

**ORIGINAL**  
**UNITED STATES**  
**NUCLEAR REGULATORY COMMISSION**

---

**IN THE MATTER OF:**

METROPOLITAN EDISON COMPANY  
TMI NUCLEAR STATION, UNIT 1

**DOCKET NO:**

50-289-SP

**LOCATION:** HARRISBURG, PA

**PAGES:** 33,314 - 33,394

**DATE:** FRIDAY, JANUARY 11, 1985

---

*TR-01*

*Add 1 copy to ASLBPE/W-439*

*o/i*

**ACE-FEDERAL REPORTERS, INC.**

*Official Reporters*  
444 North Capitol Street  
Washington, D.C. 20001  
(202) 347-3700

8501160271 850111  
PDR ADOCK 05000289  
T PDR

**NATIONWIDE COVERAGE**

Sim 1-1

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

----- X  
 :  
 In the Matter of: :  
 : Docket No. 50-289-SP  
 METROPOLITAN EDISON COMPANY : (Restart Remand on  
 : Management)  
 (Three Mile Island Nuclear :  
 Station, Unit No. 1) :  
 :  
 ----- X

The Library, Richards Hall  
 University Center  
 2986 North Second Street  
 Harrisburg, Pennsylvania 17110

The hearing in the above-entitled matter resumed,  
 pursuant to recess, at 9:07 a.m.

BEFORE:

JUDGE IVAN W. SMITH, Chairman  
 Atomic Safety and Licensing Board  
 Nuclear Regulatory Commission  
 Washington, D. C. 20555

JUDGE WHELDON J. WOLFE, Member  
 Atomic Safety and Licensing Board  
 Nuclear Regulatory Commission  
 Washington, D. C. 20555

JUDGE GUSTAVE A. LINENBERGER, JR., Member  
 Atomic Safety and Licensing Board  
 Nuclear Regulatory Commission  
 Washington, D. C. 20555

SueTraylor

1

APPEARANCES:

2

On Behalf of the Licensee:

3

ERNEST BLAKE, ESQUIRE  
WILBERT WASHINGTON, II, ESQUIRE  
DEBORAH B. BAUSER, ESQUIRE  
JOHN NASSIKAS, ESQUIRE  
Shaw, Pittman, Potts & Trowbridge  
1800 M Street, N. W.  
Washington, D. C. 20036

5

6

7

On Behalf of Three Mile Island Alert:

8

LOUISE BRADFORD, pro se  
Three Mile Island Alert  
315 Peffer Street  
Harrisburg, Pennsylvania

9

10

11

JOANNE DOROSHAW, ESQUIRE  
The Christic Institute  
1324 North Capitol Street  
Washington, D. C. 20002

12

13

On Behalf of the NRC Staff:

14

JACK R. GOLDBERG, ESQUIRE  
MARY E. WAGNER, ESQUIRE  
Office of the Executive Legal Director  
Nuclear Regulatory Commission  
Washington, D. C. 20555

15

16

17

On Behalf of the Commonwealth of Pennsylvania:

18

THOMAS Y. AU, ESQUIRE  
Bureau of Regulatory Counsel  
THOMAS E. POLLOG  
Bureau of Radiation Protection  
Department of Environmental Resources  
101 South Second Street  
503 Executive House  
Harrisburg, Pennsylvania 17120

19

20

21

22

23

On Behalf of the Union of Concerned Scientists:

24

WILLIAM S. JORDAN, III, ESQUIRE  
Harmon, Weiss & Jordan  
2001 S Street, N. W., Suite 430  
Washington, D. C. 20009

25

Sim 1

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

APPEARANCES: (Continued)

On Behalf of the Governor's Office and the  
Commonwealth of Pennsylvania:

THOMAS D. REES, ESQ.  
Deputy General Counsel  
Commonwealth of Pennsylvania  
Office of the General Counsel  
Harrisburg, Pennsylvania

\* \* \* \* \*

Sim 1

C O N T E N T SWITNESSES                      DIRECT    CROSS    REDIRECT    RECROSS    BOARD

JULIEN M. CHRISTENSEN )  
 ERIC F. GARDNER        )  
 FRANK L. KELLY         )  
 WILLIAM R. KIMEL       )  
 ROBERT E. UHRIG        )

## (REBUTTAL EXAMINATION)

By Ms. Bauser            33,319  
 By Mr. Jordan                    33,321  
 By Ms. Wagner                   33,324  
 By Mr. Au                        33,347  
 By Ms. Bauser                            33,349  
 By Ms. Wagner                                33,353

RONALD A. KNIEF        )  
 - and -                    )  
 BRUCE P. LEONARD       )

By Ms. Bauser            33,362  
 By Mr. Jordan                    33,365  
 By Mr. Au                        33,372  
 By Ms. Wagner                    33,376

## LAY-IN DOCUMENTS

DOCUMENT IDENTIFICATION                      FOLLOWS PAGE

Corrected Rebuttal Testimony of  
 Reconstructed OARP Committee                      33,320

Rebuttal Testimony of Messrs. Knief  
 and Leonard    33,364

E X H I B I T S

(None)

24

25

P R O C E E D I N G

(9:07 a.m.)

1  
2  
3 JUDGE SMITH: Mr. Jordan, have you seen the  
4 corrected testimony? Have you had a chance to look at it?

5 MR. JORDAN: I am looking at it right now. We  
6 did discuss it on the phone. I just wanted to look it over.

7 (Mr. Jordan peruses document)

8 JUDGE SMITH: Is everyone ready to proceed. I  
9 was waiting to see if you had a chance to look at the corrected  
10 testimony.

11 MR. JORDAN: I have, Your Honor.

12 JUDGE SMITH: Is everyone ready to proceed?

13 (No response)

14 JUDGE SMITH: All right. Is there any preliminary  
15 business?

16 MR. JORDAN: I guess I should say as corrected,  
17 we do not object to its admission.

18 MR. AU: I have one matter of preliminary nature.

19 JUDGE SMITH: All right.

20 MR. AU: Just to let the Board know, I have signed  
21 off on a Motion to Disqualify this morning, and expect copies  
22 will be delivered here in about an hour.

23 JUDGE SMITH: All right. Thank you.

24 MS. MOROSHOW: Judge Smith, Ms. Bradford will not  
25 be attending the hearing today. She had thought she would be

1 able to last night and had prepared for today, but she is in  
2 considerable pain this morning, and I have indicated she will  
3 not be able to come, and it would not be worth it for the  
4 panel to return just on her behalf if they are completed today.  
5 The cost involved in having that done would be significantly  
6 greater than the benefit of her questioning. At least, that  
7 is what she indicated. So that is her position on that, and  
8 it will not be possible for me to conduct an examination.

9 I may also not be able to attend all the morning  
10 session because of other commitments.

11 JUDGE SMITH: Okay.

12 MR. GOLDBERG: I have a brief preliminary matter.  
13 In connection with the TMIA request that an interview be added  
14 to the Joint Mailgram exhibit, I informed TMIA of the additional  
15 interviews which the Staff would want added if proposed  
16 interview that TMIA would like added is, in fact, added.

17 TMIA does not have those, so is not in a position  
18 to state whether they have any objections to adding additional  
19 ones that the Staff would add, so we are just not able to  
20 resolve it at this time.

21 I will make copies of those additional interviews  
22 available to TMIA and we will have to resolve it some time  
23 after today.

24 JUDGE SMITH: All right. Anything further?

25

(No response)

1 JUDGE SMITH: All right. So we are ready for  
2 your testimony.

3 Whereupon,

4 JULIEN M. CHRISTENSEN,

5 - and -

6 ERIC F. GARDNER,

7 - and -

8 FRANK L. KELLY,

9 - and -

10 WILLIAM R. KIMEL,

11 - and -

12 ROBERT E. UHRIG,

13 were recalled as witnesses on behalf of the Licensee, and  
14 having been previously duly sworn, further testified as follows:

XXXX INDEX

15 DIRECT EXAMINATION

16 BY MS. BAUSER: (Continuing)

17 Q I would ask the Committee whether they have had  
18 an opportunity to review their rebuttal testimony, dated  
19 November 28, 1984, which has now been marked 'Corrected' up  
20 in the right hand corner, and has -- on pages 8, 11, 12, 13,  
21 and 14, believed penned modifications to the testimony.

22 Have you had an opportunity, gentlemen, to see  
23 this document?

24 A (Simultaneously) Yes.

25 Q As corrected, does this document represent the

1 testimony prepared by the reconstituted OARP Committee, or under  
2 its supervision for this proceeding?

3 A (Simultaneously) Yes.

4 Q I will ask each of you gentlemen to affirm that  
5 this is the -- that the rebuttal testimony is true and correct  
6 to the best of your knowledge and belief?

7 A (Simultaneously) I do.

8 MS. BAUSER: Mr. Chairman, I move that the rebuttal  
9 testimony of the reconstituted OARP Committee, as corrected,  
10 be admitted into evidence and incorporated into the record  
11 as if read.

12 JUDGE SMITH: You have no other objections?

13 (No response)

14 JUDGE SMITH: The testimony is received.

xx INDEX

15 (Corrected prefiled testimony of the recon-  
16 structed OARP Committee follows)

17

18

19

20

21

22

23

24

25

November 28, 1984

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
METROPOLITAN EDISON COMPANY	)	Docket No. 50-289 SP
	)	(Restart-Management Remand)
(Three Mile Island Nuclear	)	
Station, Unit No. 1)	)	

REBUTTAL TESTIMONY OF THE  
RECONSTITUTED OARP COMMITTEE

Q.1. Has the Committee reviewed the "Testimony of Julius J. Persensky, Joseph J. Buzy and Dolores S. Morisseau on the Remanded Training Issue from ALAB-772"?

A.1. Yes.

Q.2. What is the Committee's view of that testimony?

A.2. The Committee believes the testimony is based to a significant extent on a lack of understanding of what the Committee has done, as well as what the Committee intended to do in reviewing Licensee's TMI-1 licensed operator training program. The Committee considered it unproductive to expend time over the last four months describing its activities in detail in a report or in testimony, preferring instead to spend its time reviewing licensed operator training at TMI. However, at this juncture, in order to clarify the record, the Committee considers it necessary to respond to the Staff's testimony.

Q.3. The Staff witnesses identify in their testimony (A.15) a list of documents they believe the Committee should have reviewed "as background" in order to evaluate the licensed operator training program. Do you agree with this belief?

A.3. Generally, yes.

Q.4. Were these documents reviewed by the Committee?

A.4. For the most part. All but three of these documents (NUREG-0680 (June 1980), Supp. 1 (Nov. 1980) and Supp. 2 (March 1981)) were reviewed as background material, along with other documents, by one or more Committee members.

Q.5. Why didn't the Committee refer to all of these documents in its prefiled testimony?

A.5. Some of these documents were not referred to in the Committee's testimony precisely because they were reviewed as background material. The documents were used for orientation purposes. They were not relied upon in the sense of being the basis for the Committee's conclusions, as reflected in the testimony.

Q.6. The Staff states in its testimony (A.17) that the Committee's evaluation should have included (a) review of training procedures and training materials relevant to the issues in ALAB-772; (b) interviews with training managers, instructors, users and on-the-job supervisors of trainees; (c) systematic observations of classes, simulator instruction and instructors, as well as the administration of exams (written, simulator and oral); and (d) keeping in mind that the Committee

was an independent reviewer. Does the Committee agree with these four Staff views as what it would have been appropriate for the Committee to do?

A.6. The Committee believes all of these activities are appropriate. However, the Committee does not believe all of these activities were necessary in order for the Committee to evaluate the training program. Nevertheless, the Committee has had the opportunity to do most of the activities identified by the Staff.

(a) With regard to training procedures and materials, Mr. Kelly reviewed the ATOG training summary, walk-through program and procedures. Dr. Kimel reviewed the ATOG training summary and walk-through program. Dr. Kimel, Dr. Gardner and Mr. Kelly reviewed the RO and SRO initial and requalification training program descriptions. Dr. Gardner and Mr. Kelly reviewed the GPUN Instructor Development Program, the Instructor Indoctrination/Qualification Training Program, the Instructor Evaluation Procedure, the Leonard Memo (Jan. 1984) on Exam Construction, the procedures on exam control and recent RO and SRO examinations. The Committee has familiarized itself with the work of the T&E Advisory Council. The Committee also, of course, has read the testimony of Licensee's witnesses, which describe the licensed operator training program and related issues, as well as the depositions of Licensee's witnesses and Licensee's interrogatory responses on this issue.

(b) With regard to interviews of appropriate personnel, Dr. Gardner, Mr. Kelly and Dr. Christensen interviewed 5 licensed operator or simulator instructors and approximately 27 licensed RO's and SRO's and 4 replacement operators, including all six shift supervisors who are the on-the-job supervisors. All five Committee members have had significant interaction with the Vice President of Nuclear Assurance, Dr. Long, the Director of T&E, Dr. Coe, the Manager of Plant Training, TMI, Mr. Newton and the Operator Training Manager, Mr. Leonard. Mr. Kelly and Dr. Uhrig spent time with the new Supervisor, Licensed Operator Training, Mr. Maag, discussing training issues with him. The Committee met as a group with Mr. Hukill. In addition, Dr. Uhrig and Dr. Kimel met separately with Mr. Clark and with Mr. Hukill. Mr. Kelly, Dr. Gardner, Dr. Christensen and Dr. Kimel reviewed simulator training with Mr. Irizarry, Simulator Training Manager and with Mr. Boltz, Supervisor of Simulator Training at TMI. The purpose of these interviews was to gain a first-hand impression of the quality of and personnel involved in the licensed operator training program and to get all of these individuals' views about and attitude towards the program.

(c) With regard to classroom observations, the Committee endeavored to sit in on a cross-section of classes given to TMI-1 licensed operators or given by TMI-1 licensed operator instructors. Mr. Kelly and Dr. Gardner were able to observe about 15 classes for licensed operators (as well as a sample of

non-licensed operator classes) and two BPTS classes. In addition, Dr. Kimel and Dr. Christensen each observed several licensed operator classes.

Dr. Christensen went to the B&W simulator in order to observe implementation of the TMI simulator program and, particularly, the instruction given in the classroom and at the simulator to TMI-1 operators. Mr. Kelly also visited Lynchburg for this purpose. All five Committee members were briefed on and observed the use of the BPTS. In addition, Mr. Kelly observed four hours of BPTS training and four hours of demonstration of specific B&W PWR operating characteristics. In addition, Dr. Gardner, Dr. Kimel and Mr. Kelly observed the TMI-1 control board mockup while it was being used as a training device. Mr. Kelly, Dr. Christensen, and Dr. Gardner observed the administration of several exams and verified compliance with the control of exams procedure.

(d) The Committee has never lost sight of the fact that it was an independent reviewer.

Q.7. The Staff testimony (A.22 and A.23) identifies a general evaluation process for evaluating Management/Communications/Attitudes. Do you agree with this process?

A.7. Yes, although perhaps not in the formal quality assurance manner suggested by the Staff. Specifically:

(1) As background or preliminary information, the Committee has reviewed organizational documents to ascertain the structure of the organization.

(2) The Committee has reviewed communication mechanisms through interviews with training managers, personnel and operators.

(3) The Committee has determined the GPUN position on communications by reviewing management memos on the importance of this issue, referred to in the Committee's initial testimony, and by discussing these issues with Mr. Clark, Mr. Hukill, Dr. Long, Dr. Coe, Mr. Newton, Mr. Leonard, Mr. Ross, the licensed operators and the instructors.

(4) Members of the Committee have reviewed training management and staff resumes, employee performance reviews and instructor evaluations, paying particular attention to individuals highlighted by the Appeal Board and individuals in licensed operator training.

(5) Members of the Committee have reviewed documentation of the instructor development program, as well as GPUN training instructor criteria and procedures for evaluation. Instructors have been evaluated in particular by Dr. Gardner (education specialist) and Mr. Kelly (subject matter expert). Dr. Gardner and Mr. Kelly also attended portions of the most recent instructor development program and observed first-hand its structure, content and execution. During this time, Dr. Gardner and Mr. Kelly had the opportunity to obtain several instructors' views of the instructor development program. Dr. Christensen, Dr. Kimel and Mr. Kelly also observed the training of two instructors on the use of the BPTS as an instructional device.

The Committee has not performed a quality assurance check on which instructors have participated in the instructor development program; however, the Committee considers it reasonable to rely on Licensee's statement that all but one of the current TMI-1 licensed operator instructors have participated in this program.

Dr. Gardner and Mr. Kelly have reviewed instructor evaluations. As previously mentioned, a number of operators were interviewed by Committee members. The quality of instruction was discussed.

(6) The TMI training facility has been visited on a number of occasions. Committee members have observed its use.

Q.8. The Staff notes, in particular, that the RHR TMI-1 survey data and Supplement 4 to NUREG-0680 should be reviewed (A-24). Was this done?

A.8. Yes. The Committee reviewed these documents. However, the Committee did not rely on these documents in formulating its views because it felt its first-hand observations were more pertinent. It should be noted that the Committee (Mr. Kelly and Dr. Gardner) also reviewed the notes of Ms. Morisseau, which we understand form the basis for the conclusions about operator attitude in NUREG-0680, Supp. 4, and Ms. Morisseau's deposition, in which these notes were discussed. The Committee also reviewed and placed reliance on GPUN's memorandum responding to the RHR Report.

particularly, the rapport and interaction between instructors and students.

Q.9. Were classes monitored to observe attitudes communicated by instructors and students?

A.9. Yes. We monitored classes to observe attitudes and,

Q.10. What was that attitude?

A.10. Instructors and students were serious-minded and reflected commitment to the process. Rapport and instructor/student interaction were excellent.

Q.11. Did the Committee's interviews of operators parallel the survey question format asked by RHR?

A.11. No. The Committee members did not feel it was necessary or the best alternative to follow the RHR survey format in interviewing operators.

Q.12. How did the Committee check operator pride and enthusiasm?

A.12. The Committee asked questions designed to obtain a sense of operators' pride, enthusiasm and morale, generally. The Committee also asked operators about their perception of other operators' morale.

Q.13. Was instructor professionalism, pride and enthusiasm considered by the Committee?

A.13. Yes.

Q.14. How was instructor professionalism, pride and enthusiasm considered?

A.14. The Committee reviewed instructor resumes, performance evaluations and observed most licensed operator instructors in the classroom. The Committee did not consider it

necessary to evaluate the instructors against GPUN's evaluation form. However, the GPU Nuclear criteria were taken into account.

Q.15. In their testimony (A.34), the Staff witnesses identify the methodology they consider appropriate to generally evaluate issues in the category of Training Systems/Programs. Do you agree that this approach was the appropriate approach for the Committee to use.

A.15. No.

Q.16. Why not?

A.16. The Committee endeavored to review comprehensively and assess the licensed operator training program and process in place today at TMI. The Committee did not attempt to nor could it have "validated" the program, that is, independently establish that every aspect of the program is meeting its intended purpose or is being implemented effectively. The Committee does not believe that, in seeking the opinion of the Committee, the Appeal Board intended the Committee to "validate" or do a quality assurance check on the licensed operator training program. Rather, it is the Committee's impression, in reading ALAB-772, that the Appeal Board sought the collective judgment of a group of individuals each of whom brings to this process considerable expertise in an area of relevance to the issue. The Committee also does not believe that the Appeal Board intended the Committee to perform an accreditation of the licensed operator training program, and the Committee did not

do so. The Committee is well aware of the Licensee's commitment to and current involvement in the INPO accreditation process. The Committee also is aware of the accreditation-type review of training conducted by Data Design Laboratories (DDL), which resulted in a multi-volume assessment of the status of training vis-a-vis the INPO (then applicable) accreditation guidelines. In addition, the Committee is aware of some of the numerous positive NRC Staff reviews of training conducted over the last several years reflected in reports such as NUREG-0680, Supp. 5, the SALP Report and the restart readiness evaluation (84-05). The Committee familiarized itself with these documents. However, the Committee did not consider it necessary or appropriate either to base its conclusions on these independent assessments or to engage in this type of assessment itself. Rather, relying on the individual backgrounds and experiences of each Committee member, the Reconstituted OARP Committee has provided its professional judgment of the quality of the TMI-1 licensed operator training program as requested by the Appeal Board.

Thus, in response to the Staff's testimony, the Committee is aware of but did not review the job/task analyses for TMI-1 licensed operators or compare these specific tasks to procedures, to on-the-job training or to the behavioral learning objectives utilized by the training department. The Committee has seen the job task list and various INPO documents, and has been briefed by GPUN on the status of the accreditation

process. The Committee has sampled lesson plans and hand outs for those classes members of the Committee attended. This sampling was not a quality assurance check. The Committee also has reviewed the ATOG procedures, has reviewed the process used by Licensee for on-the-job training and has observed a sample of simulator training (B&W and BPTS). There are no employee performance reviews of control room operators (CROs), and the Committee did not consider it necessary or appropriate to review shift foremen or shift supervisors' reviews.

Q.17. Does the Committee agree with the Staff's methodology for considering the issue of whether training enhances operators' knowledge or encourages memorization for test-taking purposes?

A.17. No. The Committee does not consider it necessary to do all of the activities suggested by the Staff in order to reach a judgment on this question. Mr. Kelly has extensive experience reviewing licensed operator qualifications. *The Committee does not agree with this Staff's proposed methodology*  
Dr. Gardner is an educational specialist. *Neither of these* *in part because* individuals nor any other Committee member saw any evidence suggesting an inappropriate reliance on memorization in the TMI-1 licensed operator training program. The Committee is aware of the so-called Category T quizzes which the Committee believes were the basis for this original concern. The Committee believes current procedures, which limit repetition in test questions, and the current TMI-1 exam matrix procedure facilitate a proper mix of exam questions. *We observed the manner in which* Classroom instruction

was conducted, and the manner in which students participated attended by Committee members certainly were not drill sessions in the classroom, but, rather, were conducted in a discussion format designed to enhance understanding. <sup>We reviewed</sup> ATOG procedures, which focus on symptoms rather than events, <sup>and</sup> facilitate conceptual understanding. <sup>We observed the use of</sup> The BPTS, <sup>which</sup> is uniquely suited to teaching "basic principles," i.e., understanding the fundamentals of PWR operation. <sup>We observed</sup> The B&W simulator, <sup>which</sup> is utilized to provide "hands on" PWR station experience to the operators. <sup>having familiarized ourselves with the above information, the Committee</sup> In summary, <sup>the Committee believes not</sup> ~~merous indicators suggest there is not an~~ <sup>disagrees with the</sup> ~~inappropriately encour-~~ <sup>Staff's preferred methodology</sup> ~~agement of~~ memorization in lieu of enhancing operators' knowledge.

Q.18. Does the Committee agree with the Staff's methodology for assessing the training facilities?

A.18. No. Committee members have visited the TMI training facility on a number of occasions and have observed the use of a variety of equipment and facilities by the training personnel. The Committee has reviewed and observed portions of the instructor development program, which addresses the proper use of training equipment and facilities. The Committee <sup>observed the uses of various kinds of training</sup> ~~has found no evidence of improper or inadequate use of~~ <sup>equipment in the TMI-1 licensed operator training program.</sup> ~~training equipment; to the contrary, the Committee's experi-~~ <sup>ences evidence a highly appropriate use of this equipment by</sup> ~~ences evidence a highly appropriate use of this equipment by~~ <sup>the Committee considered whether</sup> ~~training personnel.~~ In particular, <sup>the use of equipment is</sup> ~~effectively integrated into the program.~~

Q.19. Did the Committee use the Staff's methodology for evaluating GPUN's examinations?

A.19. No.

Q.20. Why not?

A.20. As previously indicated, the Committee did evaluate the examination process. However, the Committee did not compare the exams to the specific training behavioral learning objectives or to the TMI-1 operator task list. Instead, the Committee gained a first-hand impression of the quality of that process by familiarizing itself with the applicable procedures, (exam security, construction and grading), by reviewing representative examinations for scope, content and structure, by evaluating Licensee's simulator programs and testing process, and by gaining an understanding of the on-the-job training program and the oral exam process. In particular, the Committee noted the involvement of Operations management in the examination process. ~~Based on this information, it is the Committee's judgment that the exam process is appropriate.~~

Q.21. Does the Committee have any comments on the Staff witnesses' conclusions (A.56, A.57)?

A.21. Yes. The Committee has endeavored to specify in more detail its review of training at TMI-1. The Committee collectively has expended over 190 man-days in its Committee work and considers its judgments to be well-founded. It is noteworthy that the NRC Staff considers the approach it recommends to be "similar to that employed by DDL." As previously indicated, DDL did a quality assurance check on training at TMI by correlating the program to INPO's (then applicable)

accreditation guidelines. Their work was extremely detailed in nature and is reflected in a multi-volume report. It is one of a number of studies of training at TMI conducted in the last several years. Others include SALP, NUREG-0680, Supp. 5, 84-05 and the INPO annual evaluation. The Committee did not intend to nor did it embark on this kind of a quality assurance effort, nor is its judgment based on the findings of these reports. However, the Committee <sup>appropriately exercised its</sup> believes its independent collective judgment <sup>in light of what it believes to be</sup> adds <sup>as</sup> to the favorable record, <sup>as</sup> exemplified by these reports, on the quality of the TMI-1 licensed operator training program.

Q.22. Has the Committee read the "Testimony of D[r]. James J. Regan on behalf of the Union of Concerned Scientists" prefiled in this proceeding on November 15, 1984?

A.22. Yes.

Q.23. Does the Committee have any comments to make in response to this testimony?

A.23. Yes. The Committee would like to make a few comments about Dr. Regan's model, developed through his research activities, and its applicability to the situation at hand.

Q.24. What is the Committee's view of Dr. Regan's model?

A.24. The Committee considers Dr. Regan's model to be one (of many) methods for validating a training program, particularly when the program is being designed. The Committee

disagrees with Dr. Regan that all of the issues he raises "must be examined in evaluating a training program such as one for a nuclear power plant," or that these issues must be examined in the precise manner he describes. The Committee believes that it can make reasonable judgments about the quality of the program based on the information, documents, observations and discussions described above.

Q.25. Does the Committee believe it is necessary for a training program to document or standardize all of the information suggested by Dr. Regan?

A.25. No. Documentation and standardization can be useful. However, in a relatively small program, such as the TMI-1 licensed operator training program, where the same training managers and on-the-job managers are exposed to a limited number of trainees over a continuous period of time, these managers gain a first-hand appreciation of the weaknesses and strengths of the individual students which frequently transcends information obtained from predetermined formal questionnaires and checklists. It is therefore unnecessary and counterproductive to require these managers to spend a considerable period of their time engaged in the administrative task of documenting all of their activities and interactions with the operator-trainees, or documenting all of the trainee's activities. This regimen is to be expected in military training programs which have large student enrollments and frequent turnover. In a program such as the relatively small, stable

licensed operator training program, it has much less application.

Thus, for example, the skill and knowledge level of incoming students is usually well understood by Training and Operations managers because individuals have either nuclear Navy or auxiliary operator experience. Both of these environments are extremely familiar to management. Similarly, on-the-job performance is observed continuously, as is classroom, simulator (BPT and B&W) and test (written and oral) performance. The composite of this information, which constitutes a picture of each individual's strengths and weaknesses, is continuously reviewed by Training and Operations. Group or team performance is also evaluated. From this composite, the managers have a sound, although not necessarily standardized, basis on which to judge performance. In this process, the standard of performance method used by management includes elements of behavior to mastery, systems analysis and statistical comparisons, referred to by Dr. Regan (page 8). However, none of these methods is used exclusively, nor need it be.

Q.26. Does the Committee agree with Dr. Regan (p. 12) that Licensee's performance evaluation form ratings "are likely to be unreliable because it becomes very difficult to determine what the ratings actually mean?"

A.26. No. Dr. Gardner and Mr. Kelly have reviewed a number of these forms and consider them to contain useful performance criteria which are quite detailed and comprehensive.

Dr. Regan focuses particularly on behavioral anchors. However, the GPU Nuclear performance evaluation form is accompanied by rating definitions, which are very useful behavioral anchors. Moreover, detailed comments are provided on these forms by reviewers to indicate what the reviewer means. Also, reviewers have the opportunity to discuss their comments with other members of management with whom they regularly interact if there is an issue of concern reflected in the form.

Q.27. Finally, on pages 18 through 21 of his testimony, Dr. Regan outlines the process he would use to answer the questions raised by the Appeal Board. Do you endorse that process?

A.27. The process outlined by Dr. Regan includes references to a number of the activities in which the Committee participated over the past four months. This includes (1) reviewing training material and instruction to assess program content and administration; (2) reviewing instructor qualifications (evaluations and resumes, not mentioned by Dr. Regan); (3) observations of simulator instruction; (4) review of new (ATOG) procedures to determine how they are implemented (consideration was given to whether the training department was sensitive to learning interference problems, referred to by Dr. Regan); (5) examinative review (content and structure); (6) consideration of feedback mechanisms; and (7) assessment of attitude (management, trainers and trainees). However, with regard to some of Dr. Regan's proposals, the Committee did not

undertake nor did it consider it necessary to perform all the suggested procedures.

Q.28. Has anything in the prefiled testimony of the NRC Staff or Dr. Regan changed the Committee's "bottom-line" conclusion, expressed in its Special Report, that the licensed operator training program is adequate to support the restart of TMI-1?

A.28. No.

1 MS. BAUSER: The panel is available for cross  
2 examination.

3 JUDGE SMITH: Mr. Jordan?

4 MR. JORDAN: Thank you.

5 CROSS EXAMINATION

6 BY MR. JORDAN:

7 Q Gentlemen, you mentioned in your rebuttal testimony  
8 that you spoke with Mr. Maag. When did you do that?

9 A (Witness Uhrig) I spoke with him at TMI, and I  
10 believe it was November. I could probably dig up the exact  
11 date. I am not sure exactly what the exact date was, but it  
12 was November. That general time frame.

13 Q I take it it must have been after your testimony  
14 was filed. Your original testimony was filed.

15 A Yes, that is correct.

16 Q I am afraid I am unable to turn to the exact page  
17 number, but is it the -- is it your testimony, Dr. Uhrig,  
18 that you are the one who spoke with Mr. Maag?

19 A I believe there were two of us.

20 A (Witness Kelly) I also spoke with Mr. Maag.

21 Q Was that at the same time?

22 A That was in October. We were not together.

23 Q I see. But those are the two.

24 A (Witness Uhrig) Yes.

25 Q You refer to subject we spent some time on yesterday,

XXX INDEX

1 I guess. NUREG 0680, Supplement 4, and Ms. Morisseau's notes.  
2 When did you -- this would be Mr. Kelly and Dr. Gardner  
3 according to page 7 of your rebuttal, when did you first  
4 see Ms. Morisseau's notes?

5 A (Witness Gardner) I believe I responded to that  
6 yesterday, and my recollection, and I haven't tried to confirm  
7 that, but my recollection was around the first part of  
8 October.

9 End l.  
10 SueT fols.

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Ace-Federal Reporters, Inc.

#2-1-SueT

1 Q I'm sorry. I didn't realize that was a particu-  
2 lar issue that had come up yesterday as opposed to some others.

3 To your recollection, was it before or after --  
4 let me put it this way. At the time you saw her notes, did  
5 you also see her deposition?

6 A (Witness Kelly) No. I saw her notes about the  
7 same time Dr. Gardner did and that was before her --

8 (Witness Gardner) No, I don't believe so.

9 Q And was this about the same time that you first  
10 saw Supplement 4?

11 A Yes.

12 Q On Page 14, Question and Answer 23, the Committee  
13 states that it would like to make a few comments about Dr.  
14 Regan's model developed through his research activity and its  
15 applicability to the situation at hand, and then you go on in  
16 24 to discuss the model.

17 Are you referring to the so-called IQI model?

18 A I believe so. He mentioned several models but  
19 he did talk extensively on the one that you mentioned.

20 MR. JORDAN: That's all I have.

21 JUDGE SMITH: Mr. Au?

22 MR. AU: I have no questions.

23 JUDGE SMITH: Ms. Wagner.

24 CROSS EXAMINATION

25 BY MS. WAGNER:

#2-2-SueT

1 Q Sirs, you indicate on Page 10 of your rebuttal  
2 testimony that the Committee is aware of, but did not review,  
3 the job task analyses for TMI-1 licensed operators or compare  
4 the task to procedures on the job training, et cetera.

5 A (Witness Christenson) I'm sorry. I cannot  
6 hear you.

7 Q Oh, I'm very sorry. At the bottom of Page 10  
8 of the Committee's rebuttal testimony, it is stated that the  
9 Committee did not review the job task analyses for TMI-1  
10 licensed operators.

11 Q Could you explain why the Committee felt that  
12 was not necessary?

13 A Well, I had a briefing by Mr. Gaines on the  
14 process they were going through. And he had in front of him  
15 at that time, and disclosed to us, the INPO generic task  
16 analysis which they were in the process at that time of  
17 modifying in order to make it consistent with the jobs at  
18 TMI. And, as I recall, they were working on five jobs at that  
19 time to make them TMI specific.

20 Q I understand that that exercise has now been  
21 completed. They do have a specific job task analysis for  
22 TMI. I have not reviewed that final product.

23 Q Do you know when it was completed?

24 A No, I do not.

25 Q Is it your testimony that it was not completed as

@2-3-SueT 1 of the time of your review?

2 A At the time Mr. Gaines and two or three other  
3 people there with him reviewed this for us, it had not been  
4 completed. They were in the process of completing it or  
5 working on it.

6 Q Do you recall the time frame of that? Was that  
7 back in June or is that --

8 A I think that was our first visit to the TMI,  
9 which would have been the end of May or the first of June  
10 that we got that briefing.

11 Q Do you recall when you were told that the task  
12 had been completed, the analysis had been completed?

13 A It would have had to have been either at our  
14 August meeting or when I was there in October. But I'm  
15 sorry, I don't know which of those two it was.

16 (Witness Kimel) I believe it is germane to add  
17 that we were very conscious, certainly I was, since INPO is  
18 very concerned, and one of its paramount objectives is to put  
19 the nation's utilities on alert that their training program  
20 should be performance based. I believe that's the root of  
21 your question.

22 And so that was certainly before us all through  
23 our work. And I've already testified to the fact that we  
24 noted the behavioral learning objectives and the large nine-  
25 volume Plant Operations Manual and that those looked like

#2-4-SueT

1 tasks to me. Now, I'm not a psychologist but I think I  
2 understand the performance based training quite well these  
3 days, and that's what I was looking for. I then looked to  
4 see where this Plant Operations Manual existed throughout  
5 the plant because we've already testified to the various  
6 procedures that are used to keep changes into the Plant  
7 Operations Manual which is distributed not only in Operations  
8 but also throughout the training, throughout that plant.

9           And it seemed to me perfectly obvious that that  
10 training program was performance based for yet another reason,  
11 and I want to comment on that.

12           When we talked with Phil Clark at a meeting of  
13 November 8th that Dr. Uhrig testified to yesterday that he  
14 and I had with Dr. Clark, one of the reasons, of course, that  
15 Dr. Long was promoted was because of his -- and this is  
16 unusual in engineering education, especially at the time I  
17 knew him, in the early 70s Dr. Long became very interested  
18 in performance based learning in his own courses at the  
19 University, and that's quite new for a nuclear engineering  
20 educator. And we had many discussions about it at that time.

21           So, it wasn't surprising when he took over the  
22 job in 1980 that one of his first tasks was to put that whole  
23 training program on a performance base basis. And the method  
24 he chooses is slightly different perhaps than job task analysis,  
25 but let me assure you that I am assured -- and I believe the

#2-5-SueT

1 rest of the members of our Committee are assured -- that that  
2 performance is one of the first in the nuclear industry to  
3 become -- maybe the first, I can't document that -- performance  
4 based.

5           And I've tried to go into the background, why  
6 that wasn't a surprise to me personally, because I've known of  
7 Dr. Long's interest in that regard for so long. So, I hope  
8 that casts some light on what you are talking about.

9           The job task analysis is, in my own opinion --  
10 and I have seen the task lists, not only the generic INPO  
11 task list but also the plant specific editions for the  
12 operator training programs, I have not gone back to check  
13 the validity that the tasks and skills that are derived and  
14 associated with those tasks are back into the curriculum. I  
15 have not done a QA check.

16           I am confident that TMI does have in place a  
17 working performance based training program.

18           (Witness Christenson) What Bill said reminded  
19 me of one other thing that I thought we were referring specifi-  
20 cally to the INPO generic analysis and it's modification.  
21 Before that they did what they called -- and I've engaged in  
22 some of these, not here, but other places -- table top task  
23 analysis and walk-throughs.

24           Well, the table top task analysis essentially is  
25 getting all your extras together, examining whatever operations

#2-6-SueT

1 you are looking at, whatever scenarios, and with the collective  
2 intelligence you have there you can come up with a pretty fair  
3 set of tasks and what the people ought to be doing.

4           Now, that was done long ago. I don't know when  
5 that was done. But I remember Dr. Knief telling me at one  
6 time that they had done this table top analysis. I also have  
7 observed them, actually observed them, doing walk-throughs and  
8 talk-throughs. And if those are conducted properly, you can  
9 get a pretty good idea of what's going on in the job.

10           I guess what I'm saying, I'm going to be surprised  
11 if the new task analysis seriously modifies -- I'm sure there  
12 will be some modification, but I'm trying to say I think they  
13 had a pretty sound program which will be refined by this  
14 specific task analysis they have now developed.

END #2

15

Mary flws

16

17

18

19

20

21

22

23

24

25

Sim 3-1

1           A           (Witness Gardner) I would like to add just one  
2 more comment, and that has to do with the questions involving  
3 when the task analysis was completed.

4                   A task analysis is essentially never completed  
5 because it is constantly brought up to date as there are  
6 changes in the plant, as there are changes due to examination  
7 of the curriculum and instruction where improvements can take  
8 place.

9                   This would be reflected in the job and task  
10 analysis. So it has been and will continue to be an ongoing  
11 process.

12           Q           My question was really to determine whether,  
13 although it is an ongoing process, whether there was anything  
14 that the committee would have considered complete enough to  
15 review at the time of its review?

16           A           (Witness Uhrig) I think the answer to that is  
17 no.

18           A           (Witness Kimel) I don't find myself very often  
19 in a position where I disagree with my colleague. I would  
20 have to amplify again that the basis that I was looking  
21 at personally, and all of us were looking at is whether it  
22 is a performance based training program.

23                   There is more than one way to do that than the  
24 job task analysis formalism. Another one is behavioral  
25 learning objectives, through behavioral learning objectives.

Sim 3-2

1 And that is a methodology that Dr. Long and Dr. Kneif chose  
2 to use, kind of a pioneering effort, as I saw it, in the  
3 training effort of nuclear power plants, for which I think  
4 they should receive enormous credit.

5 Now that isn't the particular words that are  
6 used to describe the performance based training program  
7 methodology that INPO likes to see, job task analysis.

8 My point is that they are translating what they  
9 have done from the behavioral learning objectives technique,  
10 as it were, Dr. Gardner, to the job task analysis methodology,  
11 and that did not occur. The latter did not exist at the  
12 time of our May/June meeting. But I believe that is for  
13 the operator training program now complete.

14 Q Did the committee look at the process for trans-  
15 lating job task analysis data to behavioral learning objectives  
16 and examination questions?

17 A (Witness Gardner) Would you repeat the question?  
18 I want to make sure that I get all of the kind of things  
19 that are associated with it.

20 Q Okay. Well, why don't I do it in two parts.

21 Did the committee look at the process for trans-  
22 lating job task analysis data to behavioral learning  
23 objectives? I will stop there.

24 A As described by Dr. Kimel a few moments ago, one  
25 way of looking at what takes place in the control room in

Sim 3-3

1 terms of jobs and tasks is exactly determining what kind  
2 of behavioral objectives are important that be taught and  
3 also learned in order to operate the control room effectively.

4 So I guess I would see the question that you are  
5 asking as one where the problem could be viewed both from  
6 the point of view of behavioral learning objectives looking  
7 directly at the job in terms of translating those into  
8 behavioral learning objectives and the formalized job and  
9 task analysis, which, incidentally, has been taken over by  
10 INPO.

11 They have given it certain characteristics of  
12 their own and as is common with psychologists, there is  
13 a tendency for psychologists to exercise a certain proprietary  
14 right on certain developments and attach their own nomenclature  
15 and their vocabulary to it.

16 So I would say then that yes, that when looking  
17 at what takes place in the control room and looking at the  
18 behavioral learning objectives which are expressed in the  
19 manual that has been described before, operations manual,  
20 and looking at INPO's definition and using its way of  
21 describing job and task analysis, that these two things  
22 were considered.

23 A (Witness Christensen) May I add to that?

24 Q Certainly.

25 A I have got a little different connotation from

Sim 3-4

1 your question than Dr. Gardner did.

2 The process that was going to be used was  
3 described to us by Gaines and by others, and it included  
4 such things as not only were they going to develop behavioral  
5 learning objectives, but they were going to try to assess  
6 the best way to teach these things.

7 In other words, should it be taught on a simulator,  
8 should it be taught in a classroom lecture, what kind of a  
9 job age should be used and so on.

10 And, further, I was shown another matrix which  
11 tried to develop information as to whether the particular  
12 task was particularly a memory task or was it a decision-  
13 making task or what was it. Both of those things were  
14 explained to me as part of their process in developing BLO's  
15 from task analyses.

16 Q Then the second part of my question was did the  
17 Committee look at the process for translating job task  
18 analysis data to exam questions?

19 A Exam questions?

20 Q Exam questions.

21 A I was told that the exam questions would -- in  
22 making up an examination, they would then refer to these  
23 matrices I have explained to you, and you would try to  
24 get a balance in the examination of memory, decision-making  
25 and so on, yes. That is part of the process as it was

Sim 3-5

1 described to me.

2 A (Witness Gardner) Since Mr. Kelly and I  
3 examined the examinations, I think we would like to add  
4 something to that.

5 A (Witness Kelly) I believe when we reviewed  
6 the examinations we were looking at the scope and content  
7 of the examinations and particularly did it meet the  
8 objectives of the training program, and I would say yes,  
9 that we correlated the two.

10 Q On the top of page 11 of your rebuttal testimony,  
11 the first full sentence, it is stated that "The Committee  
12 has sampled lesson plans and handouts for those classes  
13 that members of the Committee attended."

14 What was the purpose of the sampling?

15 A The purpose of what?

16 Q The purpose of the sampling. It is stated at  
17 the top of page 11 that the Committee sampled lesson plans  
18 for the classes that the Committee members attended. Could  
19 you tell me the purpose?

20 A Yes. What we were interested in determining  
21 was, No. 1, the effectiveness of the instruction in the  
22 classrooms, and one very important variable is -- one very  
23 important variable is that when the instructor enters the  
24 classroom does the instructor have a specific plan in terms  
25 of what he hopes to achieve and does he have adequate means

Sim 3-6

1 and devices to execute those plans, does he use appropriate  
2 techniques, does he use the appropriate instruction skills  
3 that are necessary, does he summarize what he has attempted  
4 to do at the completion of the lecture to indicate whether  
5 or not he has achieved his purpose and, in particular, does  
6 the lesson plan give an opportunity for more than just  
7 lecture but for interaction between the trainees and the  
8 instructor, that is a back and forth question and answer  
9 type of approach.

10 And so it is important to look at the lesson  
11 plans in order to understand what the instructor plans to  
12 do and then follow through and see whether or not he has  
13 done it. I said he, but it happened that all the instructors  
14 in this particular case were males.

15 Q The statement is it was a sampling of lesson  
16 plans for the classes attended. Does that mean that you did  
17 not review a lesson plan for each of the classes?

18 A (Witness Kelly) No. In each class that Dr.  
19 Gardner and I attended, and Dr. Gardner was looking at the  
20 things he just addressed and I was looking at technical  
21 content, we had the lessons plans and handouts with us, all  
22 of them, for each classroom.

23 A (Witness Gardner) As a matter of fact, I have  
24 most of those home now. I didn't bring them with me to  
25 Harrisburg, but I could reproduce them.

Sim 3-7

1           Q       The way you have described what you did with  
2 the lesson plans, in view of sitting in on classes, it sounds  
3 somewhat like a quality assurance check or a form of quality  
4 assurance check. But I note in the sentence that follows  
5 the statement I just quoted, you said it is not a quality  
6 assurance check. Is it to some extent a quality assurance  
7 check?

8           A       I would like to answer that one because being  
9 a person again that is in a different field, I have been  
10 somewhat, I won't say puzzled, but at least it hasn't been  
11 clear in my mind how the utility should use the term "quality  
12 assurance."

13                   I have tried to pursue that some with my  
14 colleagues and with some of the staff from TMI, and I have  
15 come to the conclusion that what they define as quality  
16 assurance is to a large extent what we did. Perhaps the  
17 difference between quality assurance as defined by the  
18 utilities and what we did would be the extent to which we  
19 followed through in as complete and as systematic a way as  
20 an actual quality assurance check would do if that was the  
21 purpose of the group doing the particular examination.

22                   JUDGE SMITH: As I understood the term -- where  
23 in the testimony is it?

24                   MS. WAGNER: At the top of page 11. The first  
25 sentence says they sampled lesson plans and the second

Sim 3-8

1 sentence says this sampling was not a quality assurance check.

2 And I was wondering whether Dr. Gardner ---

3 JUDGE SMITH: And that was a reference back to  
4 the staff's testimony that the quality assurance would be  
5 necessary in their view, and I understood their testimony  
6 to be almost using quality assurance as corroboration and  
7 not necessarily all of the formalities that the NRC quality  
8 assurance programs might require, which are some 18 criteria  
9 of extremely formal requirements, and I understood it  
10 simply to be corroboration of validation.

11 end Sim  
12 Joe fols

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1           And if that is a correct inference, what would  
2 you have to say about your testimony?

3           A       (Witness Gardner) Judge Smith, I think that is  
4 exactly correct, and one of the reasons that I was -- let  
5 me put it this way -- that I was as careful as I was, because  
6 I didn't want to use the term, 'quality assurance.' In the  
7 first place, not be completely clear as to the exact definition  
8 of it, and if you like, not trying to claim that we did a lot  
9 more than we actually did do.

10           But we did do a number of things that, as Ms.  
11 Wagner has indicated here, would be the same kind of thing  
12 that would be done if we were doing a quality assurance check.

13           BY MS. WAGNER     (Continuing)

14           Q       Then when the Committee says the sampling was not  
15 a quality assurance check, am I correct that you were saying  
16 that -- you are using the words, 'quality assurance check'  
17 as referring to the kind of quality assurance check required  
18 by NRC regulations?

19           A       That is correct.

20           Q       But in your own mind, in your own sense, your  
21 own use of the words, it would be a form of quality assurance  
22 check?

23           A       Yes.

24           Q       Did you read the NRC Staff's testimony as stating  
25 that our witnesses believed you should do a quality assurance

1 check similar to that required by the regulations?

2 A That was my understanding. I don't know about  
3 the other members of the Committee.

4 Q Could I ask the other members the same question?

5 A (Witness Uhrig) I can respond. As far as I am  
6 concerned, the quality assurance program has many components  
7 to it, including a formal set of rigid rules that you set  
8 out ahead of time, and follow those precisely.

9 I have for about eleven years had the QA Department  
10 in our utility reporting to me, and we had a manual about  
11 yea thick that told people precisely what they did, and we  
12 have nothing comparable to that here.

13 On the other hand, we did do a lot of checking  
14 of the kind that Dr. Gardner described here.

15 Q Judge Smith, I skipped around somewhat on my  
16 cross examination plan which I gave you earlier, but I am  
17 at my last topic now. I just wanted to ask the Committee  
18 a few questions on the subject of their statement of on the  
19 job training which appears again at the top of Page 11 of  
20 their rebuttal testimony.

21 On the third line --

22 A (Witness Gardner) What page was that again?

23 Q Page 11. It is the same page we were just focusing  
24 on. In fact, the next sentence after quality assurance check.  
25 Beginning on line 3. The Committee also has reviewed the

1 ATOG procedures, has reviewed the process used by Licensee for  
2 on the job training, and has observed a sample of simulator  
3 training, B&W and BPTS.

4 I would like to get a fuller understanding of your  
5 review of the process used by Licensee. Could someone  
6 summarize for on the job training?

7 A (Witness Kelly) For on the job training?

8 Q Yes, that is right.

9 A The process I used was to discuss the process with  
10 the training management at TMI, and also with the operators  
11 during interviews just exactly how they did their on the  
12 job training.

13 I asked what type of check lists were involved  
14 and reviewed these, but I was also very much interested in  
15 how the operators were working on the shifts once they were  
16 licensed, participating in the heat ups and cool downs at the  
17 stations, performing surveillance checks. This is the  
18 methodology.

19 Q Did you observe any on the job training?

20 A No, I did not.

21 Q Did any Committee members observe any on the job  
22 training.

23 A (Simultaneously) I did not.

24 Q Did you look at any of the documentation for on  
25 the job training, such as check lists, qual cards?

1 A I looked at a few samplings of that, yes.

2 Q Did the Committee review any evaluations of on  
3 the job training?

4 A (Simultaneously) I did not.

5 Q Do you know whether any written evaluations of  
6 on the job performance exist?

7 A (Witness Kelly) I assume by viewing the check lists  
8 that are supposed to be filled out by shift supervision, that  
9 there are documents that do test the fact that the operators  
10 have completed that particular portion of the training.  
11 Although I have not seen any.

12 Q This is to any committee member. Do you have an  
13 understanding of how on the job performance is fed back into  
14 the training program? Is this an area that was looked into?

15 A Well, during the performance of the on the job  
16 training, as they complete the check list or participate in  
17 particular types of training, they are evaluated by shift  
18 supervision

19 Q What I am really talking about is on the job  
20 performance now. Not on the job training.

21 A I am sorry. That is what I was referring to, on  
22 the job performance is evaluated by shift supervision.

23 Q But you did not review any documentation of that?

24 A The actual evaluation, no.

25 A (Witness Christensen) Ms. Wagner, I am not sure

1 I completely understood the question, but I think it should  
2 be mentioned that there are periodic meetings between  
3 operational people, between training and education people  
4 and so on, and it is my understanding that the operations  
5 people have an opportunity to review examinations, review  
6 license plans, and things like that, and make direct input  
7 into them.

8 I would think on the job performance would be  
9 reflected in those inputs that are made by the operations  
10 people to the training and education people. Is that  
11 responsive to what you were --

12 MR. JORDAN: I need to object, and move to strike  
13 what Dr. Christensen has just said. The question I believe  
14 was one of methodology, and there was a foundation question  
15 that I observed to Mr. Kelly that went beyond methodology,  
16 and then the question went as to whether he reviewed that,  
17 and that was okay.

18 What Doctor Christensen has just addressed is not  
19 what the Committee did to look at something, but what his  
20 understanding is of the substance, or what was actually done  
21 at the Island, which is not methodology, and therefore, not  
22 appropriate rebuttal, and not appropriate response to this  
23 cross.

24 MS. BAUSER: Judge Smith --

25 JUDGE SMITH: I am eager to see how --

1 MS. WAGNER: It is possible that he is technically  
2 correct.

3 JUDGE SMITH: That is exactly the way Ms. Bauser  
4 feels.

5 (Laughter)

6 MS. WAGNER: It is quite possible. But on the  
7 other hand, I guess I am somewhat struck by the irony of  
8 having the Committee before us and, in fact, having the proceed-  
9 ing remanded to hear their views, and not being able to hear  
10 their view on something.

11 So, I think I agree that it does go beyond  
12 methodology.

13 So, I am in a quandry, I suppose. I would like  
14 to hear the answer to the question. That is why I asked it.

15 JUDGE SMITH: The question has been answered,  
16 hasn't it?

17 MS. WAGNER: Excuse me, that is correct.

18 MR. JORDAN: I couldn't know what an answer was  
19 going to be. I had to move to strike rather than -- I wasn't  
20 objecting to the question, but to an answer that had,  
21 essentially, necessarily slipped by me.

22 JUDGE SMITH: We have had so much testimony from  
23 Mr. Ross and the panel from the Island out there on this  
24 subject, that this whole exchange is harmless, and I just don't  
25 think it hurts anything. I don't like to strike because it

1 is not a precise -- it is not precise. I don't know -- not  
2 hearing, I don't know what part of the question would fall  
3 within talking about the actual substance of the feedback, or  
4 the observation part.

5 MR. JORDAN: Fortunately in this case it was -- I  
6 was concerned about that myself as I was looking down the road  
7 to see what we might get. In this case there was a clear  
8 distinction.

9 Mr. Kelly spoke about something, and then Dr.  
10 Christensen spoke. Everything Dr. Christensen spoke is  
11 subject to the Motion.

12 JUDGE SMITH: I don't question that you may be  
13 right, but when I was listening -- I mean I did not listen  
14 to it with that in mind, so I have to depend upon memory.  
15 I think you have all of the relief that you need. If it  
16 turns out as you asserted, and I don't have any reason to not  
17 believe you, that a question is all tainted -- well, it just  
18 can't be used for findings for that point.

19 MR. JORDAN: If it is limited in that way, I don't  
20 have a problem.

21 JUDGE SMITH: I mean for the truths of the  
22 substantive method.

23 I might say that the point that you are raising  
24 is one of the questions that I have for the panel when it  
25 returns. That is one of the few questions that I have, so it

1 is a moot point.

2 MR. JORDAN: I suppose it is as objectionable when  
3 you ask it, as it was when she asked it.

4 JUDGE SMITH: I don't think so. I am talking about  
5 the Ross/Newton/Leonard panel.

6 MR. JORDAN: Oh, that is a different panel.

7 JUDGE SMITH: Yes.

8 BY MS. WAGNER: (Continuing)

9 Q Dr. Christensen, as you are probably aware,  
10 there is testimony by other witnesses as to periodic meetings,  
11 the same kind of meetings to which you yourself referred. What  
12 is your basis for believing that feedback does occur in these  
13 meetings?

14 MR. JORDAN: I object. I thought the question was  
15 what was their methodology for determining what their basis  
16 would be for beliefs.

17 MS. WAGNER: I am trying to find out -- if he tells  
18 me his basis, I believe he will be telling me what he looked  
19 at\*what information he reviewed.

20 MR. JORDAN: The question is what did you do to  
21 examine the periodic meetings, or whatever the substance is,  
22 and to reach whatever determination you reached?

23 JUDGE SMITH: That is a good question. Why don't  
24 we put that to him.

25 MS. WAGNER: I don't have any problem with that

1 question.

2 JUDGE SMITH: All right. Do you understand the  
3 question?

4 WITNESS CHRISTENSEN: I would beg that it be  
5 repeated, please. To be sure that I understand it.

6 (Reporter reads question back)

7 WITNESS CHRISTENSEN: I did not examine results  
8 of the meetings to which I referred. This procedure -- and  
9 I am a little confused what we mean by methods here, but I  
10 would call a method, method described to us in our briefings  
11 of the pains that were taken to be sure that all who had  
12 a legitimate input into examinations and training procedures  
13 and so on would have that.

14 That was part of the initial briefings -- no, I  
15 believe they were the briefings at Parsippany in June, when  
16 we first heard about this. And exactly who gave that part  
17 of the briefing, I do not remember.

18 MR. JORDAN: It appeared to me from the witness'  
19 statement that he had some confusion as to what methodology  
20 you were talking about.

21 JUDGE SMITH: I don't think so. He identified  
22 it. Briefings.

23 MR. JORDAN: Well, the question here is not the  
24 methodology used by the -- yes, he did say the methodology  
25 the Committee used was the briefing, but I was concerned he

1 indicated to me some feeling that he was to talk about the  
2 methodology used by the Company in its operation. And that  
3 is not the methodology we are talking about. That is just  
4 to help as we go through and minimize the problems we might  
5 have.

6 JUDGE SMITH: You see, you are always going to  
7 run into the interface between methodology the Committee used,  
8 and the substance of what they observed in their methodology,  
9 and they sometimes cross over.

10 But as I understand his answer, that he -- the  
11 method used by the Committee was to be briefed by the Company  
12 on the job performance feedback.

13 MR. JORDAN: Right. And the testimony to the  
14 method used by the Committee is fine testimony.

15 MS. WAGNER: I have no further questions for  
16 these witnesses.

17 MR. AU: Judge Smith, I may have spoken too  
18 quickly when I said I didn't have any questions. I do have  
19 one factual question when can be cleared up very quickly.

20 JUDGE SMITH: Sure.

21 End 4.  
22 SueT fols.

#5-1-SueT

## CROSS EXAMINATION

2

BY MR. AU:

INDEXX

3

Q Dr. Uhrig, on the bottom of Page 7 of your

4

rebuttal testimony, you state that the Committee also reviewed

5

and placed reliance on GPUN's memorandum responding to the

6

RHR Report.

7

A (Witness Uhrig) I'm sorry, I don't --

8

Q The last sentence.

9

A Yes.

10

Q What is the date of that GPUN memorandum on

11

which you placed reliance?

12

A I don't know. Does anyone know the date of

13

that? The last sentence on Page 7.

14

(Witness Gardner) I don't know the date, but

15

I was referring to that earlier when I said that I was

16

familiar with GPUN's response to the RHR Report. I don't

17

recall the exact date. I do not recall the exact date, but

18

that's the document that I said that I had seen and reviewed

19

at the same time I looked at the RHR Report.

20

Q Okay. And that document was reviewed by you

21

prior to preparing your prefiled testimony November 1st?

22

A Yes.

23

Q I'm going to show you Licensee Training Exhibit

24

Number 1 which has been admitted in evidence, and I am going

25

to ask you if that is the document which you placed reliance

#5-2-SueT 1 on.

2 (Mr. Au hands to the witness a document.)

3 A This document looks very similar to the one that  
4 I observed. But according to the date on this I don't see  
5 how it could have been. This is dated December the 21st.

6 But the content of this, as I skim it, looks  
7 very similar to the one that I examined.

8 Q Okay. So you couldn't have placed -- you have  
9 not seen Licensee Exhibit Number 1 before; is that correct?  
10 That exact document?

11 A That is correct, this document.

12 Q So you did not place reliance on that exact  
13 document?

14 A Say that one again.

15 Q You did not place reliance on that document?

16 A Not on this particular document.

17 Q So it was possibly an earlier document?

18 A That would be my belief. I don't know that.

19 (Witness Kelly) This looks --

20 Q Mr. Kelly?

21 A I received and reviewed this as well as the  
22 document that we were discussing earlier, which I don't  
23 remember the date, but it was well in time to review before  
24 our testimony. This is an update.

25 At that time of the earlier document, all of the

#5-3-SueT 1 issues in the RHR Report had been addressed satisfactorily  
2 to us.

3 Q So, your testimony is you placed reliance to  
4 an --

5 A That's right.

6 Q -- earlier version of that document?

7 A That is correct.

8 (Witness Gardner) That is correct, because I  
9 have not seen this one.

10 MR. AU: I have no further questions.

11 JUDGE SMITH: Do you have redirect?

12 MS. BAUSER: Yes. But I would appreciate --  
13 could I have a break please, Judge Smith, for a minute?

14 JUDGE SMITH: Certainly.

15 MS. BAUSER: Five minutes?

16 JUDGE SMITH: We might as well take our mid-  
17 morning break.

18 (Whereupon, the hearing is recessed at 10:04 a.m.,  
19 to reconvene at 10:17 a.m., this same date.)

20 JUDGE SMITH: Ms. Bauser.

21 REDIRECT EXAMINATION

22 BY MS. BAUSER:

INDEXXX 23 Q Dr. Gardner, Mr. Jordan asked you whether the  
24 model of Dr. Regan's that you were referring to on Page 14  
25 of your testimony was the IQI model, and I believe you answered

#5-4-SueT

1 that question affirmatively. Is that the testimony?

2 A (Witness Gardner) I'm sorry. I was confused at  
3 that point and misspoke.

4 These various symbols and groups of letters and  
5 so on I find hard to differentiate since I am not familiar  
6 with this field. The IQI was one portion of what Mr. Regan  
7 was talking about, Dr. Regan, but actually it was only a  
8 small portion of it. And what I was referring to, which I  
9 reviewed in great detail, was the -- and I can't recall these  
10 symbols either, it's ISD or something of that kind, or SAT,  
11 or a whole series of those things.

12 Whatever they are, it was the overall model that  
13 he had suggested of which IQI was one portion of it, one  
14 aspect.

15 Q Dr. Gardner, the NRC Staff pointed out in its  
16 cross-examination several actions that the Committee did not --  
17 several methods that the Committee did not use in conducting  
18 its review of the TMI-1 licensed operator training program.

19 I would like to ask you what effect you believe  
20 not using those methodologies that were recommended by the  
21 Staff had on the results that the Committee found?

22 A I would like to comment on and address directly  
23 this issue of methodology, because that has come up constantly.

24 In answer to your specific question, I would say  
25 that it did not have an effect, that we did not lose by not

#5-5-SueT 1 using those particular methodologies. As a matter of fact,  
2 in courses on evaluation to doctoral students one of the  
3 points that I've tried to make in the past is that the  
4 approach in real life to doing an evaluation is to avoid  
5 selecting from the textbook a particular model or even select-  
6 ing the model that may be a favorite of the instructor, but  
7 to examine the questions of concern, to look at the resources  
8 that are available. This would be personnel, both numbers  
9 and quality, time and other resources, money, and that the  
10 plan that is devised should attempt to use those resources  
11 to maximize the information that is needed to arrive at ap-  
12 propriate answers to the questions that have been raised.

13 Our approach -- that is the approach of the  
14 Committee, its methodology -- I would be willing to defend as  
15 completely appropriate. It actually took place within two  
16 time frames. The first time frame involved certain activities  
17 resulting in the Special Report. The data that we relied upon  
18 at that point did involve documents that we studied. It  
19 involved interviews and briefings by management.

20 But those briefings, which we've used this term  
21 rather constantly, were far more than just briefings. We  
22 spent considerable time with followup questions, with getting  
23 information from a number of people in management, and found  
24 consistent results there.

25 We also had one unusual situation here. There was

#5-6-SueT

1 one set of data that was really unique in this particular  
2 situation which we felt could be used to advantage. And  
3 that was the self-evaluation document that had been prepared  
4 for INPO for accreditation. I'm not at all concerned about --  
5 or wasn't at that time -- whether it was for INPO but as part  
6 of the usual accreditation process which takes place both in  
7 academia and in assessing most training programs.

8           And this process involves, first of all, a self-  
9 evaluation which describes the program of the academic institu-  
10 tion or the utility in great detail, describes the procedures,  
11 goes into very great detail on resources. This type of docu-  
12 ment is then submitted to the accrediting agency which examines  
13 the document very carefully. It then sends a visiting team to  
14 site-visit the organization and to do a very detailed quality  
15 assessment and see whether or not what is in that document is  
16 correct.

17           The worse thing that can happen to either a  
18 psychology department seeking accreditation or a college  
19 seeking accreditation or an industrial training program seeking  
20 accreditation is to have material in that self-evaluation which  
21 cannot be confirmed by the site-visiting team. Therefore, I  
22 felt that we had one set of documents here that warranted much  
23 higher credibility, not only higher credibility but assurance  
24 that what was described there was actually being followed with-  
25 in the training program. That's the first phase.

#5-7-SueT 1           The second phase where we had an increase both  
2 in time and in personnel involved collecting data that we  
3 observed firsthand, and those data which were summarized in  
4 our testimony confirmed what we had previously presented in  
5 our report.

6           MS. BAUSER: I have no more questions.

7           JUDGE SMITH: Mr. Jordan?

8           MR. JORDAN: I have no questions.

9           JUDGE SMITH: Mr. Au?

10          MR. AU: I have no questions.

11          MS. WAGNER: I may have a question.

12          (Pause.)

13                           REXCROSS EXAMINATION

14          BY MS. WAGNER:

INDEXX 15           Q       The first point is one of clarification. You  
16 may have already testified to this, but did the Committee  
17 rely on the self-evaluation report in preparation of its  
18 June 12th report?

19           A       (Witness Gardner) The answer to that is, yes,  
20 because one of the activities in which I engaged during the  
21 May/June period was a long conference with Dr. Knief, who  
22 I believe at that time had the responsibility for preparing  
23 the material to be submitted to INPO. I am not certain, but  
24 I believe at that time it had not been submitted, or it was  
25 about ready to be.

#5-8-SueT

1 But he supplied me with those documents which  
2 I took home with me.

3 (Witness Uhrig) Let me add to that. Reference 18  
4 in our Special Report is a memorandum of May 24, 1984, INPO  
5 Self-Evaluation Report. And this is the document that was  
6 given to us in the May/June time frame.

7 Q The document, Document Number 18 --

8 A Yes.

9 Q -- I believe the description described the  
10 memorandum, but you were saying that attached to that memoran-  
11 dum --

12 A I don't know whether it was the memorandum, but  
13 it did -- it included the report. Whether the memorandum was  
14 the report or whether it was attached to the memorandum, I  
15 don't recall. But the essence of the self-evaluation report  
16 was given to us at that time.

17 Q You said it included the report. Do you recall  
18 whether it included the entire report, or was it rather a  
19 summary of the report that was attached to the memorandum  
20 you referenced?

21 A As I recall it, it was an early draft of -- a  
22 semi-final draft of what was going to INPO. It contained  
23 the detailed material.

24 Q Could you tell me, could you approximate how  
25 large a document this was in terms of inches, then?

#5-9-SueT

1 A (Witness Gardner) Yes. It did consist of  
2 two parts. I had material which would be about that size.

3 (The witness is demonstrating with his hands.)

4 Q About four or five inches?

5 A About four or five inches. I'm sorry. I guess  
6 she can't record that.

7 (Laughter.)

8 But Dr. Knief also showed me a series of boxes  
9 that had additional material. I obviously didn't read all  
10 the material in those boxes but I did sample it. I did look  
11 at some of it.

12 (Witness Uhrig) It was the smaller document that  
13 I had access to. I did not have access to the large amount.

14 (Witness Gardner) You assigned that job to me,  
15 Bob.

16 (Laughter.)

17 Q Dr. Gardner, in response to a question by your  
18 counsel you said that it would not be appropriate to use a  
19 textbook methodology --

20 A No. No.

21 Q -- in the situation -- no?

22 A I didn't say that. At least, I hope I didn't.

23 Q Oh, I'm sorry.

24 A What I said was that in a course of this kind  
25 where people, after they obtained their PhDs. go out and do

#5-10-SueT 1 evaluations, is that they should not rely on textbook models  
2 or textbook methodology. In many cases, it can be that there  
3 will be a particular model that will fit a particular situation.

4 But one of the dangers if you are presenting a  
5 series of models of various types is that the person that is  
6 leaving and going out on the job will restrict themselves to  
7 just those models with which they are familiar, and that is  
8 not the way that you approach a task of this kind to make  
9 the maximum use of your resources and to come up with the  
10 very best results.

11 Q Do you believe the methodology proposed by the  
12 Staff in its testimony was tailored to the task at hand?

13 A I'm sorry.

14 Q Do you believe that the methodology proposed  
15 by the Staff in its testimony was tailored to this task at  
16 hand, in contrast to something out of a textbook?

17 A It's hard for me to answer that question. I  
18 would say that the methodology proposed by the Staff would  
19 be one that they had used successfully in a number of situa-  
20 tions.

21 I would say that most of the suggestions in the  
22 Staff description of their methodology and the kinds of data  
23 that the Staff indicated it would collect was collected by  
24 the Committee. I would be most unwilling to say that any  
25 particular methodology was inappropriate, period, or might not



Sim 6-1

1 MS. WAGNER: Thank you, gentlemen.

2 I have no further questions.

3 JUDGE SMITH: Any further questions?

4 MR. JORDAN: Not from us.

5 JUDGE SMITH: All right, gentlemen, you are  
6 excused and thank you.

7 MR. JORDAN: Oh, I am sorry. Not from us on  
8 that particular rebuttal testimony. We did have a correction  
9 that we wanted to make that is most easily done at this  
10 point.

11 MS. BAUSER: Go ahead. I think Dr. Uhrig is aware  
12 of your correction.

13 WITNESS UHRIG: Do you have the page?

14 MR. JORDAN: I am referring to page 31,817 of  
15 the transcript for Wednesday, December 19th, 1984.

16 Are you with me, Dr. Uhrig?

17 WITNESS UHRIG: Yes.

18 MR. JORDAN: The question and answer that I am  
19 concerned with appears on line 11 through 15 and I will just  
20 go ahead and read it.

21 The question was "It is correct, is it not,  
22 before issuance of the Special Report, Dr. Uhrig, did you  
23 do anything to check the accuracy and consistency of the  
24 curriculum materials and examinations against the actual  
25 design of the reactor?"

Sim 6-2

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

The answer was "That is correct."

I believe the problem is that is not an answer to that question.

(Laughter.)

WITNESS UHRIG: It depends on which half of your question you are talking about.

(Laughter.)

MR. JORDAN: I certainly intended to state it as You did not do anything to check the accuracy and consistency of the curriculum materials and examinations against the actual design of the reactor? Is that what you were intending to answer?

WITNESS UHRIG: That answer that I apparently intended to give at that time was No. We have subsequently of course talked about the operations plant manual and those corrections. But the answer that I intended to give is as you said, no.

MR. JORDAN: So your answer to the question as it appears in the text is no.

WITNESS UHRIG: As it appears in the text, no.

MR. JORDAN: That would be all, Your Honor.

JUDGE SMITH: You are excused. Thank you.

(Panel excused.)

MS. BAUSER: Judge Smith, could we just have two minutes, please?

Sim 6-3

1 JUDGE SMITH: All right.

2 (Brief recess.)

3 JUDGE SMITH: Do you wish to be heard, Mr. Au?

4 MR. AU: Yes. For the record, I have just  
5 handed out to the parties and to the Judges the Commonwealth  
6 of Pennsylvania's motion to disqualify Administrative Law  
7 Judge Ivan Smith.

8 With me today is Mr. Thomas Rees, who is  
9 Deputy General Counsel of the Governor's Office of General  
10 Counsel.

11 MR. REES: Thank you, Mr. Au.

12 If the Board, please, I am here today as  
13 a representative of the Governor's Office and the Commonwealth  
14 because of a serious concern on our behalf about Judge Smith's  
15 statements in this case, both extrajudicially and in the  
16 handling of remanded hearings.

17 JUDGE SMITH: Just a moment. You are a counsel?

18 MR. REES: Yes.

19 JUDGE SMITH: For the Attorney General?

20 MR. REES: I am Deputy General Counsel in the  
21 Governor's Office.

22 JUDGE SMITH: All right. Have you filed a  
23 notice of appearance in this hearing?

24 MR. REES: I am filing a notice of appearance  
25 today, Your Honor.

Sim 6-4

1 JUDGE SMITH: All right. We will give you a  
2 courtesy opportunity to appear until you do that.

3 MR. REES: Thank you.

4 JUDGE SMITH: Now what is the purpose of your  
5 remarks?

6 MR. REES: I am going to outline very generally  
7 the grounds that we have stated in our motion to disqualify.

8 JUDGE SMITH: Our rules provide that motions  
9 be in writing. Is there anything you are going to say in  
10 addition to the motion?

11 MR. REES: The motion is made in writing and  
12 I believe that it would be helpful at this time to have a  
13 statement as to the grounds that are stated in the motion.

14 JUDGE SMITH: No, sorry. We don't want to  
15 hear from you.

16 MR. REES: Thank you very much.

17 JUDGE SMITH: You have to make the entire  
18 presentation in writing. I am sorry to put you to the  
19 inconvenience to come here, but that is not just my preference,  
20 but that is the standard that has been set up in the NRC  
21 for motions to disqualify, that they be in writing and that  
22 the parties have an opportunity to respond to them.

23 MR. REES: Well, the grounds are fully stated  
24 in the motion in writing, but I will take exception to your  
25 ruling.

Sim 6-5

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

JUDGE SMITH: All right.

You may proceed.

MR. AU: Before we proceed ---

JUDGE SMITH: Excuse me, Mr. Au.

MR. AU: --- let me also state for the record that I am transmitting copies of the motion by mail today to the service list.

JUDGE SMITH: All right. Thank you.

And we appreciate the courtesy copies which you provided.

MS. BAUSER: Judge Smith, licensee has called to the witness stand Dr. Ronald Knief and Mr. Bruce Leonard. Dr. Knief was sworn during the previous proceedings and Mr. Leonard has already testified in the proceedings this year.

Whereupon,

RONALD A. KNIEF

- and -

BRUCE P. LEONARD

were called as witnesses by the Licensee and, having been previously duly sworn, were further examined and testified as follows:

DIRECT EXAMINATION

BY MS. BAUSER:

Q Gentlemen, could you please state your name,

Sim 6-6 1 position and place of employment?

2 A (Witness Knief) Ronald A. Knief, currently  
3 Manager of Special Products, TMI-2 Programmatic Safety  
4 Overview Committee, GPU Nuclear Corporation.

5 A (Witness Leonard) Bruce Leonard, Operator  
6 Training Manager, Three Mile Island.

7 Q Gentlemen, I draw your attention to a document  
8 dated November 28, 1984 and entitled "Rebuttal Testimony of  
9 Dr. Ronald A. Knief and Mr. Bruce P. Leonard," consisting  
10 of 13 pages and two attachments.  
11

12 Dr. Knief, does this testimony represent the  
13 testimony prepared by you and Mr. Leonard for this proceeding?

14 A (Witness Knief) Yes, it does.

15 Q Gentlemen, I understand there are not corrections  
16 to make to the testimony; is that correct?

17 A That is correct.

18 Q Dr. Knief, is this testimony true and correct  
19 to the best of your knowledge and belief?

20 A It is.

21 Q Mr. Leonard, I would ask you if this testimony  
22 is true and correct to the best of your knowledge and belief?

23 A (Witness Leonard) Yes, ma'am, it is.

24 MS. BAUSER: Mr. Chairman, I move that the  
25 rebuttal testimony of Dr. Ronald A. Knief and Mr. Bruce P.

Leonard be admitted into evidence and be physically incorp  
into the record as if read.

JUDGE SMITH: Are there any objections?

MR. JORDAN: No objection.

JUDGE SMITH: The testimony is received.  
(The testimony of Messrs. Leonard and Knief

follows:)

INDEX

- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21

Sim 6-7

1 Leonard be admitted into evidence and be physically incorporated  
2 into the record as if read.

3 JUDGE SMITH: Are there any objections?

4 MR. JORDAN: No objection.

5 JUDGE SMITH: The testimony is received.

6 (The testimony of Messrs. Leonard and Knief

INDEX

7 follows:)

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

November 28, 1984

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
METROPOLITAN EDISON COMPANY	)	Docket No. 50-289 SP
	)	(Restart-Management Remand)
(Three Mile Island Nuclear	)	
Station, Unit No. 1)	)	

REBUTTAL TESTIMONY OF  
DR. RONALD A. KNIEF AND MR. BRUCE P. LEONARD

Q.1. Have you, Dr. Knief and Mr. Leonard, read the prefiled testimony of Dr. James J. Regan submitted on behalf of UCS on November 15, 1984 in this proceeding?

A.1. Yes, we have read Dr. Regan's prefiled testimony.

Q.2. Is this testimony responsive to Dr. Regan's testimony?

A.2. Yes.

Q.3. Why are you filing this response?

A.3. We believe it is important to respond to Dr. Regan's testimony because we believe Dr. Regan is unaware of the considerable efforts by GPU Nuclear in the past four and a half years to establish the validity of the TMI-1 licensed operator training program.

Dr. Regan's familiarity with our program apparently is limited to about seven days' exposure to the facts associated with it. See Regan Testimony at 1. Moreover, as Dr. Regan stated in his deposition, he did not know enough about the specific tasks associated with the job of control room operator to apply his personnel performance system to Three Mile Island. Regan Deposition of November 13, 1984, at 157, 159, 168. He therefore did not answer the question, "Is the instruction adequate to prepare the operators to operate the plant safely?" Regan Deposition at 168, referring to ALAB-772. Instead, Dr. Regan's testimony describes the system he would use to validate the program.

We do not fundamentally disagree with the principles articulated by Dr. Regan. In fact, the purpose of this testimony is to demonstrate GPU Nuclear's efforts over the past four and a half years to validate operator training, as Dr. Regan advocates in his testimony.

Q.4. Why is this testimony sponsored by the two of you (Dr. Knief and Mr. Leonard)?

A.4. Each of us contributes a slightly different perspective on and useful information related to the issue of the validity of the TMI-1 licensed operator training program. Dr. Knief was Manager, Plant Training, TMI from mid-1980 to mid-1983 and Manager of Educational Development for a year thereafter. He therefore has an historic perspective on the development of the program. As well, Dr. Knief approaches the

issue with a strong background in university and professional industrial education. Mr. Leonard, whose credentials have been previously described, is a member of this panel because of his detailed familiarity with the current licensed operator training program, including the job/task analyses for the TMI-1 RO and SRO that is underway. Together, we can best respond to Dr. Regan's views. Our qualification statements are attached to this testimony.

Q.5. Describe the validation methods applied by GPU Nuclear to the TMI-1 licensed operator training program.

A.5. To answer this question, it is necessary to provide some historical perspective. As Dr. Regan pointed out in his deposition, relating the content of training to the characteristics of a job "isn't done all that often." Regan Deposition at 144. In Dr. Regan's view, "there ought to be some attempt to recognize the dramatic advances in educational technology that are and have taken place in the last five to ten years." Regan Deposition at 144. Incorporation of these advancements does not ensure that a training program is good. See Regan Deposition at 148-49. Nevertheless, a contemporary vocational training program should have some content validation and, as well, use modern technology, e.g., using computers to manage the training process and to instruct, using feedback mechanisms. See Regan Deposition at 144-47. GPU Nuclear has endeavored to accomplish these goals and others, as the licensed operator training program has evolved over the last four and a half years.

The operator accelerated retraining program (OARP), developed in the aftermath of the TMI-2 accident, was designed and conducted in a manner then typical of the nuclear industry and academia -- it was a traditional, knowledge-based program which emphasized subject-matter topics and prior knowledge of the instructors. As a traditional program, it was diverse and thorough. However, it was not correlated with specific job performance requirements.

In mid-1980, the Training and Education Department of GPU Nuclear was formed, with Dr. Long as Director and Dr. Knief as Manager of Plant Training at TMI. Dr. Long and Dr. Knief were familiar with concepts of validation, and took immediate steps to shift the focus of operator training to a performance basis. Program validity was sought in terms both of subject-matter content and job performance. Information in both areas developed in-house was compared to that available from external sources such as INPO and the NRC. Systematic training development using feedback from a variety of cognizant personnel increased content and performance validity.

Q.6. What method did GPU Nuclear use to improve the validity of its TMI-1 licensed operator training program?

A.6. Instructor training, which started in 1980, placed special emphasis on the development and use of behavioral learning objectives. In addition, instructors were introduced to the principles of training needs analysis, job and task analysis, and testing and evaluation -- topics which were

later formalized as key elements in GPU Nuclear's and INPO's training system development (TSD) models and the NRC's systematic approach to training (SAT). Subsequent revisions to the replacement and requalification operator training programs incorporated these principles.

Q.7. Do you have a model that can be used to evaluate the development of training at TMI?

A.7. Yes. The TSD model is a method to develop a performance-based training program.

The TSD model includes five basic elements -- analysis, design, development, implementation, and evaluation. In summary, the TSD model recommends that a new training activity be constructed using the following steps: (1) Front-end analyses first identify the nature and extent of the training needs and then identify the elements of the job and tasks of which the job is composed. (2) The design phase focuses on developing behavioral learning objectives and job performance measures which correspond to the tasks required to perform the job. (3) The development component is primarily involved with developing curricula, training strategies, and lesson plans and other materials. (4) Implementation includes the actual scheduling and delivery of the training to the subject audience. (5) Although evaluation is listed as the final step of the TSD process, and indeed in its summative form can be a final wrap-up exercise, formative (in-line) evaluations should be conducted during and between each of the other steps to assess consistency and

provide for in-line feedback to modify and improve the resulting training program.

When a TSD approach is applied to an existing training program, in contrast to a new program under development, the initial focus is logically on the evaluation step. Strengths and weaknesses should be identified with the latter becoming the primary focus of attention and resources.

Q.8. How was the TSD approach applied at TMI?

A.8. Beginning in 1980, application of these principles to the licensed operator training programs at TMI-1 showed that the development and implementation phases were already conducted effectively. In our view, however, analysis, design, and evaluation could benefit from additional attention to assure proper focus on job performance. It was to these matters that our attention turned. Use of the TSD model was formalized in 1983.

The transition to performance-based training at TMI began through emphasis on behavioral learning objectives. These objectives identify not only subject areas required, but skills or cognitive behaviors to be mastered. See Regan Testimony at 6. The behavioral learning objectives for the licensed operator were developed or revised by job incumbents or other subject matter experts. This approach included an inherent element of informal or "table-top" job/task analysis.

Q.9. Did the use of behavioral learning objectives affect the performance evaluation process?

A.9. Evaluation in a performance-based setting is based on matching test items directly to the behavioral learning objectives. Focus on objectives paid the immediate dividend of allowing progress to be made simultaneously on three of the phases of the TSD model (analysis, design, and evaluation).

Q.10. How did you ensure that instructors unfamiliar with the use of behavioral learning objectives properly utilized them in the classes they taught?

A.10. Instructors and supervisors were trained on writing and use of behavioral learning objectives as a means of focusing instructional and student attention on training performance requirements and of communicating program content to Operations management personnel for their added input and ultimate concurrence. Instructor training courses, given routinely, continue the process of educating instructors in the performance-based methods utilized at TMI. In addition, when the program was instituted, the Manager of Plant Training worked with Training staff on improving the quality of the behavioral learning objectives through instructor classroom evaluations and review of selected lesson plans.

Q.11. Did the validation process used at TMI evolve further in the 1980 to 1982 time-frame?

A.11. With the issuance of NUREG/CR-1750, "Analysis, Conclusions, and Recommendations Concerning Operator Licensing" (January 1981), generic job analysis information for the licensed-operator job was available for the first time. GPU

Nuclear reviewed this document carefully. It was used to assess the content of the TMI-1 licensed operator training program. It also was used to assess new qualification cards developed to support on-the-job training activities.

INPO Guidelines (initially christened "benchmarks of excellence") for licensed operator training also were issued in this time-frame. Comparison of their subject matter to that of the TMI-1 program showed substantial agreement and content validity. The two programs also matched in terms of administrative requirements, such as the types of evaluations and review and approval mechanisms, which enhance performance validity.

In addition, in 1980 GPU Nuclear instituted a program of evaluation of simulator training by management. Due to their inherent integration of the entire range of job-performance skills, simulator drills and evolutions have been especially important evaluation methods providing feedback to both the training and operational arenas. They are also important mechanisms in performance validation.

In addition, in 1982 the formal process for operator certification as ready to operate the plant was established to consist of an integration of several training-related performances--classroom quizzes and examinations, on-the-job qualification, simulator and plant drills, and final written and oral examinations. Assistance was provided to instructors for their roles in these activities through a workshop on testing and evaluation. Based initially on consultation by Dr.

Eric Gardner with the TMI Training Department, the workshop provided some specific guidance on construction and use of a variety of written and oral examination methods. During the workshop, the instructors developed a TMI-specific taxonomy of cognitive skills against which existing quizzes and examinations were compared to assess relative balance between memorization and higher order mental processes, such as problem solving and decision-making. This training provided background for developing test specifications for annual requalification examinations.

Q.12. When did the INPO industry-wide job/task analysis effort begin and what was GPU Nuclear's involvement in that effort?

A.12. In 1981, INPO began its industry-wide job/task analysis project. TMI-1 supported the effort by having licensed operators complete surveys and participate in validation exercises conducted at INPO headquarters in Atlanta. Educational technologists from both the TMI and Oyster Creek Training Departments participated in workshop sessions at INPO to become trained on the process in support of plant-specific validation of the job/task lists.

Q.13. Have the INPO guidelines for accreditation been utilized at TMI?

A.13. INPO's 1982 draft guidelines for accreditation of nuclear power plant training programs were reviewed by Training and Education Department management and educational

technologist personnel in terms of consistency with the TMI-1 licensed operator training program. GPU Nuclear contracted with Data Design Laboratories (DDL) to perform an extensive evaluation of these programs using the draft INPO criteria as a basis. Their assessment of program strengths provided assurance of overall validity, while identification of specific weaknesses provided guidance for program improvement.

Q.14. Was the 1983 INPO generic job/task analysis used in the continued development of the TMI licensed operator training program?

A.14. The 1983 publication by INPO of generic job/task analysis results for licensed operators allowed comparison of the analyses to TMI-1 licensed operator OJT task sheets. Through this process, TMI Training revised the on-the-job training program using the performance requirements established by INPO.

Perhaps even more importantly, the INPO analysis provided a useful benchmark for developing training materials for the Basic Principles Training Simulator (BPTS). The design of the BPTS itself owes much of both its hardware configuration and instructor-console software to upfront table-top task analysis and resulting behavioral learning objectives developed by Operations, Training, and Technical Functions personnel. BPTS training development used the much more detailed INPO results to identify those tasks for which the device is best suited. At the same time, tasks suited for training on a full scope

simulator were also identified. This process supported on-going training at what was then the B&W simulator and also was used in the development of specifications for the TMI-1 replica simulator ultimately ordered from Singer-Link.

The Training Department also has taken the INPO generic job/task analysis results and prepared a job-analysis task list for the licensed operator. This was done using the plant-specific information provided previously to INPO by the TMI-1 licensed operators and a supplemental job analysis conducted by GPU Nuclear. Using this list, tasks are being identified which are appropriate for inclusion in the licensed operator training program. A matrix will identify whether each task is taught in the classroom and/or on the job. The matrix also will be used to upgrade the task descriptions and performance standards contained on the OJT qualification cards.

Q.15. Has TMI applied for INPO accreditation?

A.15. Yes. The TMI Training Department has completed a self-evaluation report in support of INPO accreditation for the licensed operator training programs. An accreditation team visited the site in early October, 1984 and is currently preparing its report.

Q.16. How is the operations plant manual used to further facilitate performance-based training?

A.16. The operations plant manual (OPM), the majority of which was issued in early 1984, provides a single reference for the base subject-matter that licensed operators need for

their jobs. Developed primarily by Operations personnel, it has been supplemented through reviews by Training and Technical Functions. The presence of behavioral learning objectives for each section of the OPM provides focus not only on the key subject matter but also on the important cognitive levels associated with each element. It is extremely useful to training personnel, operators and operator candidates as a reference tool that corresponds to both the training subject-matter and the job performance requirements.

Q.17. Are the performance-based training methods used by GPU Nuclear identical to the method recommended by Dr. Regan?

A.17. No. However, our methods are consistent with Dr. Regan's recommendations and certainly have involved many of the same elements that he recommends. Moreover, it is important to recognize that there are practical and legitimate constraints on our ability to implement a performance system such as Dr. Regan recommends. The licensed operator training programs in place at TMI-1 are ongoing programs, implemented on a continuous basis to a fairly small group of individuals. In this framework, test reliability, for example, is not readily established on a statistical basis. Standardization also may be impractical, as training needs change rather quickly.

Perhaps it is stating the obvious to note that when we decided to introduce performance-based training at TMI, it was not possible to shut down the operator training programs while

we thoroughly analyzed, designed and developed them. Instead, it was necessary to continue to train operators. Over the past four and a half years, particularly with the development of the INPO job/task analyses, we have expended considerable resources and effort to correlate our program with and revise it on the basis of performance criteria. In our opinion, accomplishing this effort in an evolving manner has been both necessary and advantageous.

Q.18. Do you have any concluding remarks?

A.18. Yes. The TMI-1 licensed operator training program is performance-based. Notwithstanding the shutdown of TMI-1, the program's validity has been and continues to be tested by various means, such as the capabilities of the trainees on-the-job, at the simulators, in-plant drills and on examinations (oral and written). Independent evaluations have occurred, as well, e.g., by the NRC Staff, OARP Committee, DDL, Rickover and INPO. Numerous feedback mechanisms from trainees and Operations management to Training exist to factor in the users' views of the program. In short, the program does prepare operators to safely operate TMI-1.

## RONALD ALLEN KNIEF

Professional ExperienceCurrent Position

1984-Present      Manager, Special Projects -- Permanent member of TMI-2 Programmatic Safety Overview Committee (PSOC); GPU Nuclear Corp.; Middletown, Pennsylvania

1983 - 1984      Manager, Educational Development; GPU Nuclear Corp.; Middletown, Pennsylvania

1980 - 1983      Manager, Plant Training; Three Mile Island Nuclear Station; GPU Nuclear Corp.; Middletown, Pennsylvania

1977 - 1980      Associate Professor; Department of Chemical and Nuclear Engineering; University of New Mexico; Albuquerque, New Mexico

1975 - 1980      Licensed Senior Reactor Operator for UNM AGN-201M Training Reactor (Chief Reactor Supervisor 1976 - 1980)

1977              Consulting Fuel Facility Inspector; U.S. Nuclear Regulatory Commission, Region III; Glen Ellyn, Illinois

1974 - 1977      Assistant Professor; Department of Chemical and Nuclear Engineering; University of New Mexico; Albuquerque, New Mexico

1972 - 1974      Senior Physicist; Reactor Physics and Computational Analysis; Combustion Engineering, Inc.; Windsor, Connecticut

Summer 1969      Research Associate; Nuclear Safeguards Research & Development Group; Los Alamos Scientific Laboratory; Los Alamos, New Mexico

Summer 1968      Research Associate; Fission Physics Research Group; Lawrence Livermore Laboratory; Livermore California

1965 - 1967      Laboratory Teaching Assistant; Department of Physics; Albion College; Albion, Michigan

Ancillary Educational Activities

1975 - 1979/  
Present            Director/Consulting Director; Short Courses on Nuclear Criticality Safety (Seven courses through 1979/Three through 1983)

1980 - Present    Adjunct Associate Professor; Department of Chemical and Nuclear Engineering; University of New Mexico; Albuquerque, New Mexico

- 1981 - Present Adjunct Associate Professor; Nuclear Engineering Department; Pennsylvania State University; State College, Pennsylvania
- 1984 Lecturer; IAEA Nuclear Power Course on Safety and Reliability in Nuclear Power Plant Operation; Co-Sponsored by Argonne National Laboratory and the International Atomic Energy Agency; Argonne, Illinois
- 1983 Lecturer; DOE Course on Prevention of Significant Nuclear Events; U.S. Department of Energy; Gaithersburg, Maryland, Salt Lake City, Utah, and Knoxville, Tennessee
- 1978 - 1981 Staff Member and Lecturer; International Training Courses on Physical Security for Nuclear Facilities; Co-Sponsored by Sandia Laboratories, U. S. Department of Energy, and International Atomic Energy Agency; Albuquerque, New Mexico
- 1975 - 1980 Instructor; Nuclear Engineering Orientation (1975 - 1977) and Nuclear Energy Technology (1978 - 1980) courses; Sandia Laboratories; Albuquerque, New Mexico
- 1976 - 1980 Director; Citizens Workshops on Energy and Environment for New Mexico (over 200 presentations to school, civic, and professional groups)
- 1980 Staff Member and Lecturer; International Training Course on Nuclear Materials Accountability for Safeguards Purposes; Co-Sponsored by Los Alamos Scientific Laboratory, U. S. Department of Energy, and International Atomic Energy Agency; Santa Fe, New Mexico
- 1972 - 1974 Adjunct Faculty Member; Physics Department; University of Hartford; West Hartford, Connecticut

### Education

B.A.	Physics, Mathematics, Economics	Albion (Michigan) College	1967
Ph.D.	Nuclear Engineering	University of Illinois at Urbana-Champaign	1972

## Specialized Education and Training

- DOE Course on Prevention of Significant Nuclear Events, March 1983
- Introduction to Power Plant Operations for Utility Executives, Westinghouse POTC Simulator, 1982.
- TMI Emergency Director/Emergency Support Director Courses, 1982.
- TMI-1 Safety Review Course, 1982.
- Sr. Management TMI-1 (Systems) Training Program, 1981.
- GPUN Management Development Program, 1981.
- Public Speaking and Issue Development Program, Smith & Harnoff, 1981.
- Faculty Institute on LMFBR Safety, Argonne National Laboratory, 1978.
- Faculty Institute on Light Water Reactor Safety, Argonne National Laboratory, 1976.
- CSUI/ANL Student Research Participation Program, Argonne National Laboratory, Spring Semester, 1966.

## Honors and Awards

- Who's Who in the East 1981 - Present
- Who's Who in Technology Today 1979 - Present
- Who's Who in the West 1979-1981
- Outstanding Young Man of 1979 (U.S. Jaycees)
- U.S. Atomic Energy Commission Special Fellowship in Nuclear Engineering, University of Illinois, 1968-71
- Woodrow Wilson National Fellowship for College Teaching, University of Illinois, 1967-68

## Albion College

- Highest Honors (Magna Cum Laude) and Departmental Honors in Physics, 1967
- Sigma Pi Sigma and DeNooyer Prizes in Physics, 1967
- Phi Beta Kappa Academic Honor Society, 1966
- Omicron Delta Kappa Leadership Honor Society, 1967
- Sigma Pi Sigma (Physics), Kappa Mu Epsilon (Mathematics), and Omicron Delta Kappa (Economics) Honor Societies, 1965
- Phi Eta Sigman Freshman Honor Society, 1964

## Books

Knief, R. A., Nuclear Energy Technology: Theory and Practice of Commercial Nuclear Power, Hemisphere Publishing Corp. and McGraw-Hill Book Co., 1981

Knief, R. A., Nuclear Criticality Safety: Theory and Practice (manuscript submitted to the American Nuclear Society for 1984 publication)

Knief, R. A., "Nuclear Steam Supply Systems," in Elliott, T. C. (Ed.), Standard Handbook of Powerplant Engineering, McGraw-Hill Book Co. (in preparation)

## Papers, Reports, and other Presentations

Knief, R. A., Long, R. L., and Newton, S. L., "Training Requirements at TMI -- Harbinger for the Industry?," Trans. Am. Nucl. Soc., 45, 195 (1983).

Knief, R. A., Long, R. L., and Newton, S. L., "Training Requirements at TMI -- Lessons for Nuclear Industry?," 2nd Annual International Nuclear Education Conference, Rochester, NY, Sept. 27-29, 1983.

Knief, R. A. and Masia, B. B., "New Perspectives on Testing and Evaluation at GPU Nuclear," 2nd Annual International Nuclear Education Conference, Rochester, NY, Sept. 27-29, 1983.

Knief, R. A., "Nuclear Criticality Safety Training for TMI-2 Operators," Trans. Am. Nucl. Soc., 44, 306 (1983).

Long, R. L., Gaines, D. P., and Knief, R. A., "Nuclear Personnel Training After TMI-2: The GPUN Response," Prog. Nucl. Energy, 10, 349 (1982).

Knief, R. A., "Achieving and Maintaining Training Quality at TMI," Westinghouse POTC Institute Day, Monroeville, PA, October 5, 1982.

Irizarry, C. A., Jones, J. W., and Knief, R. A., "Instructor Development at Three Mile Island," Personnel Selection and Training Bulletin, 3, 81 (1982).

Knief, R. A., "Radiation Protection Training at TMI," ANS/HPSA Meeting on Radiation Safety Training, Pittsburgh, PA, March 5-6, 1982.

Knief, R. A., Boltz, D. J., and Irizarry, C. A., "Behavioral Learning Objectives for Plant Simulation at TMI," Trans. Am. Nucl. Soc., 39, 281 (1981).

Knief, R. A. and Long, R. L., "Behavioral Learning Objectives for Simulator Training," Society for Applied Learning Technology Conference on Simulation and Training Technology for Nuclear Power Plant Safety, Arlington, VA, September 17 - 18, 1981.

Irizarry, C., Jones, J., and Knief, R. A., "Instructor Development Program at TMI," ANS Symposium on Training of Nuclear Facility Personnel, Gatlinburg, TN, CONF-810411, April 27 - 29, 1981.

### Professional Societies

American Association for the Advancement of Science (1976 - Present)

American Nuclear Society (1971 - Present)

Member, Student Affairs Subcommittee (1976 - Present)

Member, Engineering & Technology Accreditation Registration & Professional Development Committee (1982 - Present)

Chairman, Central Pennsylvania Section (1983-84)

Chairman, Nuclear Criticality Safety Division (1980-81)

Chairman, New Mexico Trinity Section (1977-78)

American Physical Society (1967 - 1982)

Institute of Nuclear Materials Management (1977 - Present)

Society of Sigma Xi (1972 - Present)

### Other Professional Activities

Consultant, Sandia National Laboratories (1974 - Present)

Reviewer, McGraw-Hill Book Company (1979 - Present)

Evaluator, New York Regents' Program on Non-Collegiate Sponsored Instruction (1980 - Present)

Reviewer, U.S. Department of Energy Traineeship Programs (1980 - Present)

Visitor, Accreditation Board for Engineering and Technology (1982 - Present)

Reviewer, Hemisphere Publishing Corporation (1982 - Present)

Visitor, INPO Accreditation (1983 - Present)

Consultant, United Nuclear Corporation (1979)

Consultant, Argonne National Laboratories (1977)

### Community Activities

Member, TMI Speakers Bureau 1980 - Present

American Red Cross Water Safety Instructor 1964 - 1981

YMCA Specialist Instructor in Water Safety 1976 - 1980

Member, Nuclear Medicine Committee, Veterans Administration Hospital, Albuquerque, New Mexico 1976 - 1980

Teaching Record

University Courses [No. of times]

University of Hartford

- Physics 111: General Physics I [2]  
Physics 112: General Physics II [2]

University of New Mexico

- Engr. 101: Intro. to Engineering [1]  
N. E. 420: Fundamentals of N. E. (Nuclear Physics) [1]  
N. E. 423L: Radiation Measurements Laboratory [1]  
N. E. 430: Intro. to Nuclear Engineering [2]  
N. E. 461: Reactor Design Analysis [2]  
N. E. 465: Nuclear Power Systems [1]  
N. E. 465: Nuclear Energy Technology [1]  
N. E. 466: Environmental Safety Analysis [1]  
N. E. 502: Methods of Nuclear Safety and Safeguards [2]  
N. E. 510: Reactor Theory I [4]  
N. E. 511: Reactor Theory II [5]

Pennsylvania State University, Capitol Campus

- ET 497A: Nuclear Energy Technology [1]

GPUN Courses/Sessions [No. of times]

- |  |                            |          |
|--|----------------------------|----------|
| TMI-1 Licensed-Operator Candidates         | Basic Reactor Theory       | 16 hr    |
| TMI-2 Licensed-Operator<br>Requalification | Nuclear Criticality Safety | 4 hr [7] |
| TMI-1 Licensed-Operator<br>Requalification | Risk Assessment            | 4 hr [5] |
| Shift Technical Advisors                   | Advanced Reactor Theory    | 20 hr    |
| Engineering Staff - Hdqtrs                 | Nucl. Energy Tech. Topics  | 4 hr     |
| - Reading                                  |                            | 8 hr     |
| - TMI                                      |                            | 4 hr     |
| TMI-2 Safety Review Group                  | Nuclear Criticality Safety | 2 hr     |

Reilly, K., Getty, C., and Knief, R. A., "College Credits for In-House Training," ANS Symposium on Training of Nuclear Facility Personnel, Gatlinburg, TN, CONF-810411, April 27 - 29, 1981.

Knief, R. A., "Potential Impacts on Material Safeguards on Nuclear Criticality Safety," Trans. Am. Nucl. Soc., 35, 291 (1980).

Knief, R. A., "Education in Nuclear Criticality Safety," Proc. ANS Topical Meeting on Nuclear Criticality Safety, El Paso, Texas, SAND80 - 1675, April 8 - 10, 1980.

Knief, R. A., "Nuclear Fuel Cycle Education Module on Nuclear Criticality Safety," Trans. Am. Nucl. Soc., 33, 119 (1979).

Morel, J. E., Allen, R. C., and Knief, R. A., "Particle Transport in an Anisotropic Medium," Trans. Am. Nucl. Soc., 30, 249-350 (1978).

Bradshaw, D. T., Taylor, O. W., and Knief, R. A., "Preliminary Fuel Component Price Sensitivity Analysis of Alternative Reactor Fuel Cycles," Trans. Am. Nucl. Soc., 30, 305-307 (1978).

Knief, R. A., Five lectures on nuclear fuel cycle, reactors, and reactor operations, "International Training Course on the Physical Protection of Nuclear Facilities and Materials," SAND 79-1090, Albuquerque, NM, May 1979.

Knief, R. A., "Nuclear Safeguards for Waste Management Facilities" International Fuel Cycle Evaluation, Working Group 7, Sandia Laboratories Internal Report RS 1754/1023, December 1978.

Knief, R. A., "Overview of the Nuclear Fuel Cycle," Proc. ASME Symposium on Non-Proliferation, Albuquerque, NM (1978).

Knief, R. A., "University Activities in Criticality Safety Education," Trans. Am. Nucl. Soc., 27, 402-403 (1977).

Knief, R. A., "Equation of State Studies Required for Fast Reactor Safety Analysis," University of New Mexico Report, April 1977.

Knief, R. A., "Nuclear Criticality Safety Workshops for Graduate Students," Trans. Am. Nucl. Soc., 24, 67-68 (1976).

Knief, R. A., Wehring, B. W., and Wyman, M. E., "Measurements of Time-Dependent Energy Spectra of Beta Rays from Cf-252 Fission Fragments," Nucl. Sci. Eng., 53, 47 (1974).

Augustson, R. H. Holm, D. H., and Knief, R. A., "Detailed Gamma Scan of SEFOR Fuel Rods," Los Alamos Scientific Laboratory Report LA-4227-MS, 1969.

Augustson, R. H., Menlove, H. O., and Knief, R. A., "Non-Destructive Assay of SEFOR Fuel Rods," Los Alamos Scientific Laboratory Report LA-4227-MS, 1969.

Menlove, H. O., and Knief, R. A., "Neutron Self-Indication Assay for SEFOR Fuel Rods," Los Alamos Scientific Laboratory Report LA-4315-MS, 1969.

Sr. Management	Risk Assessment	2 hr
Communications Staff	Basic Theory and Practice	4 hr [4]
Instructor Development	Testing & Evaluation	2 hr [5]
	Role of the Instructor	2 hr
	Training System Design	2 hr
	Principles of Instruction	4 hr

(See Also Ancillary Educational Activities)

RESUME

NAME: Bruce P. Leonard DATE: 11/1/84

FUNCTIONAL TITLE: Operator Training Manager

EMPLOYEE EXPERIENCE:

PRESENT:

Operator Training Manager - 5/83 to present. Responsible and accountable for the overall management, development, and implementation of high-quality, efficient, and effective Licensed Operator, Non-Licensed Operator, and Shift Technical Advisor (STA) Training programs which comply with regulatory and corporate training requirements.

PREVIOUS:

Technical Programs Specialist - 11/82 to 5/83. Assist Operator Training Section Head in on-going review, evaluation, and revision of training programs for Licensed and Non-Licensed Operators and STA's.

Staff Training Officer, S3G Prototype, Naval Nuclear Power Training Unit, Ballstonspa, NY, 12/81 - 10/82. Military Department Head for approx. 150 qualified Nuclear Operators/Instructors. Responsible for Implementation and Enforcement of Training Programs including Chemistry, Radiological Controls, Maintenance and Operations for 150 staff.

Leading Engineering Officer of the Watch, S3G Prototype. 10/80 - 12/81. Responsible for coordination of training of 35 staff operators and 60 students. Responsible for maintenance assigned to crew. Responsible for operational readiness of crew.

Damage Control Assistant, Communicator, USS Daniel Webster S5BN 626, 10/78 - 9/80. Division Officer.

MILITARY EXPERIENCE:

U.S. NAVY, Highest Rank: Lieutenant, Active Duty  
Commissioned 6/76 - 10/82.

Schools Included: Naval Nuclear Power Training, 1 yr. 10/76 - 10/77; Submarine Officers School, 3 mo. 10/77 - 02/78; Quality Assurance School, 2 weeks, 10/78; Communicators School, 1 week 2/80; Drug and Alcohol Program Advisor School, 2 weeks, 6/79; Controlled Material System School, 1 week, 2/80; Engineer Officer School, 4 weeks, 6/80; Damage Control School, 1 week, 6/78; Water Chemistry Control School, 2 weeks, 12/79. Instructor Development 11/80.

EDUCATIONAL AND SPECIALIZED TRAINING:

HIGH SCHOOL:

Corning West High School, Corning, NY 14830; Graduated 1972

NON-DEGREE COLLEGE

N/A

DEGREES:

Bachelor of Science-Engineering - Naval Architecture; US  
Naval Academy 1976.

MAJOR TMI JOB RELATED COURSES:

See Military Schools above under military.

Decision Analysis - 7/83

Instructor Development - 9/83

Manager Development - 4/84

CERTIFICATES/LICENSES:

PRESENT: Engineer in Training, State of Pennsylvania

PAST: Qualification as Engineer Officer, US Navy  
(Nuclear) Start-up Certificate B & W 4/84

PUBLICATIONS:

None

PROFESSIONAL AFFILIATIONS:

NONE

ADDITIONAL INFORMATION:

N/A

1 MS. BAUSER: The witnesses are available for  
2 cross-examination.

3 JUDGE SMITH: Mr. Jordan.

4 MR. JORDAN: Thank you, Your Honor.

5 CROSS-EXAMINATION

6 BY MR. JORDAN:

7 Q I understand, gentlemen, that you have in place  
8 an instructor development program?

9 A (Witness Leonard) Yes, sir, we do.

10 A (Witness Knief) Yes.

11 Q When was that program actually finalized into  
12 this program that it is today?

13 A That is somewhat difficult to answer directly  
14 because based on a training system development approach,  
15 the course will never be truly finalized.

16 We started conducting the course first in the  
17 fall of 1980, and with every subsequent administration of  
18 the course there have been some changes. The course as it  
19 is offered right now has been quite similar for about the  
20 last year and a half. But each time it is offered there  
21 are minor changes.

22 Q I am sure you recall -- well, I think you were  
23 in the room, I am not sure, when Dr. Gardner testified  
24 to the effect that -- I am not exactly sure what the subject  
25 was -- but something that was never finalized because it

Sim 6-9

1 is always changing. And I am sure that that is the case.  
2 That is true of anything. But there are major changes made  
3 to programs such that they at least reach substantially  
4 their current form and then continue to change incrementally.

5 This program came into substantially its current  
6 form then subject to the incremental changes you have  
7 suggested, and correct me if I am wrong, I think you said  
8 a year or a year and a half ago?

9 A Roughly a year and a half ago.

10 Q I would you to, if you would, keep that point  
11 in mind about the way that things change, and I would like  
12 to ask you about the so-called TSD model. I take it the  
13 company seeks now to implement the TSD model?

14 A The company seeks to continue implementation. We  
15 have already started that.

16 Q And you actually, interms of implementing the  
17 TSD model, if you will, in substantially its present form,  
18 that was something that occurred in 1983?

19 A That is correct.

20 Q On page 9, question and answer 12, you discuss  
21 work done in connection with the INPO industry-wide job  
22 task analysis effort.

23 You state that "TMI 1 supported the effort  
24 by having licensed operators complete surveys. I want to  
25 refer to that particular part first. These were surveys

1 from INPO about what they do on their jobs?

2 A That is correct.

3 Q To your knowledge, were these surveys from  
4 TMI-1 and other utilities then used by INPO to develop INPO's  
5 generic job task analysis?

6 A Yes, they were.

7 Q Did all of the nuclear utilities provide this  
8 information?

9 A I am not aware of whether every utility did.

10 Q Are you aware that a number of them did?

11 A Yes. A substantial number of the utilities  
12 did.

13 Q Tell me if you know the answer to this. My  
14 question is whether INPO's purpose in surveying all of the  
15 utilities was to have essentially full information so that  
16 they could then develop the generic task analyses that they  
17 eventually used?

18 A Their intent was to accumulate a substantial  
19 knowledge base. There is a possibility of some random  
20 selection, that say if a large utility was asked to fill  
21 out the questionnaires, they may not have been requested  
22 or may not have decided to survey operators at all of the  
23 plants for which they were responsible.

24 But the intent was to get a representative  
25 sample of the licensed and non-licensed and certain other

Sim 6-11 1 positions on a nationwide basis.

2 Q And then I take it the participation and valida-  
3 tion exercises conducted at INPO headquarters, that is  
4 further mentioned in that sentence refers to licensed  
5 operators attending meetings and discussing in essence the  
6 information they put in their surveys?

7 A That is correct. Although maybe I need to  
8 clarify. They were likely never asked to comment on what  
9 went into their own surveys, but instead they were there to  
10 discuss the compiled results and to look at the job in a  
11 more generic manner.

12 As far as I am aware, none of the questionnaires  
13 were provided by name.

14 Q I see. So if I follow you then, in a sense they  
15 were -- I suppose they were probably looking at a draft  
16 or an early stage of the INPO generic job task analysis  
17 that had been based upon survey information in essence to  
18 say whether it was correct or not or to provide whatever  
19 comments they felt appropriate on the generic analyses?

20 A That is my understanding.

21 Q You state further in answer to that question,  
22 question 12, that educational technologists from TMI and  
23 Oyster Creek had participated in INPO workshop sessions.  
24 When did that happen?

25 A My recollection was that that was late in 1981.

Sim 6-12

1 And then to some extent extending into 1982.

2 Q I take it that your testimony on page 11 refers  
3 to the operations plant manual. I understand from that that  
4 the majority of that manual was issued early in 1984, but  
5 I understand that manual is not complete; is that right?

6 A (Witness Leonard) Yes, sir, that is correct.

7 Q I believe there was testimony as to what is not  
8 yet included, but perhaps the record would be clarified here  
9 if you would explain what is not yet complete, what sections  
10 or parts of the operations plant manual are not yet complete?

11 A Sir, to the best of my knowledge, the sections  
12 that are not completed are the fundamental sections which  
13 I think are Volumes 7 and 8.

14 Q What sections were completed between early 1984,  
15 when the majority of the plant manual was issued, and today?

16 A Sir, without a record of the dates that each  
17 section was completed, I can't give you the answer to that.

18 Q But can you confirm for me that the majority  
19 was issued in early '84, and then some more sections were  
20 completed from then to now, and now the status is as you  
21 have just explained?

22 A Yes, sir, that appears correct, that the majority  
23 of the manual was issued in early 1984 and there has been  
24 issuance of individual sections since that time. But the  
25

Sim 6-13 1 fundamental sections still remain to be issued.

2 Q How large is the manual, nine volumes I think?

3 A Yes, sir, nine volumes, and that is really not  
4 representative of each section, each volume being one-ninth  
5 of the total topics in the manual.

6 The manual is broken down into individual areas,  
7 and without an index in front of me I can't give you  
8 specifically, but it is like Section A through P or Q or R,  
9 and each one of those sections has several topics within  
10 it. Section B may be the primary systems and within that  
11 there may be five or six sections addressing the reactor  
12 coolant system, reactor coolant pumps, makeup, purification,  
13 et cetera. So the nine volumes really don't represent --  
14 if I pull Volume I out, that is one-ninth of the total  
15 sections that were issued. It is just representative that  
16 that is what fit into that one volume.

17 Q Now the fundamentals part of the manual I would  
18 expect is probably relatively -- you seemed to identify  
19 two volumes?

20 A Yes, sir.

21 Q That I would guess is a good deal less than  
22 two-ninths of the total.

23 A As far as the number of topics, it is significantly  
24 less than one ninth.

25 Q Oh, less than one-ninth?

Sim 6-14

1 A Or two-ninths, correction, whatever.

2 Q In other words, the number of volumes would  
3 not be an accurate reflection of how much of that manual  
4 is made up of the fundamentals sections?

5 A Yes, sir. As I stated before, the topics  
6 within those two volumes don't represent two-ninths of the  
7 topics, of the total topics covered.

8 Q Other than fundamentals, I take it the rest  
9 of the manual encompasses, if you will, the practicals,  
10 the procedures and the actual day-to-day operations, although  
11 it is not used for that purpose, but it reflects the hard-  
12 ware and the procedures and so on? Is that a correct  
13 understanding?

14 A No, sir, that is not correct. As discussed  
15 in previous testimony, the manual addresses systems. It  
16 does not address, it is not a procedural guidance. It is  
17 not a manual by which we tell the operators to operate the  
18 plant. It is a reference manual including specifics on  
19 the systems, and it is not a procedural guidance.

20 Q Okay. That is the problem of not speaking  
21 your language very well on my part.

22 But I guess my question is whether outside  
23 the fundamentals, which we have discussed, the rest of the  
24 manual is the systems material that you have just described?

25 A Yes, sir, the rest of the manual, the majority,

Sim 6-15

1 is systems.

2 MR. JORDAN: I have no more questions.

3 JUDGE SMITH: Mr. Au.

4 MR. AU: I just have two short questions.

## 5 CROSS-EXAMINATION

6 BY MR. AU:

INDEX

7 Q On the bottom of page 6 in response to Question  
8 No. 8, you used the term "table top." It appears in the  
9 last line of the answer. We had some concerns about what  
10 the meaning of table top was in this hearing. Did you mean  
11 table top to mean the same as informal, or do you mean  
12 something else?

13 A (Witness Knief) Table top does essentially  
14 mean informal, but another term that is used somewhat  
15 synonymously is that of using a subject matter expert  
16 approach where you get together subject matter experts that  
17 represent a variety of perspectives, and in our case it  
18 was typically the operations personnel, training personnel,  
19 some of whom are also licensed, and then the third possibility  
20 is that of our technical functions or corporate engineering  
21 organization.

22 Q In this context did you mean table top to mean  
23 getting together of a group of different experts or a  
24 brain storming session?

25 A It is assembling the group. Brain storming

Sim 6-16

1 may not be quite the right word, but at least for a work  
2 session where learning objectives or some other perspective  
3 on a particular training task is to be conducted.

end Sim  
Joe fols

- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25

1           A       (Witness Leonard) In addition to that, the  
2 brainstorming technique, as it is commonly referred to,  
3 would not be the method we used in these tables -- the  
4 brainstorming ideas that have been discussed before. That  
5 type of approach would not have been used in this type  
6 analysis.

7           Q       Okay. So you are saying in this context brain-  
8 storming is inaccurate?

9           A       (Witness Knief) Correct.

10          Q       On the top of page 10, you stated that GPU Nuclear  
11 contracted with Data Design Laboratories to perform extensive  
12 evaluation of these programs. Was the purpose of the DDL  
13 project to prepare GPU Nuclear for the self-evaluation report?

14          A       No, it was not.

15          Q       It had an independent purpose?

16          A       Yes, it did.

17          Q       And what was that independent purpose?

18          A       At that point, the primary purpose was to be  
19 responsive to a recommendation that had come from this Board  
20 about an independent evaluation of the program, and although  
21 the Board recommendation -- and perhaps I am using the word  
22 wrong --

23                   JUDGE SMITH: Yes, you are.

24                   WITNESS KNIEF: Requirement.

25                   JUDGE SMITH: Yes.

1 WITNESS KNIEF: Their requirement was that the  
2 independent evaluation be done two years after restart. We  
3 decided to do the evaluation up front so that we would then  
4 have a benchmark which to compare the two year evaluation.

5 JUDGE SMITH: Mr. Au, should I infer that you are  
6 not familiar with that condition.

7 MR. AU: I am familiar with the condition that  
8 GPU do an evaluation two years after restart.

9 BY MR. AU: (Continuing)

10 Q I am trying to explore whether the DDL Report had  
11 any connection with the self-evaluation report, that is all.  
12 That was my sole purpose in asking this question.

13 A (Witness Knief) If I may expand on that a little  
14 bit. Historically, the IMPO accreditation guidelines came  
15 out roughly simultaneously, and so although when we started  
16 the evaluation that was not our intent. Part way through,  
17 DDL asked us to prepare a self-evaluation.

18 So, as a result of the DDL inquiry, we had what  
19 turned out to be the first draft of the self-evaluation. When  
20 we prepared the IMPO accreditation self-evaluation last year,  
21 and a little bit the previous year, we certainly used this  
22 document as our starting point.

23 MR. AU: Thank you. I don't have any other  
24 questions.

25 JUDGE SMITH: Ms. Wagner?

1  
2 BY MS. WAGNER:

3 Q Gentlemen, you refer on the top of page 8 to IMPO  
4 guidelines for licensed operator training. Just so it is  
5 clear, these are not the IMPO accreditation guidelines, is  
6 that right?

7 A (Witness Knief) That is correct. These are  
8 what would be called the program guideline.

9 Q Is GPU's training program based on these guidelines?

10 A GPUN's training program is very consistent with  
11 these guidelines. Our program was actually developed before  
12 the guidelines were issued, and so I would not say that  
13 we based our program on the guidelines.

14 In fact, we have some reason to believe that the  
15 guidelines may be somewhat based on our program.

16 Q Are these IMPO guidelines based on JTA?

17 A I do not believe that was the case. I believe these  
18 guidelines were issued before the job task analysis project  
19 was far enough along.

20 Excuse me. If I may rephrase that a little bit.  
21 There is a tendency for us to get into the mind set that when  
22 JTA is mentioned, we think of the formal process. But if we  
23 think instead in terms of what we call the table top, or the  
24 subject matter expert type job task analysis, the less formal  
25 process, this was something that was definitely incorporated

1 by IMPO, that they did use subject matter experts to prepare  
2 those guidelines.

3 But the formal job task analysis process had not  
4 progressed far enough at the time.

5 Q But I understand that GPU Nuclear will be  
6 incorporating the JTA process in its training program?

7 A (Witness Leonard) Yes, ma'am.

8 Q And can you explain how that program -- GPU Nuclear's  
9 program will then -- will it continue to be consistent with the  
10 IMPO guidelines?

11 A Are you referencing the program guidelines?

12 Q That is right. I believe it was just stated that  
13 while the training program is not based on the guidelines, it  
14 is consistent with the guidelines, and since the IMPO guidelines  
15 -- it was also just stated -- are not based on a formal,  
16 structured JTA, as Mr. Knief just explained, how will GPU  
17 Nuclear's program continue to be consistent with the guidelines?

18 You understand the question?

19 A (Witness Knief) Yeah. Let me handle that. We  
20 are committed to continue to evaluate our training program  
21 against the IMPO guidelines and to maintain consistency, or  
22 at least have a very definite reason for taking exception to  
23 any portions of it.

24 The guidelines themselves are generic enough that  
25 I would not expect that they would change very much as a result

1 of the JTA.

2 It will be other parts -- the details of the program  
3 that will change as a result of the job task analysis, and  
4 that will likely not be reflected in the rather brief content  
5 guidelines that IMPO issues.

6 MS. WAGNER: Thank you. I have no further  
7 questions.

8 JUDGE SMITH: The Board has no questions.

9 MS. BAUSER: Judge Smith, I would ask if I could  
10 have again a few minutes. I want to talk to the parties if  
11 I could for a minute, before asking a question.

12 (Ms. Bauser consults with parties)

13 MS. BAUSER: Judge Smith?

14 JUDGE SMITH: Yes.

15 MS. BAUSER: I have one question for Dr. Knief,  
16 which is a question about Dr. Regan's surrebuttal testimony,  
17 which responds to the rebuttal testimony that these witnesses  
18 are testifying about.

19 Mr. Jordan rightfully would like to discuss their  
20 response to Dr. Regan's response with Dr. Regan. I have --

21 JUDGE SMITH: Where are we going?

22 MS. BAUSER: I have said that I would like to ask  
23 this question now. If Mr. Jordan feels it is necessary when  
24 we have to call back Mr. Newton, Mr. Leonard, and Mr. Ross,  
25 to ask a follow-up, I will bring Dr. Knief back. Mr. Leonard

1 will already be here, and he can ask his follow up question.

2 I am hopeful that that won't be necessary, and  
3 this panel can be excused and not come back.

4 JUDGE SMITH: The implications of Dr. Regan coming  
5 back that is where --

6 MS. BAUSER: No, no. That is not, I believe, what  
7 we are talking about.

8 MR. JORDAN: I have agree to what counsel has just  
9 suggested, but I do want to say that you will recall I  
10 discussed in the course of things the possibility of putting  
11 Dr. Regan on with his -- to people to whom he was rebutting,  
12 and to who might further rebut him -- I received no indication  
13 that there would be any rebuttal to what he was saying, and  
14 so I essentially decided well, I will take the risk of  
15 dealing with the rebuttal.

16 Now, I might well have decided not to do that had  
17 I knowr that this was going to happen. And I can say it is  
18 conceivable, and although highly unlikely, that I would want  
19 Dr. Regan to be able to respond to this.

20 JUDGE SMITH: This is rebuttal, surrebuttal,  
21 -- rebuttal to surbebuttal, and the possibility of rebuttal to  
22 that yet. And that is -- I have run out of prefixes. I  
23 can't describe it.

24 MS. BAUSER: My concern, the paragraph, and I  
25 will get right to it, is the matter of Dr. Regan interpreting

1 something in the testimony of these witnesses, and I am hoping  
2 we can clarify that interpretation, so it really does relate  
3 to this testimony.

4 JUDGE SMITH: The risk that I perceive doesn't  
5 seem to be there, so just go ahead with it.

6 MS. BAUSER: Doctor Knief --

7 MR. JORDAN: I am sorry. I agree the risk is  
8 minimal, but --

9 JUDGE SMITH: You do not agree it is nonexistent.

10 MR. JORDAN: I do not agree it is nonexistent.

11 BY MS. BAUSER: (Continuing)

12 Q Doctor Knief, do you have the rebuttal -- sur-  
13 rebuttal testimony of Dr. Regan in front of you?

14 A (Witness Knief holds up document)

15 Q On page 5 of that testimony, Dr. Regan comments  
16 on the concern that he has -- that you may have a misunder-  
17 standing of the application of the TSD approach based  
18 on Answer 8 in your testimony.

19 I wonder if you could elaborate on Answer 8 in  
20 order to clear up this possible misunderstanding.

21 A (Witness Knief) In reading his testimony, this  
22 was certainly one of the questions that I had, and maybe one  
23 of the easiest ways would be to describe it in terms of a  
24 personal experience of my own.

25 When I first started teaching at the University of

1 New Mexico, I was assigned the Reactor Theory course, and  
2 given the amount of time that I had to prepare was minimal,  
3 and that the textbook had already been selected, I went ahead  
4 and taught the course, and based on the evaluations both of  
5 my Department Chairman and also by the students, I did a  
6 good job in developing course materials, and I did a good  
7 job in the presentations, and also with the examinations.

8           However, I had no opportunity to really do the  
9 up front analysis to really take a good look at what job  
10 the people would be doing based on this course material, and  
11 I also did not have the opportunity to develop the behavioral  
12 learning objectives.

13           The TSD approach, if you start in the middle, like  
14 I was forced to, at least to me it says that the key piece is  
15 evaluation. That once you have completed a cycle, or at  
16 any intermediate location, you evaluate and then determine  
17 what it takes to do it right the next time.

18           The next time around, during the summer before  
19 I taught that course, I sat down and used what we could call  
20 the subject matter expert approach, which -- in which case  
21 I actually just focused that internally, because I, myself,  
22 had done the job. I had been an individual doing reactor  
23 fuel management and running the kinds of computer codes that  
24 were based on the theory that we were teaching in this course.

25           And as a result, I significantly redesigned the

1 course, started to use behavioral learning objections,  
2 although I was not at that stage familiar with the fact that  
3 what I was using really were learning objectives.

4 I didn't read the Meager book until part way through  
5 the Fall Semester that year.

6 I took the approach of using a TSD, ISD, or whatever  
7 you want to call the model, or SAT as the Nuclear Regulatory  
8 Commission has chosen to use. I used that approach and think  
9 I did it appropriately for a program that was already in place.  
10 And we pointed out in our testimony that with the licensed  
11 operators, we did not have the luxury of being able to stop  
12 the program, come in and do all of these analyses, and then  
13 start fresh the way we might had the plant not been operating  
14 at the time, and had there not been a need to maintain the  
15 licenses of the individuals who were involved both in operating  
16 the plant and in instructing the operators.

17 MS. BAUSER: I have no other questions.

18 MR. JORDAN: I am not in a position to cross  
19 on that at this point, for the reasons we have discussed,  
20 but I do have two other questions.

21 RECROSS EXAMINATION

22 BY MR. JORDAN:

23 Q First, you referred to the IMPO program guidelines  
24 -- wait a minute. The IMPO formal job task analysis you  
25 discussed. You said the formal job task analysis had not

XX INDEX

1 progressed far enough for them to have been taken into account  
2 in the IMPO guidelines.

3 A (Witness Knief) In the first issue of the IMPO  
4 guidelines. The one that we first compared to our program.  
5 My understanding is that the IMPO job task analysis had not  
6 progressed far enough to have been a significant input to it.

7 Q And that is the guideline you discuss in the first  
8 full paragraph on page 8?

9 A That is correct. The guidelines that were initially  
10 called benchmarks of excellence.

11 Q I may have made this more complicated than  
12 necessary. I believe that in your discussion with Ms. Wagner  
13 you several times referred to the formal JTAs hadn't progressed  
14 far enough, et cetera. You were at that point referring to  
15 the formal JTAs done by IMPO, not any that might have been  
16 done by someone else?

17 A That is correct.

18 Q And when were these guidelines issued, as you  
19 referred to them on page 8?

20 A I believe that that was either late 1980, or very  
21 early 1981. It was about the same time that we were doing  
22 the questionnaires for the operators.

23 Q It also sounds like it was about the same time that  
24 NUREG CR 1750 came out?

25 A Quite likely.

1 MR. JORDAN: That is all.

2 JUDGE SMITH: So you are reserving cross examination  
3 now.

4 MR. JORDAN: Yes, sir.

5 JUDGE SMITH: What is the status?

6 MS. BAUSER: I understood, Judge Smith, that if  
7 in going back and discussing with Dr. Regan the clarification  
8 of their testimony which precipitated Dr. Regan's comment,  
9 Mr. Jordan feels it is necessary to ask him something else  
10 about that clarification, that I would bring back these two  
11 witnesses so that he would have that opportunity.

12 I don't intend other aspects of cross to be held  
13 over; other than that limited point, I think we are through  
14 with this panel.

15 JUDGE SMITH: I -- that is what I heard you say,  
16 but I heard something different from him, and that is he  
17 cannot undertake any cross examination now, but you agree  
18 with her statement?

19 MR. JORDAN: She agrees with me. Within the  
20 point of the new testimony, that is what we are talking about.  
21 That is it. No more. I am not going to ask them about IMPO  
22 guidelines again. Or something like that.

23 JUDGE SMITH: At least -- Mr. Au?

24 MR. AU: No questions.

25 MS. WAGNER: No questions.

1 JUDGE SMITH: All right, gentlemen. You are  
2 excused.

3 MR JORDAN: Subject to recall .

4 JUDGE SMITH: Subject to recall.

5 (WITNESSES TEMPORARILY STAND ASIDE)

6 MS. BAUSER: Judge Smith, Licensee did not --  
7 Mr. Ross is at the simulator, and Licensee did not think  
8 this morning that we would get to the redirect of that  
9 panel, which I believe is all that we have left at this  
10 point, other than the possibility of this one follow-up.

11 MS. WAGNER: I think we also have some recross  
12 by the staff.

13 MS. BAUSER: Okay. I think Licensee has done  
14 its redirect, and we are on recross now of that panel, but  
15 I simply can't provide them today because of unavailability.

16 Other than that, Licensee has -- there are no  
17 other witnesses.

18 JUDGE SMITH: All right. Now, we have the Motion,  
19 and this would be the last opportunity we have to discuss  
20 any changes in -- in answer schedule. Whether we should have  
21 an accelerated answer schedule, or allow the regular times.

22 It is my view that -- I guess there is latitude,  
23 because we will finish this phase of the hearing next week.  
24 And in any event, I have no justification -- I would have no  
25 justification for suspending that hearing until answers,

1 -- responses are filed, and I have had an opportunity to  
2 consider them.

3 I don't think I am at liberty to suspend the  
4 hearing. Therefore, I think we should schedule the hearing  
5 for next week.

6 We have learned now that Wednesday is not  
7 available.

8 MR. GOLDBERG: Well, there is a Commission meeting  
9 at 2:00 on -- TMI -- Commission meeting at 2:00 on Wednesday.

10 JUDGE SMITH: And the parties obviously want to  
11 attend that.

12 End 7.  
13 SueT fols.

14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

#8-1-SueT

1 MR. BLAKE: Yes. I think if I -- I don't think  
2 we have to make the choice, or make a major choice here, I  
3 think because there is so very little remaining in order to  
4 complete this record that all the parties would agree that it  
5 comfortably can be accomplished in one day's time.

6 My clear preference would be to set it on  
7 Thursday next week. Be here at 10 o'clock if no one has  
8 any complications, and I certainly anticipate that that would  
9 be the only day that would be necessary.

10 I don't think we have to make the choice.

11 JUDGE SMITH: Do you agree?

12 MR. JORDAN: Yes, sir, I do.

13 JUDGE SMITH: Mr. Au?

14 MR. AU: Yes, sir.

15 MS. WAGNER: That's fine with the Staff.

16 JUDGE SMITH: Okay.

17 MR. BLAKE: Ms. Doroshaw, are you able to speak  
18 to --

19 MS. DOROSHAW: Yes, I can speak to that point.  
20 That is satisfactory with us.

21 JUDGE SMITH: And, of course, we don't foreclose  
22 the possibility of going over to Friday.

23 MR. BLAKE: No, that's right. I didn't mean to  
24 foreclose it. I think what we have is an expression of  
25 confidence I think that we will finish on Thursday.

#8-2-SueT

1 JUDGE SMITH: Even so, it -- even though it  
2 does seem that we will conclude this phase of the hearing  
3 before even other expedited Answer and Response schedule  
4 the parties could address the motion and I could consider it,  
5 I still think that it should be expedited. So, I will listen  
6 to the pleasure of the parties.

7 Bearing in mind there will be another motion  
8 on Monday. Is that still the schedule?

9 MS. DOROSHAW: That's correct.

10 JUDGE SMITH: I think it might be easier if --  
11 would the parties prefer perhaps to address both motions  
12 in one document?

13 MR. GOLDBERG: Either in one document or at  
14 the same time.

15 JUDGE SMITH: And I understand UCS may be filing  
16 a motion, too?

17 MR. JORDAN: Yes, sir, in which case we would do  
18 it I hope on Monday.

19 JUDGE SMITH: I think it would be -- it is very  
20 desirable that the Answers and any Responses be addressed to  
21 all three motions. One may impact upon another, and --

22 MR. BLAKE: I would like to make the following  
23 suggestion, that if TMIA and UCS will provide us with hand  
24 delivery of the motion, as the Commonwealth did today with  
25 courtesy copy, and if that occurs on Monday or in any event,

#8-3-SueT 1 with the service of the latest of the three motions an  
2 indication that that's all the motions we are going to get,  
3 then I would be prepared for Licensee to respond within ten  
4 days rather than the fifteen which we have under the Commis-  
5 sion's Rules for a written motion.

6 JUDGE SMITH: I was hoping that you wouldn't need  
7 that much time.

8 MR. BLAKE: As I sit here today, Judge Smith,  
9 I am reluctant without seeing the other motions yet to make  
10 a greater commitment than that on time.

11 JUDGE SMITH: That's true. What is your view,  
12 Mr. Goldberg?

13 MR. GOLDBERG: Well, I think that if the Licensee  
14 needs -- can file their response earlier than ten days after  
15 the service of the last of the motions, then I see no reason  
16 why they wouldn't file as soon as possible, we would like  
17 five days after Licensee files. And I'm certain they will  
18 hand-deliver us their response.

19 And if we can file sooner than that, we will.  
20 But that doesn't leave us very much time to consider their  
21 views.

22 I assume also then to the extent that there are  
23 responses of the Intervenors to the other motions that we  
24 would have those hand-delivered also, and five days from  
25 receipt of those.

#8-4-SueT

1 JUDGE SMITH: That's another problem.

2 MR. BLAKE: We've got a whale of a complication  
3 here with several different motions and unless the Intervenors  
4 are taking the position, as will be the Commonwealth, if their  
5 position on this subject is stated in their motion and we  
6 won't see subsequent responses to each of the other motions  
7 on the same subject, then we have another complication on the  
8 schedule.

9 I don't know whether they are willing to do that,  
10 or to say that.

11 JUDGE SMITH: That is a problem. If, for example,  
12 TMIA answers Commonwealth's motion in ten days, in support  
13 of the Commonwealth's motion, offering new arguments not  
14 contained there then it adds yet another cycle to the process,  
15 because other parties would have to address that.

16 And I don't know what to do about that except to  
17 let the parties know that if you do do that you will delay  
18 consideration, and there is a very, very strong expressed  
19 policy in all decisions on this subject that these motions be  
20 handled very, very promptly.

21 MR. AU: I think we can exercise some constraint,  
22 in that we won't, you know, try to duplicate or add anything  
23 that will delay the decision.

24 MS. DOROSHAW: We don't expect to do that either.  
25 Of course, we haven't read the Commonwealth's motion yet, but

#8-5-SueT

1 it's not our intention at this point to respond to that  
2 motion. We will attempt to put all of our arguments into  
3 one motion which will be filed Monday morning.

4 JUDGE SMITH: There is no use borrowing trouble.  
5 If I should see that type of a response and it raises new  
6 information, new grounds and new arguments, and I feel that  
7 other parties should have an opportunity to respond to that,  
8 well, we will make an Order at that time addressed to the need.

9 Okay. Then, one last point. As I stated, without  
10 hearing from the movant and -- the movants, what I don't see  
11 how I can act before our hearing resumes next week. I should  
12 have heard you argue to the contrary. If you wish to make  
13 such argument, any of you --

14 MR. BLAKE: I read nothing, Judge Smith, in the  
15 Commonwealth's pleading, and I guess I would like to hear from  
16 the other parties who are considering such a motion, but  
17 certainly I see nothing in there that would -- with the  
18 rather huge expenditure all of us have in this process of  
19 not going forward and doing another half day next week in  
20 order to wrap it up, however this comes out in the end.

21 And I guess I would like to hear from Mr. Au  
22 if has any different view. That was not the Commonwealth's  
23 intent, I think, that it was to stop this one half day short  
24 of the process.

25 MR. AU: Yes, I do have an argument to make on

#8-6-SueT 1 that.

2 JUDGE SMITH: No objection?

3 MR. AU: Pardon me?

4 JUDGE SMITH: No objection?

5 MR. AU: I think it's a difficult balancing  
6 question. We recognize, you know, effort that is being put  
7 forth in preparing this record. And we see the possibility  
8 that if you, Judge Smith, should decide to excuse yourself  
9 that this Board can continue. You have an alternate chairman,  
10 you have a record before you, and that it is possible to  
11 decide the issues remanded for this Board without your  
12 participation.

13 As far as your observing the demeanor and testi-  
14 mony of the witnesses next Thursday, I'm not sure that that  
15 is an important consideration. I think we are talking really  
16 about factual testimony and about the operation of the program.

17 So, I guess I'm saying that it's possible to  
18 go forward to hear that testimony without your participation.

19 JUDGE SMITH: All right. Does anyone else want  
20 to comment?

21 MR. JORDAN: Your Honor, we would have no  
22 objection to continuing and finishing on next Thursday.

23 MS. DOROSHAW: TMI Alert does not have a position  
24 on that at this time.

25 JUDGE SMITH: Okay. All right. So we are adjourned

#8-7-SueT

1 then until --

2 MR. GOLDBERG: I just want to raise -- make a  
3 suggestion. I think it might make sense to have a conference  
4 call after the receipt of the other motions to disqualify  
5 for the purpose of determining dates for all Responses, all  
6 Answers, whether there are other Intervenor or Licensee,  
7 and then for the Staff's Answer.

8 And my reason for suggesting that is twofold.  
9 First, as was explained no one knows what arguments might  
10 be in the other motions and how much time it might require,  
11 and whether the Intervenors might want to respond to the  
12 other Intervenors motions.

13 Secondly, although I have no knowledge on this,  
14 I would not be surprised to see the Aamodts, who are not here,  
15 file an Answer; and putting aside whether they have standing  
16 to even be heard on the motions, I would like them included  
17 in the conference call so that they are aware of whatever  
18 dates are set for all Answers to the motion.

19 I hate to see us Answer this and think we have  
20 everything and then, as has been the case in the past, to have  
21 another one come in that would require a response which not  
22 only might include arguments on standing but to protect the  
23 positions of the parties to go again into the merits.

24 JUDGE SMITH: It's not easy to set up a conference  
25 call as you describe. I don't know if it can be done.

#8-8-SueT

1 I see the utility of it, Mr. Goldberg, but it  
2 is very, very difficult to set up such a conference call.  
3 And I don't know. I just don't know. I don't want to commit  
4 to one if it can't be done.

5 Judge Wolfe suggested that perhaps you would like  
6 to volunteer in setting up such a call.

7 (Laughter.)

8 MR. GOLDBERG: I know how difficult it is to  
9 set up conference calls. I'm willing to --

10 JUDGE SMITH: If I see the need for a conference  
11 call we will try to set it up if possible. And it may very  
12 well be -- such a conference call would simply be a scheduling  
13 matter and not anything else. It could be that serial, you  
14 know, bilateral telephone calls would accomplish the same  
15 thing.

16 So, let's see what happens. All right. If  
17 there is nothing further we will adjourn. We will reconvene  
18 at 10 o'clock on Thursday here.

19 (Whereupon, the hearing is adjourned at 11:38 a.m.,  
20 Friday, January 11, 1985, to reconvene at 10:00 a.m.,  
21 Thursday, January 17, 1985.)

22 \* \* \* \* \*

23 ENDDDDDD

24

25

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING: Metropolitan Edison Company  
TMI Nuclear Station, Unit 1

DOCKET NO.: NRC 50-289-SP

PLACE: Harrisburg, PA

DATE: Friday, January 11, 1985

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission.

(sig)

(TYPED)

*Garrett J. Walsh, Jr.*  
GARRETT J. WALSH, JR.

Official Reporter

Reporter's Affiliation

Ace-Federal Reporters, Inc.

\_\_\_\_\_  
MARY SIMONS

Official Reporter

Ace-Federal Reporters, Inc.

*Myrtle H. Traylor*  
MYRTLE H. TRAYLOR

Official Reporter

Ace-Federal Reporters, Inc.