 2537:20 2543:4 2548:12,13</p> <p>reasonable ^[7] 2446:18 2455:21 2482:7,15 2502:5 2509:12 2539:19</p> <p>reasonably ^[1] 2507:24</p> <p>reasons ^[3] 2482:3 2535:7 2537:12</p> <p>rebuttal ^[13] 2418:5,9 2421:13,16 2456:11 2517:18 2530:4 2531:17,21 2549:11,21 2550:1,20</p> <p>recall ^[7] 2430:19 2474:11 2505:20,21 2545:21,25 2546:4</p> <p>recalled ^[3] 2478:15 2486:6 2551:21</p> <p>receipt ^[2] 2452:24 2466:25</p> <p>receive ^[2] 2429:13 2430:17</p> <p>received ^[1] 2417:8</p> <p>receiving ^[1] 2418:15</p> <p>Recently ^[2] 2434:9 2457:9</p> <p>recess ^[2] 2472:16 2538:22</p> <p>recognize ^[3] 2421:18 2479:5 2527:8</p> <p>recognized ^[1] 2422:3</p> <p>Recognizing ^[2] 2492:15 2499:11</p> <p>recollect ^[1] 2520:1</p> <p>recollection ^[2] 2501:17 2518:10</p> <p>record ^[34] 2418:4 2422:16 2424:24 2425:2 2426:21 2448:21 2452:8 2472:18 2473:8,17 2480:10,19,24 2484:21 2485:2,4 2486:11,17 2489:23 2490:25 2491:10,16 2492:17,20 2498:8 2503:12 2504:9 2508:12 2537:1,11,22,24 2538:25 2539:4</p> <p>records ^[3] 2433:10 2444:25 2445:1</p> <p>recoups ^[1] 2454:15</p> <p>recover ^[1] 2520:23</p> <p>recovery ^[1] 2470:6</p> <p>recross ^[2] 2474:3 2540:13</p> <p>RECROSS-EXAMINATION ^[3] 2476:12 2493:4 2527:16</p> <p>redefine ^[1] 2470:23</p> <p>Redirect ^[21] 2416:11,14 2456:4 2472:10,15,19,21 2481:10 2485:14 2487:12 2504:12 2529:15,17,25 2530:16 2531:12 2535:25 2536:4 2538:16 2539:7,8</p> <p>redraft ^[1] 2492:1</p> <p>reduce ^[1] 2518:23</p> <p>reduced ^[2] 2463:25 2539:20</p> <p>reduction ^[3] 2430:5,7,8</p> <p>reestablish ^[2] 2547:7 2548:21</p> <p>refer ^[2] 2493:16 2527:19</p> <p>reference ^[4] 2433:13 2465:24 2511:19 2526:10</p> <p>references ^[1] 2513:16</p> <p>referring ^[8] 2433:23 2484:25 2496:15 2526:14,15 2527:25 2528:16,18</p> <p>reflect ^[2] 2431:9 2460:11</p> <p>reflected ^[2] 2461:7,19</p> <p>refresh ^[1] 2501:16</p> <p>reg ^[1] 2506:10</p> <p>regard ^[1] 2510:25</p> <p>regarding ^[5] 2417:9 2428:4 2455:25 2487:16 2545:16</p> <p>regardless ^[2] 2472:3,4</p> <p>regs ^[1] 2501:13</p> <p>regularly ^[1] 2430:24</p> <p>regularity ^[9] 2481:22 2482:24 2497:8,12,13 2498:11 2507:13 2540:20,20</p> <p>regulations ^[16] 2476:17 2482:16,21 2484:22 2498:24 2499:7,10,21,22 2502:18,19 2503:3 2506:1,6,19 2550:23</p> <p>regulatorily ^[1] 2505:15</p> <p>REGULATORY ^[11] 2414:2 2416:1 2418:15 2427:6 2429:13 2436:24 2458:9 2471:15 2496:5 2497:17 2539:14</p> <p>rehabilitate ^[2] 2422:6,10</p> <p>reiterate ^[1] 2469:20</p> <p>reject ^[1] 2537:18</p> <p>rejected ^[1] 2484:17</p> <p>relate ^[2] 2517:13 2531:15</p> <p>related ^[3] 2468:1 2486:12 2511:8</p> <p>relates ^[5] 2446:6 2468:2,4 2469:25 2498:17</p> <p>relationship ^[1] 2423:3</p> <p>relative ^[3] 2437:7 2515:4,5</p> <p>relatively ^[1] 2433:1</p> <p>release ^[21] 2432:1,2 2458:9 2497:24 2508:24 2509:6,22 2518:11 2519:10,11 2528:14,24 2529:1 2530:22 2535:10,13 2536:15,17 2541:1,5 2542:25</p> <p>released ^[2] 2432:2 2541:13</p> <p>releases ^[1] 2493:17</p> <p>relevance ^[2] 2514:1 2526:5</p> <p>relevancy ^[1] 2517:9</p> <p>relevant ^[9] 2502:25 2503:1 2517:15 2524:17,22 2536:20,21 2537:24 2543:9</p> <p>relies ^[2] 2522:23 2551:6</p> <p>rely ^[1] 2491:11</p> <p>relying ^[2] 2455:20 2522:7</p> <p>remain ^[7] 2423:15 2466:8 2473:21 2487:6 2488:9 2530:10 2550:13</p> <p>remained ^[1] 2473:3</p> <p>remains ^[3] 2423:13 2442:18,25</p> <p>Remember ^[19] 2429:5 2447:8 2449:10,24 2462:3 2463:24 2466:17 2470:24 2477:2,19 2501:3,10 2507:11 2518:12,14,18 2519:6 2520:2,5</p> <p>removal ^[5] 2429:9,19 2430:11 2431:12 2458:6</p> <p>remove ^[1] 2500:7</p> <p>removed ^[1] 2486:14</p> <p>removing ^[2] 2500:2,8</p> <p>rendered ^[1] 2495:19</p> <p>renegotiated ^[1] 2467:14</p> <p>renew ^[2] 2526:3 2536:18</p> <p>renewal ^[1] 2468:6</p> <p>repay ^[1] 2449:6</p> <p>rephrase ^[1] 2454:5</p> <p>replace ^[2] 2443:1 2546:12</p> <p>replaced ^[1] 2464:5</p> <p>replaces ^[1] 2548:9</p> <p>replicate ^[1] 2437:20</p> <p>report ^[1] 2475:7</p> <p>reporter ^[3] 2424:15 2480:12 2492:7</p> <p>reporting ^[1] 2445:4</p> <p>reports ^[3] 2511:18 2514:5 2526:21</p> <p>request ^[4] 2419:9 2429:13 2490:1 2538:25</p> <p>require ^[6] 2434:21 2450:14 2460:7 2463:10 2505:16 2540:21</p> <p>required ^[22] 2435:20 2451:20 2452:12 2453:14 2458:8 2462:15,18 2475:20 2482:15,20 2483:24 2484:13,22 2502:5 2504:24 2506:18 2507:2,21 2508:8,17 2509:12 2551:7</p> <p>requirement ^[5] 2450:18 2462:20 2471:25 2482:13 2507:19</p> <p>requirements ^[3] 2427:7 2434:21 2445:4</p> <p>requires ^[5] 2500:24 2501:19 2503:20,22 2507:8</p> <p>research ^[1] 2439:7</p> <p>reserve ^[1] 2421:1</p> <p>residual ^[3] 2437:16 2543:21,22</p> <p>resolve ^[2] 2496:25 2540:9</p> <p>resolved ^[2] 2484:16 2542:17</p> <p>respect ^[53] 2417:20 2418:10 2420:17 2421:3 2422:18,20 2434:23 2435:18,19 2452:18 2457:16 2463:20 2467:19 2469:25 2470:3 2471:17 2473:9,22 2493:7 2494:1,3 2496:3,5,14,21,23 2497:2,7 2498:14 2499:3,18,21,22 2500:19 2502:18,20 2503:17 2507:1 2511:18 2513:23 2518:10 2519:19 2522:7 2528:6 2531:17 2532:24 2533:15 2534:15,24 2535:10 2538:8 2539:11 2551:23</p> <p>respond ^[4] 2421:8 2422:9 2435:15 2441:4</p> <p>response ^[18] 2421:24,25 2428:2 2432:4 2436:3 2440:5,14 2449:22 2450:12 2465:20 2469:20 2490:14 2506:23 2510:19 2512:11 2534:17 2537:21 2543:24</p> <p>responses ^[5] 2511:20,21,22,24 2512:7</p> <p>responsibilities ^[1] 2473:23</p> <p>responsibility ^[3] 2460:19 2467:8 2483:18</p> <p>responsible ^[1] 2453:21</p> <p>rest ^[1] 2511:23</p> <p>restrict ^[1] 2426:18</p> <p>restricted ^[1] 2542:11</p> <p>restrictions ^[3] 2457:5,6 2476:2</p> <p>result ^[4] 2420:23 2457:1 2477:11 2486:9</p> <p>resume ^[3] 2424:9,12,23</p> <p>retake ^[1] 2423:12</p> <p>retired ^[1] 2450:5</p> <p>return ^[3] 2474:17,19 2476:16</p> <p>reuse ^[2] 2471:18,22</p> <p>reused ^[1] 2472:1</p> <p>revenue ^[1] 2452:15</p> <p>review ^[13] 2427:1 2436:7,12,15 2450:11 2461:4,6,9,10,16,23 2539:12,13</p> <p>reviewed ^[2] 2441:13 2546:16</p> <p>reviewing ^[1] 2440:19</p>	<p>17,20,21 2502:6,11 2504:17,25 2507:14 2508:4,13 2518:17</p> <p>reactors ^[6] 2498:17,19 2500:25 2507:22 2508:9 2516:19</p> <p>read ^[10] 2424:17,24 2456:13,16 2464:4 2480:20 2489:23 2490:2 2492:16 2540:19</p> <p>readily ^[1] 2438:5</p> <p>reading ^[1] 2532:15</p> <p>ready ^[4] 2478:16 2481:2 2486:7 2487:3</p> <p>real ^[3] 2474:17,19 2476:16</p> <p>really ^[4] 2440:17 2459:16 2542:9 2543:16</p> <p>reask ^[1] 2456:12</p> <p>reason ^[11] 2420:4,6 2494:21 2499:16 2516:23 2517:3 2521:17 2537:20 2543:4 2548:12,13</p> <p>reasonable ^[7] 2446:18 2455:21 2482:7,15 2502:5 2509:12 2539:19</p> <p>reasonably ^[1] 2507:24</p> <p>reasons ^[3] 2482:3 2535:7 2537:12</p> <p>rebuttal ^[13] 2418:5,9 2421:13,16 2456:11 2517:18 2530:4 2531:17,21 2549:11,21 2550:1,20</p> <p>recall ^[7] 2430:19 2474:11 2505:20,21 2545:21,25 2546:4</p> <p>recalled ^[3] 2478:15 2486:6 2551:21</p> <p>receipt ^[2] 2452:24 2466:25</p> <p>receive ^[2] 2429:13 2430:17</p> <p>received ^[1] 2417:8</p> <p>receiving ^[1] 2418:15</p> <p>Recently ^[2] 2434:9 2457:9</p> <p>recess ^[2] 2472:16 2538:22</p> <p>recognize ^[3] 2421:18 2479:5 2527:8</p> <p>recognized ^[1] 2422:3</p> <p>Recognizing ^[2] 2492:15 2499:11</p> <p>recollect ^[1] 2520:1</p> <p>recollection ^[2] 2501:17 2518:10</p> <p>record ^[34] 2418:4 2422:16 2424:24 2425:2 2426:21 2448:21 2452:8 2472:18 2473:8,17 2480:10,19,24 2484:21 2485:2,4 2486:11,17 2489:23 2490:25 2491:10,16 2492:17,20 2498:8 2503:12 2504:9 2508:12 2537:1,11,22,24 2538:25 2539:4</p> <p>records ^[3] 2433:10 2444:25 2445:1</p> <p>recoups ^[1] 2454:15</p> <p>recover ^[1] 2520:23</p> <p>recovery ^[1] 2470:6</p> <p>recross ^[2] 2474:3 2540:13</p> <p>RECROSS-EXAMINATION ^[3] 2476:12 2493:4 2527:16</p> <p>redefine ^[1] 2470:23</p> <p>Redirect ^[21] 2416:11,14 2456:4 2472:10,15,19,21 2481:10 2485:14 2487:12 2504:12 2529:15,17,25 2530:16 2531:12 2535:25 2536:4 2538:16 2539:7,8</p> <p>redraft ^[1] 2492:1</p> <p>reduce ^[1] 2518:23</p> <p>reduced ^[2] 2463:25 2539:20</p> <p>reduction ^[3] 2430:5,7,8</p> <p>reestablish ^[2] 2547:7 2548:21</p> <p>refer ^[2] 2493:16 2527:19</p> <p>reference ^[4] 2433:13 2465:24 2511:19 2526:10</p>	<p>references ^[1] 2513:16</p> <p>referring ^[8] 2433:23 2484:25 2496:15 2526:14,15 2527:25 2528:16,18</p> <p>reflect ^[2] 2431:9 2460:11</p> <p>reflected ^[2] 2461:7,19</p> <p>refresh ^[1] 2501:16</p> <p>reg ^[1] 2506:10</p> <p>regard ^[1] 2510:25</p> <p>regarding ^[5] 2417:9 2428:4 2455:25 2487:16 2545:16</p> <p>regardless ^[2] 2472:3,4</p> <p>regs ^[1] 2501:13</p> <p>regularly ^[1] 2430:24</p> <p>regularity ^[9] 2481:22 2482:24 2497:8,12,13 2498:11 2507:13 2540:20,20</p> <p>regulations ^[16] 2476:17 2482:16,21 2484:22 2498:24 2499:7,10,21,22 2502:18,19 2503:3 2506:1,6,19 2550:23</p> <p>regulatorily ^[1] 2505:15</p> <p>REGULATORY ^[11] 2414:2 2416:1 2418:15 2427:6 2429:13 2436:24 2458:9 2471:15 2496:5 2497:17 2539:14</p> <p>rehabilitate ^[2] 2422:6,10</p> <p>reiterate ^[1] 2469:20</p> <p>reject ^[1] 2537:18</p> <p>rejected ^[1] 2484:17</p> <p>relate ^[2] 2517:13 2531:15</p> <p>related ^[3] 2468:1 2486:12 2511:8</p> <p>relates ^[5] 2446:6 2468:2,4 2469:25 2498:17</p> <p>relationship ^[1] 2423:3</p> <p>relative ^[3] 2437:7 2515:4,5</p> <p>relatively ^[1] 2433:1</p> <p>release ^[21] 2432:1,2 2458:9 2497:24 2508:24 2509:6,22 2518:11 2519:10,11 2528:14,24 2529:1 2530:22 2535:10,13 2536:15,17 2541:1,5 2542:25</p> <p>released ^[2] 2432:2 2541:13</p> <p>releases ^[1] 2493:17</p> <p>relevance ^[2] 2514:1 2526:5</p> <p>relevancy ^[1] 2517:9</p> <p>relevant ^[9] 2502:25 2503:1 2517:15 2524:17,22 2536:20,21 2537:24 2543:9</p> <p>relies ^[2] 2522:23 2551:6</p> <p>rely ^[1] 2491:11</p> <p>relying ^[2] 2455:20 2522:7</p> <p>remain ^[7] 2423:15 2466:8 2473:21 2487:6 2488:9 2530:10 2550:13</p> <p>remained ^[1] 2473:3</p> <p>remains ^[3] 2423:13 2442:18,25</p> <p>Remember ^[19] 2429:5 2447:8 2449:10,24 2462:3 2463:24 2466:17 2470:24 2477:2,19 2501:3,10 2507:11 2518:12,14,18 2519:6 2520:2,5</p> <p>removal ^[5] 2429:9,19 2430:11 2431:12 2458:6</p> <p>remove ^[1] 2500:7</p> <p>removed ^[1] 2486:14</p> <p>removing ^[2] 2500:2,8</p> <p>rendered ^[1] 2495:19</p> <p>renegotiated ^[1] 2467:14</p> <p>renew ^[2] 2526:3 2536:18</p> <p>renewal ^[1] 2468:6</p> <p>repay ^[1] 2449:6</p> <p>rephrase ^[1] 2454:5</p> <p>replace ^[2] 2443:1 2546:12</p>	<p>replaced ^[1] 2464:5</p> <p>replaces ^[1] 2548:9</p> <p>replicate ^[1] 2437:20</p> <p>report ^[1] 2475:7</p> <p>reporter ^[3] 2424:15 2480:12 2492:7</p> <p>reporting ^[1] 2445:4</p> <p>reports ^[3] 2511:18 2514:5 2526:21</p> <p>request </p>
---	--	---	---

<p>reviews [1] 2436:5 revise [1] 2491:4 revised [3] 2480:6 2487:17 2490:17 Ridge [1] 2434:15 risk [6] 2456:1 2508:23 2509:14 2510:16 2516:3 2544:2 risks [2] 2493:16 2510:5 River [6] 2441:24 2447:4,12,16, 25 2449:10 road [1] 2439:3 Robert [4] 2478:19,24 2479:11 2550:16 rods [1] 2513:8 role [1] 2475:16 rolled [1] 2495:22 Roman [1] 2519:24 Room [1] 2414:9 rough [1] 2505:2 roughly [1] 2466:22 routinely [1] 2433:15 rule [1] 2505:5 rules [2] 2507:4 2508:17 ruling [1] 2422:21 run [2] 2457:24 2458:3 running [1] 2421:21 runs [1] 2489:10 ruptures [1] 2497:23 rural [3] 2520:24 2521:21,22</p> <p style="text-align: center;">S</p> <p>S-a-n-d-q-u-i-s-t [2] 2489:4,13 sabotage [2] 2513:22 2519:12 safe [3] 2430:25 2499:24 2516:2 Safety [5] 2414:17,21,25 2481:23 2514:20 Salt [4] 2414:10 2415:7 2427:23 2525:21 same [21] 2420:10 2436:6 2450:22 2451:13 2452:17 2464:21,22 2466:21 2468:22 2476:1 2477:22 2485:24 2486:1 2496:17,22 2500:2,7 2514:14 2533:14 2534:24 2535:9 samples [1] 2438:22 Sandia [2] 2489:3 2519:13 Sandquist [14] 2489:4,12 2512:24 2513:1 2519:23,25 2521:18 2522:2,15,23 2524:1,3 2533:17 2534:25 Sandquist's [2] 2519:20 2525:18 satisfy [1] 2469:22 Saturday [2] 2417:14,24 saying [17] 2433:18 2493:22 2494:16 2510:9 2514:24 2515:2 2528:6,19 2532:21 2539:25 2540:3,4 2541:2,7,18 2542:14 2546:4 says [9] 2488:1,12,20,21,24 2489:2 2497:13 2507:13,17 scanned [1] 2434:16 scattered [2] 2524:17,18 scenario [3] 2520:2 2548:5 2549:4 schedule [1] 2484:23 Schmidt [1] 2519:4 scope [6] 2455:1,17,25 2456:9 2470:1 2497:19 second [30] 2422:1 2464:10,11, 12,14,16,17 2466:15,16,20,22 2488:2,8,10,11,15,19,20,24 2489:1,3 2510:3,9 2511:19 2521:1 2530:9 2532:15 2536:13 2538:5 2544:14 secondly [1] 2494:2</p>	<p>seconds [1] 2552:8 section [1] 2506:24 secure [2] 2427:10 2551:8 security [2] 2431:8,9 see [19] 2423:1 2427:23 2467:24 2468:2,14 2475:7 2488:25 2491:25 2496:9 2499:20 2505:14 2520:22 2526:10,20 2529:20 2531:21 2536:25 2548:7 2552:8 seemed [2] 2494:14 2522:1 Seems [13] 2419:17 2494:16 2498:1 2500:16 2505:8 2506:25 2509:10 2521:14 2522:17,22 2524:18 2540:9 2548:4 seen [4] 2457:3 2501:1 2507:10 2525:14 sees [1] 2537:19 selected [3] 2459:12 2517:9 2521:10 sending [1] 2462:25 senior [1] 2441:11 sense [11] 2452:13 2459:15 2460:10 2466:10 2474:23 2477:5 2504:16 2515:5 2541:4 2545:6 2548:20 sent [1] 2460:5 sentence [2] 2450:13 2488:24 separate [2] 2434:18 2464:25 sequencing [1] 2544:16 serious [1] 2546:25 serve [1] 2491:25 serves [1] 2537:2 service [43] 2418:16 2450:19,22 2451:3,9,22 2452:4,11,17 2457:17,18,19,20,24,25 2458:10,13,16, 23 2459:14 2462:1,24 2463:17 2467:3,4,10,13,17 2468:7,9 2469:6,10,18,19 2471:12 2473:10,11,16,20 2478:14 2484:11 2550:7 2551:20 session [3] 2417:22 2418:1,7 set [3] 2424:8 2455:14 2521:5 sets [2] 2503:2 2507:18 seventy-five [1] 2502:1 several [4] 2420:25 2475:13 2491:14 2505:1 severe [1] 2519:2 Sevier [1] 2454:19 SFNS [1] 2528:8 shall [1] 2424:23 share [2] 2450:15 2459:21 she's [3] 2420:16 2491:3 2527:12 SHEEHAN [31] 2416:16 2487:3,5, 8,14,16 2489:12 2490:6,15,20 2491:1 2492:19 2493:6 2499:1 2502:18 2503:4 2510:15 2517:19 2526:10 2532:8 2539:10 2540:11,18,19 2541:17 2543:24 2545:8,10 2550:5,5,7 Sheehan's [8] 2490:22 2498:25- 2503:10 2510:3,18 2537:11,21 2538:12 sheet [4] 2444:5,7,8,12 Sheraton [1] 2414:8 Sherwin [2] 2416:2 2532:8 shifted [1] 2475:9 ship [1] 2466:12 shipment [4] 2468:22 2471:20, 21 2477:4 shipments [2] 2471:2 2525:19 shipped [8] 2434:9,15,22 2462:21 2466:23 2467:17 2473:24 2477:21 shipping [11] 2432:13,25 2433:5, 5 2434:2 2435:19 2443:14 2469:2 2513:2,4,7 short [1] 2467:17 short-term [1] 2442:25 shortfall [2] 2462:11 2465:11 shouldn't [1] 2522:17 show [13] 2501:12,13,16 2503:24 2507:12 2511:24 2516:1,25 2517:7 2519:14 2520:6 2534:20 2537:15 showed [3] 2476:24 2505:14 2506:25 showing [4] 2423:23 2502:17 2513:17 2520:11 shown [5] 2505:4,25 2513:18,25 2520:23 shows [2] 2515:6 2537:25 shutdown [3] 2428:5 2430:14 2434:9 shutting [1] 2428:25 side [4] 2552:2,3,4,4 sides [1] 2463:14 signed [2] 2467:8,11 significance [1] 2544:12 significant [9] 2450:4 2453:9 2493:16 2508:23 2511:9,13 2522:7,9 2528:5 significantly [3] 2507:20 2524:8 2525:8 Silberg [99] 2416:11,18 2419:17 2423:11,22 2424:14 2426:1 2446:4,21,22 2454:2,25 2455:3, 11,15,23 2456:17,20 2459:24 2461:8 2467:23 2469:8,23 2472:12,22 2474:1 2480:15 2481:4 2485:8 2486:8,21,25 2488:14,17, 20 2493:1,3,5 2494:22 2498:10, 12,23 2499:5,16 2501:16 2502:16,17,21 2503:10,18 2504:14 2505:4,25 2506:2,9,14,15 2508:18 2510:1,11,22 2511:6,7 2512:9,21 2515:17 2517:2,6,16,21 2518:4,14 2520:21,22 2522:16 2523:3,21,25 2524:9,12,21,25 2525:2,5,7,24 2526:9,17,21 2529:21 2530:6 2536:12 2537:6, 8 2539:2 2540:14 2549:12,14 2551:14 Silberg's [4] 2418:20 2492:9 2537:22 2543:25 similar [3] 2442:18 2500:19 2515:13 Similarly [1] 2509:19 simple [2] 2437:15 2500:19 simply [6] 2462:25 2483:22 2491:20 2526:11 2544:17 2545:4 since [9] 2420:15 2421:11 2442:25 2456:10 2489:9 2509:3 2521:23,24 2523:5 single [1] 2436:7 sir [18] 2418:17 2423:16 2456:23 2474:9 2478:13 2487:3,6 2491:17 2493:13 2497:6 2534:7 2537:8 2540:14 2545:14,18 2546:5,8 2550:8 sit [1] 2436:17 site [56] 2417:25 2428:13,15 2431:2,7,18,25 2432:22 2435:2 2438:7 2440:3,8 2450:1,15 2452:3 2457:7 2458:1,7,9 2459:21 2465:21,25 2466:1 2467:1,19,22 2469:7,15,20,22 2470:21,25 2471:5,13 2477:1 2481:21 2486:15 2507:5,14 2508:2,10 2514:19 2524:7,14,18 2525:8 2528:20 2532:18,24 2535:12 2536:22,24, 25</p>	<p>24 2541:13 2542:25 2546:20 site-wise [1] 2431:12 sites [4] 2434:19 2482:5 2528:10, 22 situation [7] 2421:7 2453:12 2514:23 2516:10,10 2522:5 2547:4 six [5] 2506:21 2518:16,16 2519:3 2549:19 size [7] 2431:15,19,19 2524:7,18 2535:4 2536:17 SKULL [5] 2415:18 2486:10 2523:10,11,14 slow [1] 2454:7 small [2] 2433:1 2547:23 smaller [5] 2431:20 2471:8 2508:4 2524:8 2525:8 smear [1] 2433:14 so-and-so [1] 2540:5 Society [1] 2438:10 somehow [1] 2537:1 someone [2] 2437:9 2462:21 sometime [1] 2477:11 sometimes [2] 2539:23,24 somewhat [2] 2431:20 2446:7 soon [2] 2530:22 2539:4 sorry [16] 2422:19 2474:6 2488:6, 7 2489:15 2493:19 2495:11 2498:9,25 2502:8 2504:21 2507:25 2512:9 2513:1 2526:17 2542:22 sort [13] 2423:5 2451:17 2462:14 2492:2 2500:15,21 2513:14,19, 23 2516:2,24 2519:1 2522:22 sorts [3] 2433:9 2500:1,12 sounds [1] 2528:25 source [4] 2454:12 2519:12 2543:8,22 sources [1] 2507:16 South [4] 2414:9 2415:6 2434:22 2435:5 sovereign [2] 2453:25 2454:4 speaks [1] 2454:3 specific [5] 2450:25 2452:22 2476:1 2477:25 2497:22 specifically [4] 2448:9 2449:15 2457:8 2470:14 specifics [2] 2505:21 2517:2 specified [1] 2500:3 speech [1] 2423:5 speed [1] 2523:16 spelling [1] 2489:12 spent [8] 2428:9,10 2429:10 2443:14 2468:19 2486:14 2515:18 2520:24 SPIELBERG [1] 2415:9 square [4] 2524:2,8 2525:9 2535:1 staff [26] 2418:8 2419:6,9,18 2420:9,21 2421:12,20,24 2422:3, 4,6,20 2438:7 2439:5 2460:15 2474:5 2478:25 2479:10 2490:4 2526:24 2529:12 2532:9 2540:15 2549:22 2550:17 staff's [3] 2478:16 2530:16 2551:3 staffing [5] 2429:7 2430:4,5,5,7 stage [1] 2430:23 stance [2] 2442:19,22 stand [9] 2423:12 2478:19 2494:14 2495:20 2510:18 2511:3 2545:22 2550:11 2552:9 standards [1] 2443:15 stands [1] 2455:18 start [4] 2417:20 2426:4 2429:2</p>
---	---	---

<p>2471:2 starting ^[1] 2437:24 STATE ^[27] 2415:3 2419:6,7,10, 18 2420:4,10 2422:5,5,8,19,20 2427:18 2428:3 2436:4 2450:13 2451:15 2455:1,3 2470:4 2481:7, 8 2487:9,16 2527:22 2533:14 2538:6 state's ^[9] 2419:23 2420:21 2422: 10 2499:3,6 2508:19 2509:8 2530:16 2539:7 stated ^[8] 2420:7 2432:4 2460:23 2465:20 2470:6 2482:17 2484:7 2517:20 statement ^[12] 2439:13 2444:11 2476:15,19 2479:13,16 2498:23 2499:6 2528:15,19 2534:24 2547:10 statements ^[5] 2417:13 2444:3, 24 2496:24 2539:23 STATES ^[6] 2414:1 2422:14 2440:6 2446:13 2447:16 2448:6 stating ^[6] 2532:17 2533:21,24 2535:2,11 2545:25 station ^[1] 2507:14 status ^[1] 2538:25 stay ^[4] 2476:1 2477:8 2537:1 2540:1 stayed ^[1] 2464:21 stays ^[1] 2496:17 steel ^[1] 2513:15 step ^[1] 2444:1 steps ^[1] 2458:5 still ^[10] 2423:1 2428:23 2431:3 2433:5,20 2471:21 2493:8 2494: 3,15 2541:9 Stone ^[1] 2432:18 Stop ^[1] 2416:4 Storage ^[21] 2414:6 2417:5,17 2428:21,23 2429:10 2430:25 2431:9 2441:14 2451:6 2462:22 2468:19 2471:1,17,19 2472:1,5 2508:22 2512:23,24 2513:2 store ^[1] 2469:7 stored ^[3] 2431:1 2453:9 2528:8 storing ^[1] 2471:25 strange ^[2] 2528:21 2529:3 strike ^[11] 2439:18 2447:19 2469: 16 2479:22 2510:2,13 2526:4 2536:13,18 2537:5,21 strong ^[1] 2438:21 structural ^[1] 2434:10 structure ^[7] 2458:15,15 2459: 14 2473:10,14,16,19 structures ^[1] 2429:20 studied ^[3] 2481:18 2505:23 2516:10 studies ^[21] 2512:21 2513:5 2514:9 2515:19 2516:1,24 2517: 3,5,6,8,10,15,17,20,22 2518:6 2519:16 2521:21 2544:18,24 2545:1 study ^[11] 2512:24 2516:20 2517: 2 2518:3,10,15 2519:4,20 2521: 18,19,22 stuff ^[3] 2514:18 2524:17 2542:5 subject ^[6] 2478:14 2484:17 2486:5 2505:11 2506:9 2551:20 subjects ^[2] 2514:5 2544:7 submits ^[1] 2463:5 submitted ^[2] 2430:1 2463:9 subsequent ^[3] 2453:3 2464:23 2477:22 substantial ^[5] 2433:2 2509:14 2515:10 2522:21 2548:6</p>	<p>succeeded ^[1] 2475:10 success ^[1] 2475:1 sufficient ^[3] 2446:16,20 2497: 14 suggest ^[1] 2420:5 suggesting ^[1] 2535:6 suggestion ^[1] 2532:25 summer ^[1] 2420:25 supervision ^[1] 2424:3 support ^[2] 2522:18 2531:5 supposed ^[1] 2418:1 surety ^[4] 2482:10 2485:16,17,24 surprise ^[2] 2483:9 2524:7 surprised ^[1] 2524:10 surprising ^[1] 2474:8 surrounding ^[1] 2515:10 survey ^[5] 2431:25 2432:1 2433: 14 2452:24 2458:8 surveys ^[1] 2436:22 suspect ^[1] 2523:22 swear ^[2] 2478:20 2490:12 switch ^[1] 2420:24 sworn ^[8] 2423:15,19 2479:1 2480:6 2487:6,10 2491:12 2550: 18 synonymous ^[1] 2469:15 system ^[1] 2513:6 systems ^[3] 2429:19 2431:12 2433:5</p> <p style="text-align: center;">T</p> <p>table ^[5] 2476:23 2502:4 2520:22 2529:14 2540:19 tail ^[1] 2496:1 tailings ^[1] 2525:22 talked ^[3] 2434:2 2466:5 2496:12 talks ^[2] 2442:4 2505:5 tank ^[3] 2522:12,23 2523:16 tanks ^[1] 2523:1 task ^[1] 2436:19 tasks ^[3] 2433:8,9,15 taxes ^[1] 2476:19 technical ^[4] 2417:9 2517:18,19 2518:6 technique ^[1] 2437:18 techniques ^[1] 2438:17 technological ^[1] 2539:15 technologies ^[1] 2440:25 technology ^[10] 2427:4 2437:9 2438:4,11,24 2440:2 2443:13 2496:5 2514:12,16 tells ^[1] 2533:11 ten ^[2] 2442:14 2530:1 ten-minute ^[1] 2472:14 Tennessee ^[1] 2434:16 term ^[12] 2431:6 2432:7 2449:18 2457:25 2458:13 2463:22 2465: 23 2467:2,4 2468:12 2471:11 2519:12 terminate ^[1] 2458:10 terminated ^[3] 2458:4 2469:11 2471:15 terminates ^[2] 2473:23 2483:21 termination ^[7] 2457:17,19 2468: 8 2483:23 2486:15,24,25 terminus ^[1] 2466:9 terms ^[27] 2429:21 2431:19 2445: 25 2450:19,21,25 2451:12 2452: 4,11,16 2458:16,24,25 2459:5,19 2467:2 2468:7,20 2469:19 2482: 23 2484:10 2496:11 2499:18 2514:16 2530:4,15 2543:20 terribly ^[1] 2517:15 Test ^[1] 2454:19 tested ^[1] 2457:7 testified ^[18] 2423:20 2446:10</p>	<p>2455:6 2469:9 2479:2 2483:16 2487:11 2503:5,8 2505:20 2510: 6,16 2516:23 2517:4,19 2522:14 2537:13 2550:18 testify ^[3] 2469:12 2483:7 2503: 15 testifying ^[4] 2499:2,2 2503:16, 18 testimonies ^[1] 2480:22 testimony ^[92] 2417:8,19 2418:8 2421:24 2423:24 2424:8,11,17, 22 2425:1 2427:24 2436:4 2455: 1,17 2468:2 2474:15 2479:11,14, 20,25 2480:5,6,10,17 2481:19 2483:8 2486:5 2487:15,20,24 2489:6,7,10,20,23 2490:1,16, 18,21,23,23 2491:2,2,5,12 2492: 1,3,5,16,19 2493:7,15,15 2494: 25 2495:3,20 2496:6 2503:11,13 2505:24 2510:3,4,8,13,17 2511: 3,7 2512:22 2517:12 2518:7,8 2519:9 2521:5,6,10 2522:18 2526:5 2530:5 2531:22 2532:14 2537:15,19,19,24 2538:8,9 2544: 11 2545:11,13 2549:11,21 testing ^[3] 2454:23 2457:4,5 tests ^[2] 2457:9 2519:12 text ^[1] 2502:13 theory ^[1] 2466:9 there'd ^[1] 2521:17 there's ^[31] 2418:22 2421:19 2423:6 2430:9 2434:16 2438:16, 24 2439:12 2442:3 2449:15 2451:5 2455:7,7 2457:2,3 2458: 5 2462:11 2468:25 2474:23 2483:21 2486:22 2497:24 2510: 12 2511:14,21 2512:11 2523:13 2536:7 2543:4,19 2546:25 Therefore ^[7] 2453:13 2471:7 2509:10 2510:7 2513:13 2542:6 2543:14 thinking ^[3] 2460:9 2501:8 2516: 7 third ^[15] 2466:14,15,16,20,24 2477:5,10 2488:2,15,21 2520:6 2521:2,3 2522:7 2527:19 thirty-five ^[2] 2502:10,10 thorough ^[1] 2437:11 though ^[3] 2476:2 2512:9 2516:8 thoughts ^[1] 2481:24 three ^[18] 2436:6 2446:2 2473:18 2488:25 2504:18 2505:2 2506: 21 2512:21 2520:2,3,5,13,14,14, 25 2521:3,4 2526:25 thrust ^[4] 2504:22 2509:1 2521:5, 18 Thursday ^[2] 2417:7,12 tie ^[2] 2453:8,14 tied ^[3] 2466:17,18 2536:23 timing ^[1] 2429:21 today ^[10] 2417:19 2479:20 2491: 16 2495:3,6,20 2539:2 2545:11 2550:9 2552:8 together ^[5] 2424:1,9 2437:19 2453:8 2494:17 took ^[2] 2435:18 2482:9 top ^[1] 2479:22 topic ^[1] 2508:21 Tort ^[1] 2454:3 total ^[3] 2428:14 2435:11 2520: 17 totally ^[2] 2436:23 2492:1 towards ^[2] 2437:5 2471:8 trace ^[1] 2452:21 training ^[3] 2453:19 2454:20,23</p>	<p>transcript ^[2] 2424:16 2480:20 transit ^[2] 2515:7 2521:20 transportation ^[2] 2512:25 2513: 20 trappings ^[1] 2541:8 treat ^[1] 2475:19 Tribes ^[2] 2417:11 2418:9 trigger ^[1] 2460:20 triggering ^[2] 2466:5,13 Trojan ^[5] 2501:7 2504:19 2505: 16,21 2506:20 true ^[30] 2422:12 2424:5 2439:15, 16,19 2443:3 2449:9 2454:18,22 2477:14 2480:1 2485:16 2487:7 2491:17,18 2501:18 2503:14 2505:15 2511:12 2516:8,19 2519:19,22 2520:17 2522:10 2525:7,10 2527:25 2533:5 2535: 9 try ^[4] 2418:5 2444:1 2472:10 2506:15 trying ^[9] 2440:24 2456:24 2468: 9 2469:17 2501:9 2503:19 2512: 13 2532:23,25 Tuesday ^[1] 2414:11 Turk ^[29] 2416:2,20 2418:14,18, 25 2419:21 2420:19 2422:9 2481:14 2512:10,15 2526:2 2530:7,19,21 2531:4,7,14,18 2532:2,3,7,8 2534:6,13 2535:18, 22 2536:12 2538:14 Turk's ^[2] 2537:23 2543:25 turn ^[2] 2527:18 2538:5 turned ^[1] 2462:23 twenty ^[1] 2548:14 twice ^[1] 2438:10 two ^[22] 2417:9 2450:3 2466:17 2467:18 2470:25 2474:23 2483: 6 2488:1,4 2503:2,5 2507:18 2519:15 2520:4,8,13 2526:19 2529:14 2540:23 2548:14 2552: 7,8 type ^[6] 2434:4 2437:16,18 2502: 6 2516:19 2544:20 types ^[3] 2459:9,25 2521:6 typical ^[1] 2445:14 typo ^[1] 2479:22</p> <p style="text-align: center;">U</p> <p>U.S. ^[2] 2416:1 2471:2 ultimate ^[1] 2457:22 Um-hum ^[2] 2430:16 2444:14 unaware ^[3] 2497:17 2522:14,16 uncertain ^[1] 2534:23 uncertainties ^[3] 2493:25 2494: 3 2540:10 uncertainty ^[9] 2494:16 2516:13 2528:19 2532:23 2533:6,12 2535:17 2537:16 2545:17 under ^[22] 2423:13,15 2424:3 2440:12 2443:7 2451:9,22 2452: 11 2453:15 2454:18 2456:6 2469:6 2475:2,25 2482:16 2487: 6,20 2510:14 2514:8,10 2540:19 2550:13 underlies ^[1] 2439:21 underlying ^[1] 2439:17 understand ^[20] 2418:12,14,21 2422:12 2432:6 2456:18 2469: 17 2486:20 2504:8 2512:5,19 2518:3 2530:20,21 2532:13,16 2548:18,19 2549:4 2551:22 understanding ^[17] 2419:5 2428:8 2440:15,21 2441:8,9,9 2442:5 2483:23 2499:7 2503:19 2506:17 2507:19 2508:7 2525:</p>
---	---	--	--

17 2532:20 2546:9
understands ^[1] 2455:22
understood ^[3] 2420:7 2468:1
 2549:10
undoubtedly ^[1] 2441:17
unexpected ^[1] 2528:23
unfair ^[2] 2422:7 2505:22
unit ^[1] 2477:21
UNITED ^[1] 2414:1
universities ^[1] 2439:2
unless ^[3] 2421:13 2535:23 2549:22
unreasonable ^[1] 2454:8
unrelated ^[1] 2470:5
unspecified ^[1] 2505:13
until ^[8] 2421:9 2440:25 2449:25 2467:8 2469:10 2471:14 2473:23 2547:8
unusual ^[1] 2483:10
up ^[58] 2418:6 2421:14,15,22 2422:24 2430:5 2432:16,22 2439:22,23 2451:19,25 2452:10,10,20 2454:9 2455:14 2458:22 2459:16 2460:18 2462:9 2465:11 2467:8 2482:13 2483:20 2484:8,18 2485:19 2487:4 2489:9 2490:7,10 2492:9 2497:15,21,23,24 2498:16 2501:10 2509:12,23 2516:6 2525:12 2527:3 2531:12 2538:20 2541:15,25 2542:1,7 2543:5,7,15,18,22 2546:17 2548:14 2552:8
update ^[2] 2436:20 2462:24
updated ^[1] 2460:11
urban ^[1] 2521:22
usage ^[8] 2459:15 2465:21,23 2467:19 2469:15,19,21,22
useful ^[3] 2419:23 2420:2,21
usefulness ^[1] 2526:5
user ^[1] 2450:1
users ^[1] 2450:9
uses ^[1] 2435:1
using ^[3] 2465:24 2516:24 2523:7
UT ^[1] 2415:7
Utah ^[17] 2414:10 2415:3 2417:10,11 2418:9 2423:9,25 2424:18 2454:19 2455:5 2478:17 2479:11 2481:7 2487:9,16,17 2489:17
utilities ^[1] 2505:17
utility ^[2] 2473:21 2475:12
utility's ^[1] 2473:24
utilized ^[1] 2443:12

V

VALLEY ^[5] 2415:18 2486:10 2523:10,12,14
value ^[7] 2440:8 2443:22 2444:4,21 2445:3 2476:18 2546:2
variable ^[1] 2468:23
variety ^[2] 2523:6,23
various ^[1] 2459:19
vendor ^[3] 2434:16 2438:19,19
verb ^[1] 2479:24
verifications ^[1] 2436:5
verify ^[1] 2469:14
version ^[1] 2451:2
versus ^[1] 2503:21
viable ^[1] 2442:18
view ^[2] 2417:16 2547:12
vintage ^[6] 2426:11 2432:5,7 2495:7,9 2497:5
vintaging ^[1] 2497:2
vita ^[1] 2424:23
vitae ^[1] 2489:16
Vitro ^[1] 2525:22

volunteered ^[1] 2491:24
vote ^[1] 2463:1
vulnerable ^[1] 2515:8

W

wage ^[1] 2437:6
wages ^[1] 2440:25
wait ^[4] 2421:9 2452:6 2456:3 2525:2
waiver ^[1] 2454:4
wanted ^[5] 2456:20 2466:7 2534:14,20 2545:24
wants ^[2] 2469:20 2517:17
war ^[1] 2456:1
warning ^[1] 2515:11
Wasatch ^[1] 2414:9
Washington ^[6] 2415:11,16 2416:5 2435:2,6 2532:10
waste ^[6] 2434:4,4,5,6 2472:25 2525:20
water ^[4] 2501:20,21 2502:11 2519:4
water-cooled ^[3] 2516:21 2518:13 2519:7
way ^[23] 2421:4 2431:13 2437:10,11,13 2456:8 2459:2 2462:24 2464:14 2467:16 2468:23 2497:9 2498:3 2499:9,10 2500:2,8 2502:22 2516:13 2537:17 2540:2,19 2552:9
web ^[1] 2417:25
Webster ^[1] 2432:18
Wednesday ^[1] 2491:6
week ^[2] 2417:7 2493:7
weeks ^[1] 2491:14
weeks' ^[1] 2420:25
weighing ^[1] 2544:10
weight ^[5] 2510:19 2511:5 2517:14 2537:19 2538:9
weighted ^[1] 2437:5
welcome ^[2] 2529:21 2534:7
West ^[2] 2414:9 2415:20
wet ^[2] 2428:20,23
whatever ^[12] 2421:10 2449:6 2461:17 2464:7,11 2495:21 2504:12 2507:15 2510:19 2511:5 2515:9 2548:13
whatnot ^[1] 2500:14
Whereupon ^[3] 2424:25 2480:21 2492:18
whether ^[27] 2438:4 2440:10,17 2442:13 2446:9 2456:21 2457:7 2468:5,6,10 2469:18 2472:5,24 2473:2,3 2490:9 2499:18,23 2502:25 2514:4 2515:12 2517:8,9 2518:12 2524:10 2530:8 2543:6
whichever ^[1] 2507:16
whole ^[2] 2418:5 2437:22
widely ^[1] 2523:18
will ^[82] 2418:4 2421:15 2427:5,8,13 2429:12 2436:6,11 2438:6,17 2439:13,16,19 2440:8,22 2441:17 2445:10 2446:11,12 2447:12,16 2448:6 2450:14,18,20,21 2451:6,19,20 2452:4,24,25 2453:1 2455:1,3,8 2457:19,20 2458:23,25 2459:5,7,9,25 2461:5 2462:25,25 2463:16 2465:9,22 2468:11 2469:22 2471:21 2472:1 2473:10,20,25 2474:11 2479:9 2480:19 2481:22,25 2483:19 2485:11 2486:14 2489:7 2490:10,22 2492:10,16 2496:25 2506:7,8 2516:14,15 2529:2 2531:8,8 2537:11 2546:11 2548:17 2549:

18
willing ^[3] 2441:13,23 2442:13
willingness ^[2] 2441:1 2529:19
Wilmot ^[2] 2516:20 2518:10
wiping ^[1] 2433:14
Wisconsin ^[2] 2447:5,12
wish ^[4] 2449:16 2487:23 2504:13 2535:24
wishes ^[1] 2506:7
withhold ^[1] 2422:21
within ^[6] 2426:18 2434:11 2438:24 2482:6 2497:18 2542:18
Without ^[6] 2431:7 2443:23 2497:15 2508:16 2531:5 2534:11
WITNESS ^[115] 2416:8 2419:8,10 2422:13 2423:18 2426:1 2447:6 2456:24 2461:12 2469:9 2474:20,22 2475:7,18 2479:7,8,10,15,18,21 2480:3,4,7,8 2482:2,17,25 2483:1,11,14,25 2484:1,10 2485:19,19,22 2487:7,9 2488:17,22 2491:18,22 2498:9 2499:14 2502:24 2503:15,19 2504:2,4,10 2505:19,22,25 2506:2,13 2508:16 2509:8 2510:6,8 2512:8,19 2516:23 2517:3,9,18 2518:3,5,9 2522:13,19 2523:22 2524:10,15 2526:15,18 2530:3,11,22 2531:7 2534:2,10,12 2535:19 2536:1,8,9,14,20 2540:23 2541:21 2542:10,19 2544:4,6,13 2545:14,18,20,23 2546:5,8,19,23 2547:15,18,22 2548:3,8,20 2550:5,25 2551:1,4,5,10
witness's ^[2] 2503:13 2517:22
witnesses ^[8] 2420:8 2421:12 2422:7,10,11 2478:21,25 2550:17
wondering ^[1] 2519:14
Wood ^[22] 2418:14 2478:19,24 2479:8,11,16,18 2480:4,7,17,23 2482:2,25 2483:11,25 2484:10 2485:19,22 2550:11,16 2551:1,5
word ^[3] 2460:10 2479:22 2489:3
words ^[7] 2431:6 2432:13 2433:13 2464:25 2465:25 2477:8 2509:21
work ^[14] 2432:9,11,15 2439:7 2444:21 2468:9,11 2501:2,2 2513:17,22 2533:1 2544:8 2549:2
worked ^[2] 2443:13 2548:17
working ^[1] 2439:2
world ^[1] 2513:19
worst ^[1] 2520:9
worst-case ^[1] 2521:10
worth ^[1] 2518:1
wrap ^[1] 2531:12
wrapped ^[1] 2538:20
written ^[16] 2424:25 2429:23,24 2462:25 2468:7 2469:18,19 2480:5,21 2490:19,19,24 2492:18 2495:3 2540:21 2544:8

Y

year ^[36] 2435:20 2436:7,21 2437:1,2,7,22 2438:10 2441:21 2442:7 2447:17 2448:7 2460:12,17 2464:11,12,20,23 2466:2,8,23 2467:18 2476:20 2477:1,11,19,22,22 2541:1,23,24 2546:16,17 2547:1,3 2548:12
year's ^[6] 2426:14 2437:21 2447:23 2448:7 2495:9 2497:4
years ^[15] 2442:14,14 2449:21 2450:3 2461:14 2467:14 2468:7

2471:7 2475:10 2476:18 2477:3,13 2483:22,22 2514:13
years' ^[1] 2449:18
yourself ^[2] 2432:19,21

Z

zero ^[10] 2445:12,14,18 2533:13 2534:21,22 2537:20 2538:3 2544:22 2545:3