

ORIGINAL

OFFICIAL TRANSCRIPT
PROCEEDINGS BEFORE

NUCLEAR REGULATORY COMMISSION
THE ATOMIC SAFETY AND LICENSING BOARD

DKT/CASE NO. 50-454 OL & 50-455 OL

TITLE COMMONWEALTH EDISON COMPANY
(Byron Nuclear Power Station, Units 1 & 2)

PLACE Rockford, Illinois

DATE March 8, 1983

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1
2 UNITED STATES OF AMERICA
3 NUCLEAR REGULATORY COMMISSION
4 BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

5 -----x
6 In the Matter of: : Docket Nos.:
7 COMMONWEALTH EDISON COMPANY : 50-454 OL
8 (Byron Nuclear Power Station Unit 1) :
9 COMMONWEALTH EDISON COMPANY : 50-455 OL
10 (Byron Nuclear Power Station Unit 2) :
11 -----x

12 United States District Courthouse
13 211 South Court Street
14 Rockford, Illinois

15 March 8, 1983

16 The hearing in the above-entitled matter
17 convened, pursuant to notice, at 9:00 A. M.

18 BEFORE:

19 IVAN W. SMITH,
20 Administrative Law Judge

21 DIXON A. CALLIHAN,
22 Administrative Judge

23 RICHARD F. COLE,
24 Administrative Judge

25 APPEARANCES:

On behalf of Licensee, Commonwealth Edison
Company:

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Chicago, Illinois 60602

4 On behalf of Nuclear Regulatory Commission
5 Staff:

6 STEVEN GOLDBERG, Esq.
7 RICHARD RAWSON, Esq.

8 On behalf of the Intervenors:

9 BRYAN SAVAGE, Esq.
10 DAVID THOMAS, Esq.

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C O N T E N T S

WITNESSES: DIRECT CROSS REDIRECT RECROSS BOARD

3	Frank Rescek			
4	By Mr. Miller	1155		
4	By Mr. Thomas		1160	
5	By Judge Cole			1181
5	By Judge Smith			1193
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8	By Mr. Rawson	1242		
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12	Lawrence Conway			
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15	Jerome Roulo			
15	By Ms. Herrin	1355		
16	By Mr. Thomas		1357	

RECESSES:

Morning - 1157
 Afternoon - 1305

1 JUDGE SMITH: Good morning.

2 Are there any preliminary matters?

3 MR. GALLO: Judge Smith, we have been discussing
4 among the parties the problem that Mrs. Johnson has
5 presented -- not presented, but raised, due to the fact
6 that Mr. Bridenbaugh, her witness in connection with steam
7 generator tube integrity contentions, was suddenly taken
8 ill and had to go into the hospital for an operation and,
9 therefore, is unavailable to participate during the normal
10 time that that issue was scheduled; namely, beginning with
11 next Monday, on March 14th.

12 In an effort to accommodate this situation,
13 Commonwealth Edison is agreeable -- and I think we have
14 general agreement among the other parties -- to put over
15 the steam generator tube issue until the week beginning
16 April 11th.

17 That was the week that was otherwise set aside for
18 the QA issue, and the QA issue would necessarily be moved,
19 because of that action, to March 28th. That, in turn,
20 would bump the issue that was scheduled for March 28th,
21 which was the Class 9 Contention and the hydrology or
22 liquid pathway contention. We would propose that those
23 two issues -- let me rephrase that.

24 We would propose that the Class 9 issue go forward
25 next Monday, and right now there is some uncertainty on

1 the availability of witnesses with respect to the liquid
2 pathway issue, and we are trying to firm that up to maybe
3 also add that issue next week; but, in any event, we are
4 prepared at this time to put over the steam generator tube
5 issue until April 11th, move the issue scheduled for that
6 time to the 28th of March -- that would be the QA issue --
7 and then move the Class 9 issue to next Monday.

8 JUDGE SMITH: Okay. We elected to inform the
9 parties that the conflict that we have previously had
10 prevented hearings on the week of April 4th has been
11 resolved and we can have hearings.

12 On the other hand, we have also called upon our
13 collective experiences and we recognize that the week of
14 March 27th, beginning the week of March 28th, creates a
15 great deal of difficulties conducting hearings because
16 there are several religious holidays during that week; and
17 we were hoping that things might work out so that we would
18 not have to be constantly juggling schedules on that
19 account.

20 Of course, I may be borrowing trouble, but it has
21 happened many times before that those holidays do disrupt
22 hearings.

23 MR. GALLO: Well, being sensitive to that point,
24 would it be acceptable to all concerned to move the QA
25 issue to April 4th?

1 MR. GOLDBERG: Judge, I don't know. We have
2 agonized over trying to accommodate other scheduling
3 constraints that the other parties have, and there is
4 going to be a limit to witness flexibility and
5 availability above and beyond what we have already planned
6 in the schedule, so I would like to add here to the
7 scheduling sessions that we assign right now and try and
8 see if we can accommodate, within the existing time frame,
9 the hydrology issue.

10 MR. THOMAS: Judge, Jane Whicher is the attorney
11 who is representing the League with regard to the QA
12 issue.

13 She has checked with her witnesses for the week of
14 the 28th, and as far as we know now, the witnesses are
15 available.

16 Apropos of what Mr. Goldberg was saying, I would be
17 loathe at this time to change that issue to April 4th and
18 have her have to go back and check with her witnesses
19 again.

20 JUDGE SMITH: This is very optimistic planning.

21 I myself have never been involved in a proceeding in
22 which you could look so far down the road and make
23 appointments with the Court, you know, for bringing a
24 witness in.

25 I commend you for your optimism, and so far you have

1 done pretty well; but I don't know how well you are going
2 to be able to continue.

3 MR. THOMAS: You are right. It may be overly
4 optimistic, but none of us are left with any choice but to
5 try to schedule through the middle of April.

6 All I am saying is she has already cleared or is
7 very close to clearing the week of March 28th, and now to
8 change and start over again on the week of April 4th I
9 think is just asking for problems, which we are not faced
10 with at this very moment.

11 JUDGE SMITH: Are these local witnesses?

12 MR. MILLER: Yes, they are. They are all local
13 people.

14 MS. JOHNSON: No, no.

15 MR. THOMAS: One of them, I believe, is from out
16 of state or out of town.

17 JUDGE SMITH: As you know, many forums require
18 all witnesses to be present at the beginning of the
19 hearing and they sit and sit and sit. We don't do that;
20 but --

21 MR. GALLO: Judge Smith, I am sorry; I didn't
22 mean to interrupt, but the Staff has indicated some
23 problems of shifting dates, Mr. Thomas has.

24 I can tell you that it's been excruciating getting
25 this much agreement, and to shift it again in the face of

1 their mild objections, I would say let's not try to do
2 that.

3 The real problem here is Bridenbaugh is not
4 available.

5 We are scheduled to go forward next Monday. I have
6 got nine witnesses on the issue waiting to hear from me as
7 to whether or not they should come out Sunday in order to
8 be prepared for this hearing.

9 Either we go forward and deprive the Intervenor of
10 their main key witness or we try to do the best we can and
11 set it over.

12 JUDGE SMITH: Maybe I am trying to accomplish
13 too much here.

14 Let's take it one at a time. Let's take your
15 particular point of the --

16 MR. THOMAS: Steam generator.

17 JUDGE SMITH: -- steam generator, yes.

18 MR. THOMAS: Our witness on steam generator, we
19 were notified last Wednesday night, actually, while we
20 were here in the hearing, that he has to go into the
21 hospital, a problem with his throat, to have something
22 removed from his throat. It's an emergency situation.

23 JUDGE SMITH: This is Bridenbaugh?

24 MR. THOMAS: Yes, this is Bridenbaugh.

25 So he cannot not be here next week, the 14th, when

1 that issue was supposed to go ahead.

2 Right, the Applicant has a number of witnesses.
3 Bridenbaugh is our only witness, and, therefore, you know,
4 particularly important for that reason.

5 Now, he is not going to be able to talk for two
6 weeks after this operation, and that's why we have to
7 reschedule the steam generator.

8 JUDGE SMITH: I am not questioning that. I am
9 challenging. I see the need for that.

10 MR. THOMAS: Okay.

11 JUDGE SMITH: My critical comments were
12 addressed to the inflexibility which was being
13 demonstrated as we try to accommodate this problem.

14 MR. THOMAS: Well, what is the --

15 JUDGE SMITH: What is the specific proposal now?

16 MR. THOMAS: The proposal is to change steam
17 generators from next week to April 11th, which was the
18 week which was scheduled for QA/QC.

19 Now, we checked this out with Jane Whicher and the
20 other parties last week and it looks at this point as
21 though QA/QC could be moved to the week of March 28th,
22 which was the week for Class 9 and hydrology. We would
23 then -- we think we can move Class 9 and hydrology to next
24 week, when we were scheduled to do steam generators, at
25 least part of it.

1 The Staff cannot -- we would not be able to complete
2 the hydrology next week, perhaps, but we would be able to,
3 I think, get the lion's share in. We would basically be
4 able to get in a week of work; and I think that schedule,
5 if it's convenient with the Board, would optimize the time
6 and conclude the hearings by the date that were originally
7 set to conclude them, being the middle of April; if it's
8 okay with the Board, of course.

9 JUDGE SMITH: How about our concern about the
10 religious holidays on the 28th?

11 We have both -- this year we have -- both Passover
12 and Good Friday falls within that week, and as far as the
13 Board is concerned, we don't have any problem; but there
14 are a lot of witnesses who are involved, and that might or
15 could create a problem. These are the holidays of the
16 year which are among the top two or three, which is likely
17 to cause disruption.

18 MR. THOMAS: I understand, Judge.

19 Had we known last week the week of April 4th was
20 available, maybe we could have aimed for that week; but
21 the point is, I think, we have cleared that week with our
22 witnesses, so I think it's a little late for them to be
23 raising that issue now.

24 MR. MILLER: I don't understand that, I guess.

25 It seems to me we are almost a month before April

1 4th. At least inquire as to whether that is feasible. I
2 think there are numbers -- I think we have something like
3 nine quality assurance witnesses, the Staff has a panel.

4 MR. GOLDBERG: Six, I think.

5 MR. MILLER: There are three witnesses for the
6 Intervenors.

7 If we are going to have concerns about other
8 commitments, which may be understandable in view of the
9 religious holidays that week, and have a short week for
10 one reason or another, I would really prefer to see if we
11 can't do it on the 4th, at least inquire. I mean it's a
12 question of three phone calls for the Intervenors.

13 JUDGE SMITH: Your suggestion --

14 MR. THOMAS: Do you have a problem?

15 MR. MILLER: We are just checking with our
16 witnesses right now on the 28th. I committed to it
17 without even talking to them. So I am assuming that there
18 is no problem.

19 MR. GOLDBERG: If there is no problem -- I think
20 we already know there is no problem for us, and I would
21 rather not confound the problem by advancing alternative
22 weeks.

23 JUDGE SMITH: Well, all right.

24 Since we have pointed out the potential for the
25 problem, as far as the Board is concerned, we don't have a

1 problem; but it would be up to the parties now to find out
2 quickly whether they have a problem or there is a problem.

3 I -- if all the people that are involved -- well,
4 you find out.

5 In any event, that schedule would anticipate, as we
6 have anticipated, that the week of the 4th be taken out of
7 the hearings; and I think we still need -- for other
8 conflicts, we will still need that week or the week
9 before, I mean, the Board; and I am sure that some of the
10 parties could probably use some time to regroup and get
11 ready for the rest of the hearing, too; but we would still
12 adhere to the original plan of taking that week off.

13 MR. THOMAS: The week of the 4th?

14 JUDGE SMITH: Yes, under the schedule proposed.

15 MR. THOMAS: Okay, okay.

16 MR. GALLO: Do we have the Board's approval,
17 then, to shift the issues as described by Mr. Thomas?

18 JUDGE SMITH: Yes, tentatively, being sensitive
19 to Mr. Miller's point, that religious holiday conflict has
20 not been considered, but that would be it unless somebody
21 comes back to the Board.

22 MR. GALLO: Thank you.

23 MR. THOMAS: Thank you, Judge.

24 JUDGE SMITH: Did somebody else -- Mr. Campbell,
25 did --

1 MR. CAMPBELL: No. I have a letter again that
2 we were -- just give it to the reporter?

3 JUDGE SMITH: No. I take those.

4 MR. CAMPBELL: Thank you.

5 MR. MILLER: Judge Smith, one other preliminary
6 matter.

7 I think I would like to report to the Board that the
8 parties continued to meet yesterday evening with respect
9 to resolving the emergency planning issue.

10 There is really no progress to report, but I would
11 expect that we will have a definitive answer with respect
12 to whether we have agreed, whether we failed to agree or
13 whether we need some further mediation by the Board by the
14 end of the hearing session today.

15 I also find that I probably have neglected to
16 disclose the order of Commonwealth Edison Company's ALARA
17 witnesses.

18 JUDGE SMITH: Mr. Gallo, I believe, did.

19 MR. MILLER: Did you?

20 MR. GALLO: Yes.

21 MR. MILLER: Thank you.

22 MR. GALLO: I did something.

23 JUDGE SMITH: We will start with Mr. Van Laere --
24 No. Then you switched.

25 MR. MILLER: Rescek.

1 JUDGE SMITH: Rescek begins, yes.

2 We thought that perhaps Van Laere and Rescek could
3 have come on as a panel rather than --

4 MR. MILLER: Well, Mr. Van Laere is present in
5 the hearing room. I have no objection to that.

6 There is some overlap between their testimony,
7 although Mr. Rescek deals with the corporate ALARA
8 program, Mr. Van Laere is the station.

9 JUDGE SMITH: It doesn't really matter.

10 MR. THOMAS: Judge, I think we would prefer to
11 do them individually, as we were planning. That's what we
12 were planning on doing.

13 JUDGE SMITH: Okay. That means I do not have --
14 I have Mr. Rescek's testimony, but there was a great deal
15 of attachments which are back in --

16 MR. MILLER: Let me supply the Board.
17 Do each of you need another copy of Mr. Rescek's?

18 JUDGE SMITH: I have mine handy.

19 Will they come up right away?

20 MR. MILLER: Sure.

21 JUDGE SMITH: If they do -- well, I am engaged
22 in a paper disposal program, and you seem to be adding to
23 it.

24 (Laughter.)

25 MR. MILLER: There are three attachments to his

1 testimony.

2 JUDGE SMITH: We already have these?

3 MR. MILLER: Yes. I believe these are in the
4 form as they were distributed to the Board, sir.

5 JUDGE SMITH: That was the form, yes.

6 Mr. Rescek, may I administer the oath, please?

7 MR. MILLER: Would you stand up, please.

8 (The witness was thereupon duly sworn.)

9 FRANK RESCEK

10 called as a witness by counsel for Applicant, having first
11 been duly sworn by the Chairman, was examined and
12 testified as

13 follows:

14 DIRECT EXAMINATION

15 BY MR. MILLER

16 Q Would you state your name, please?

17 A Frank Rescek.

18 Q By whom are you employed, Mr. Rescek?

19 A Commonwealth Edison.

20 Q Do you have before you a document which is entitled,
21 "Testimony of Frank Rescek," consisting of 27 pages, and
22 three attachments, which are entitled, "Commonwealth
23 Edison Company Radiation Protection Standards, February
24 28, 1982," identified as Rescek Exhibit 1; "Commonwealth
25 Edison Company Policy and Procedures For Maintaining

1 Occupational Radiation Exposures As Low As Is Reasonably
2 Achievable," which is marked as Rescek Exhibit 2; and the
3 document entitled, "Instructor's Guide For Nuclear General
4 Employee Training, (N-GET)," which is marked as Rescek
5 Exhibit 3?

6 A Yes, I do.

7 Q Calling your attention to the document that's titled,
8 "Testimony of Frank Rescek," by whom was that document
9 prepared, Mr. Rescek?

10 A By myself.

11 Q Is it true and correct?

12 A Yes, it is.

13 Q Are there any changes or corrections that you wish to make
14 to that document?

15 A No.

16 MR. MILLER: Judge Smith, I ask that Mr.
17 Rescek's prepared testimony be bound into the record as if
18 read.

19 We haven't, I don't believe, established any system
20 for binding in exhibits.

21 I would also ask that Rescek's Exhibits 1, 2 and 3,
22 which are identified in Mr. Rescek's prepared testimony,
23 be admitted into evidence as well.

24 JUDGE SMITH: As an exhibit?

25 MR. MILLER: Yes, your Honor.

1 JUDGE SMITH: Are there any objections?

2 MR. THOMAS: No objections.

3 JUDGE SMITH: The testimony is received and
4 bound into the transcript as if read.

5 (The document referred to, the prepared
6 testimony of Frank Rescek, received in
7 evidence, follows:)

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Occupational Exposure/ALARA
Contentions 42, 111, 112

- Rescek Testimony -

OUTLINE OF FRANK RESCEK'S TESTIMONY
ON
CONTENTIONS 42, 111 AND 112

- I. Frank Rescek is the Lead Health Physics - Technical Service Engineer of Commonwealth Edison Company.
- II. In his testimony, Mr. Rescek will discuss the following:
 - A. Edison's corporate ALARA program;
 - B. Edison's dosimetry program;
 - C. Edison's recordkeeping procedures; and
 - D. Edison's training program.
- III. Edison's corporate ALARA program:
 - A. The purpose of Edison's ALARA program is to minimize the radiation dose received by both an individual nuclear station worker and all workers as a whole.
 - B. Edison's program is based on the linear, no-threshold hypothesis and therefore assumes that the potential harmful health effects from radiation exposure can be reduced by reducing total dose.
 - C. Edison maintains radiation protection standards that provide guidelines on how to keep occupational radiation exposures ALARA.
 - D. Edison's ALARA Manual defines the organization of the ALARA committees and provides guidance on dose reduction techniques.
- IV. Edison's dosimetry program is designed to accurately assess the dose equivalent received by each individual. Edison's program includes the following:
 - A. Personal neutron dosimeters with CR-39, REM-meters, TLDs to monitor extremity dose, and pocket ionization chambers all are used to monitor dose equivalents.
 - B. "Spiked" badges are routinely submitted to the independent vendor and the vendor's results are compared to the known exposures; and

- C. Edison takes surveys of controlled areas before a person is permitted to enter.

- V. Edison's recordkeeping program:
 - A. The management of the dosimetry records is the responsibility of each nuclear station's lead health physicist.
 - B. Edison keeps records of radiation exposures of individuals and results of surveys, monitoring, and disposals.
 - C. Edison maintains the following information for each worker at a nuclear station:
 - 1. Data from the processed film badges and the personal ionization chambers;
 - 2. The estimated current exposure status for all personnel by work group;
 - 3. Information from each worker's NRC Form-4 and NRC Form-5.

- VI. Edison's radiation evaluation program is a computer based occupational exposure accounting system used to document dose expenditures by work group.

- VII. Edison's benefit/cost evaluation program produces information which allows station personnel to evaluate the potential benefits of dose reduction actions in general.

- VIII. Edison's nuclear employee training program:
 - A. All workers are instructed on fundamentals of radiation exposure, the importance of maintaining doses ALARA, and their role in accomplishing that objective.
 - B. Edison's training program is outlined in the nuclear - general employee training manual ("N-GET").
 - C. All workers, both Edison employees and contract workers, receive the N-GET training.

- IX. Edison's policy on contract workers:
- A. All contract workers receive the same training as an Edison employee, including training on safety equipment.
 - B. Edison will retain contract workers for the following reasons:
 - 1. As a permanent contractor to do a specific job;
 - 2. As a temporary worker who has a specialized skill which is needed;
 - 3. To supplement the number of Edison employees so that each worker's dose is maintained well under the regulatory limits.
 - C. Edison uses the same dosimetry monitoring program for both contract workers and employees.
 - D. Edison uses an occupational dose history and its monitoring programs to make sure that each contract worker's dose does not exceed the regulatory limits.
- X. Edison's policy is to limit the radiation exposure to any declared pregnant women to 500 millirem over her gestation period.
- XI. All of the procedures outlined above perform a comprehensive program that will keep radiation doses as low as is reasonable achievable.

TESTIMONY OF FRANK RESCEK

1. Q. State your name and occupation.

A. My name is Frank Rescek. I am the Lead Health Physics - Technical Services Engineer of Commonwealth Edison Company ("Edison").

2. Q. Briefly describe your education, dates of degrees received, professional experience, and professional societies.

A. In 1976, I received a Master of Science degree in radiological health from the University of Michigan and in 1974, I received a Bachelor of Science degree in biology from Kent State University. From May of 1976 until November of 1977, I was a health physicist at Edison's corporate offices. From November of 1977 until May of 1978, I was a health physicist at Edison's Zion nuclear generating station. From June of 1978 until May of 1982, I was the lead health physicist at Zion. I have held my current position since May of 1982. I am a member of the Health Physics Society, both the National Chapter and the Midwest Chapter. I also am a member of the Reactor Safeguards Committee for the Zion Westinghouse Training Reactor. I am a Certified Power Reactor Health Physicist as certified by the American Board of Health Physics.

3. Q. What is the scope and purpose of your testimony?
- A. The scope and purpose of my testimony is to respond to those portions of Contentions 42, 111, and 112 of the Rockford League of Women Voters that involve Edison's corporate policies or procedures. Contention 42 generally claims that Byron cannot be operated so that proper radiation exposure levels to employees and workers are maintained. Contention 111 asserts that Byron's in-plant monitoring program is inadequate and that Byron's design basis will not keep radiation exposure levels as low as is reasonably achievable ("ALARA"). Contention 112 generally asserts that Edison has not accurately assessed the effects of radiation exposure on workers at Byron.

In general, my testimony will discuss Edison's corporate ALARA program, Edison's dosimetry program, Edison's procedures for keeping records on radiation doses and exposures, and Edison's training program for nuclear employees.

4. Q. What is the primary objective of Edison's ALARA program?
- A. Edison's ALARA program was designed to minimize both the radiation dose received by an individual worker at a nuclear power station and the sum of

doses received by all exposed workers. Keeping those doses as low as is reasonably achievable reduces the potential risks of adverse health effects from radiation exposure. To achieve this goal, Edison designs, operates, and maintains its nuclear generating stations so that radiation doses to station personnel are kept well below the legal limits and as low as is reasonably achievable.

5. Q. Why is it desirable to keep radiation doses ALARA?
- A. The ALARA program is based on the linear, no-threshold model for assessing potential risks from radiation dose. This model conservatively addresses the risks associated with radiation exposure. It shows the potential health risk to rise proportionately with increasing radiation dose and assumes that no dose threshold exists below which all risk is eliminated. As a consequence, the potential harmful health effects from radiation exposure can be reduced by reducing the total dose.
6. Q. What does Edison's corporate ALARA program consist of?

A. Edison's program to keep radiation exposures ALARA is divided into four basic parts. The first is a manual entitled "Policy and Procedures for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable (ALARA)". This manual established ALARA organizations at Edison nuclear stations and at the corporate level to coordinate ALARA activities. Edison also has a dosimetry program designed to provide careful and accurate monitoring of each person's dose equivalent. These occupational dose equivalents are carefully recorded through Edison's central computerized recordkeeping program which allows the stations to know what radiation dose each person has received. In addition, Edison's Radiation Evaluation Program documents the dose expenditure resulting from the work performed on various plant systems, components, and tasks. Finally, Edison has an extensive training program for nuclear personnel which includes instruction on how to keep personal exposures ALARA. All of these programs, together with the corporate ALARA Manual, the radiation protection standards, station design, careful preparation and review of station operating and

maintenance procedures, and review of equipment design to incorporate the results of station operating experience, constitute Edison's total ALARA program.

7. Q. Does Edison also maintain general radiation protection standards in addition to the Edison ALARA Manual?
- A. Yes. Edison maintains a separate manual of radiation protection standards that provides guidelines to assure that radiation exposures are kept below the limits of 10 CFR §20 and provides guidance and procedures that are designed to maintain occupational radiation exposures ALARA. The radiation protection standards augment the ALARA Manual in assuring that occupational exposures are maintained ALARA. These radiation protection standards address, however, the broad scope of Edison's radiation protection program and encompasses more than just the ALARA activities. A copy of Edison's radiation protection standards is attached to my testimony as Exhibit 1.
8. Q. Are you familiar with the Edison ALARA Manual?
- A. Yes. One of my responsibilities is to provide technical assistance to the ALARA coordinator, and

as such, I am required to be familiar with Edison's ALARA program and with the ALARA Manual.

9. Q. When did Edison adopt this Manual?
- A. Edison officially adopted the ALARA Manual in 1981. Before Edison adopted the ALARA manual, however, those ALARA activities were supervised by the health physics staff at each nuclear station.
10. Q. Is Exhibit 2 of this testimony the Edison ALARA Manual?
- A. Yes. That is the final version of the Manual.
11. Q. In general, what does the ALARA Manual contain?
- A. The ALARA Manual sets forth Edison's ALARA policy and defines the organizational structures of the ALARA committees including the responsibilities of each committee member as well as the committees' rules of operation. The ALARA Manual provides guidance on dose reduction techniques and on the level of dose reduction effort appropriate for a particular job. The Manual also provides the operating procedure for the benefit/cost computer program which is used to evaluate the potential benefits and costs of using various dose reduction techniques or actions. That is, the program helps

the user to determine if a proposed action to reduce workers' doses is "reasonably achievable". The Manual delineates the methods Edison personnel are to use to implement and document the results of the ALARA program. Specifically, the ALARA program has several forms that must be completed which formally document the results of ALARA activities and provide further information for use at all of Edison's nuclear stations.

12. Q. In your professional opinion, does the Edison ALARA Manual provide sufficient guidelines to keep radiation exposure to personnel as low as is reasonably achievable?

A. Yes. In my opinion, the ALARA manual provides adequate guidelines to maintain occupational radiation doses ALARA.

13. Q. What is the structure of Edison's ALARA organization?

A. The ALARA organization consists of a corporate and nuclear station ALARA review committees. The members of each of these committees include representatives from key functioning groups within the company such as the Operations, Maintenance,

Radiation-Chemistry, and Technical Support departments, in addition to a designated ALARA coordinator. The Corporate Committee has the responsibility to direct corporate ALARA activities, approve station ALARA goals, review overall performance, and report on the performance and effectiveness of the ALARA program to the Vice President of Nuclear Operations. The station committees are responsible for developing and monitoring the progress of station ALARA goals. These station committees must submit periodic progress reports to the Corporate Committee for review. All of these committees meet on a routine quarterly basis.

14. Q. Which person has primary responsibility over the implementation of the corporate ALARA program?
- A. The Technical-Services Nuclear ALARA Coordinator serves as the secretary of the Corporate ALARA Review Committee and has many significant responsibilities over the development of the corporate ALARA program. His responsibilities include: implementing the Radiation Evaluation Program for dose accounting and providing the necessary reports to station and corporate personnel; implementing the benefit/cost computer program, including the updating of the standard information used by the program; assisting in the training of station

personnel on using Edison's Radiation Evaluation Program and the benefit/cost program; verifying that the corporate ALARA program functions and provides documentation of dose reduction actions; reviewing the progress of stations towards their ALARA goals; providing technical assistance and guidance to the station ALARA coordinators; participating in design reviews of nuclear stations and design reviews of plant modifications that affect radiation exposure in existing stations; and reviewing exposure trends at the stations and identifying any problem areas. He also must periodically prepare reports to the corporate ALARA committee which give operational data for specific tasks to provide a basis for committee review and evaluation.

15. Q. What is the purpose of Edison's dosimetry program?

A. Edison's dosimetry program is designed to provide an accurate assessment of the dose equivalent received by an individual. This program is necessary not only to keep doses ALARA but also to comply with applicable regulations and to assure the protection of the health and safety of the workers.

16. Q. What are Edison's primary neutron monitoring devices?

- A. Edison uses a personal neutron dosimeter which contains CR-39, a neutron sensitive material, and which is processed by an independent vendor. This type of detector has a lower neutron energy threshold than NTA film and exhibits good stability over time.
17. Q. Does Edison use any other instruments to monitor neutron radiation?
- A. Yes. Edison also performs neutron monitoring with a calibrated REM-meter. REM-meters have a history of providing reliable measurements for the neutron energy spectrum at commercial nuclear power plants. A neutron dose is calculated for all workers who must enter a neutron radiation field based on the REM-meter measured dose rates and the time spent in the area. This calculated dose is used to augment the dose information obtained from the neutron dosimeter. The use of a calculated neutron dose equivalent to supplement the neutron dosimeter is consistent with the guidance given in NRC Regulatory Guide 8.14, "Personal Neutron Dosimeters."
18. Q. Does Edison use TLDs?
- A. Yes, Edison currently uses TLDs to monitor extremity dose. Edison also uses TLDs in its radiological environmental program. These TLDs are processed by a contract vendor.

19. Q. How does Edison monitor beta and gamma radiation doses to personnel?
- A. Edison contracts the services of a vendor to supply and process film badges which monitor both beta and gamma dose. They are processed on a biweekly basis and the results are given to Edison where they are entered into its computer system. In addition, all badged workers at the nuclear stations use pocket ionization chambers as a secondary dosimetry to the film badge. These pocket ionization chambers are read daily and the results are entered into the computer. Subsequently, a report is generated which provides an up-to-date dose status for all personnel by work group.
20. Q. How is the information from the film badges cross-checked with the pocket ionization chamber data?
- A. At the end of each biweekly period, the processed badge results are matched and compared with their corresponding pocket ionization chamber results. The film badge results are then recorded in each worker's permanent record of occupational dose. Significant discrepancies between the film badge results and the pocket ionization chamber readings are investigated to properly assess the individual's dose equivalent.

21. Q. Is the cross-checking with the pocket ionization chamber readings the only method Edison uses to ensure that the film badges had been processed correctly?

A. No. Each operating nuclear power station routinely submits "spiked" badges to the processor. "Spiked" badges are badges which have been exposed to known amounts of radiation in various ranges and are sent to the processor along with the personal film badges actually used. The processor's data on these spiked badges are then compared to the known exposures. Again, any discrepancies are investigated.

In addition, both Edison and the film badge processor for the station perform independent quality assurance tests on Edison's film badge program. The processor also performs a similar quality assurance check within its own company.

22. Q. Does Edison use any other methods to monitor radiation exposures to personnel?

A. Yes. Edison also monitors and controls exposures through survey information. Surveys of all controlled areas are performed by radiation protection specialists, using calibrated instruments, before a person is permitted to enter the area. This information, and any timekeeping data available,

can be used when investigating discrepancies between a film badge result and personal ionization chamber readings.

23. Q. Who is responsible for maintaining these dosimetry records?
- A. The management of the dosimetry records is the responsibility of each nuclear station's lead health physicist and his staff. They also have the responsibility of reviewing the daily log containing the personal ionization chamber readings each day and entering that data into the computer to update the workers' permanent dosimetry records. This information is reviewed before an individual is authorized to exceed the administrative daily dose limit. The management and control of the computer program is the responsibility of the corporate health physics staff. The corporate health physics staff also is responsible for program development and trending of occupational exposure data.
24. Q. What are these administrative daily dose limits?
- A. Edison has imposed an administrative daily dose limit on exposure to personnel of 50 millirem and an administrative weekly dose limit of 300 millirem.

Edison has established these administrative limits as a method of dose management. By using these administrative daily and weekly dose limits, Edison will be able to make sure that occupational doses are reasonably distributed among individuals within the same work group as well as keep workers' doses well below the legal limits during the calendar quarter and year. Thus, workers will always be available to perform work in radiation controlled areas throughout the year.

25. Q. What would happen if a worker was expected to exceed that administrative daily dose limit of 50 mrem?
- A. Before a worker would be authorized to exceed that limit, a Radiation Work Permit (RWP) would have to be prepared. The RWP incorporates survey data to provide detailed radiological information for a job, including a description of the work, survey results of the area, and manrem and manhour estimates for the job. Personal requirements detailing the protective clothing and dosimetry necessary for the job are included on each RWP. The RWP must be signed by the work group supervisor, the shift supervisor, and a representative of the health physics department before a worker is allowed to exceed the administrative daily dose limit. In no case would a worker be authorized to exceed any limit set by a NRC regulation in a non-emergency task.

26. Q. What other records does Edison maintain to ensure that radiation exposures are kept ALARA?
- A. Edison has developed a record-keeping program that complies with the requirements of 10 CFR §20.401. This includes maintaining records for radiation exposures of individuals and results of surveys, monitoring, and disposals. In addition, Edison must provide records to the NRC according to the requirements of Regulatory Guide 1.16 and 10 CFR §20.407.
27. Q. How are the responsibilities of maintaining these records divided among each nuclear station and the corporate offices?
- A. Each Edison nuclear station has the responsibility of monitoring and recording radiation doses received at the plant. The corporate Technical Services - Nuclear Group has the responsibility for coordinating the dosimetry program among all the nuclear stations, the computer system staff, the independent vendors who provide dosimetry services, and the data processing department.
28. Q. Does Edison's recordkeeping program include maintaining background information on radiation workers?
- A. Yes. Each radiation worker is required to complete an NRC Form-4 which details the worker's prior occupational dose history. This form also

serves as a registration for data entry into Edison's computer dosimetry system. In addition, each radiation worker is required to read the Privacy Act Statement provided on the reverse side of the form. This statement includes an explanation of what exposure data will be recorded and for what purposes it may be used.

29. Q. What information is recorded for each individual in the Edison computer dosimetry system?

A. The independent vendor who processes the film badges supplies Technical Services-Nuclear with the data collected from the processed badges. This information is recorded in the computer system. In addition, personal ionization chamber exposure data is transmitted daily to the central computer by a teleprocessing unit, and a report is generated which gives the estimated current exposure status for all personnel by work group. This estimated current exposure status is based on the latest film badge results and all daily personal ionization chamber and timekeeping data recorded since the issuance of the last processed film badge results. As stated previously, at the end of each biweekly exposure period, the processed film badges are compared with their corresponding

pocket ionization chamber dosimeters and a biweekly radiation exposure report is produced. Also, an NRC Form-5 is generated for each individual, and the dose data is recorded in accordance with 10 CFR §20. Specifically, the NRC Form-5 contains selected NRC Form-4 data along with the biweekly records of whole body, skin of whole body, and extremity dose data. In addition, the Form-5 contains results of direct (whole body counts) and indirect (urine and fecal samples) bioassays. This form also has space for commentary information which is pertinent to the worker's dose history.

30. Q. Does Edison have any other pertinent evaluation programs?
- A. Yes. Edison has a Radiation Evaluation Program and a benefit/cost evaluation program.
31. Q. What is the Radiation Evaluation Program?
- A. Since April of 1977, Edison has operated the Radiation Evaluation Program ("REP") which is a computer based occupational exposure accounting system used to document the dose expenditure by work group for work performed on various plant systems, components, and tasks. In addition to documenting each work group's exposure and the plant component worked on, the program records the

total work effort in person-hours and describes the work performed. The data is obtained from the individual station's records, including such records as work request forms, radiation work permits, radiation dose timekeeping data sheets, pocket dosimetry data sheets, and the foreman's work assignment sheets. The data from these documents is routinely entered into the REP computer data file by the Radiation-Chemistry Department at the station.

The REP produces routine quarterly reports which provide radiation dose totals by plant system, dose totals for systems by individual components, component dose histories, and a tabulation of jobs, if any, for which the collective dose exceeded 5 man-rem. In addition, the REP can generate special data summaries of radiation exposure by job when required.

32. Q. How does maintaining records of a worker's radiation exposure by job and component help Edison keep its exposures ALARA?
- A. Maintaining the above data helps radiation protection personnel do the following: (1) identify specific jobs and work areas which significantly contribute to the total plant occupational radiation dose; (2) compare exposures from specific

components and jobs at similar plants; and (3) provide occupational radiation exposure feedback to the engineering groups preparing design modifications or designing future plants. In this way, the REP provides essential information for maintaining occupational radiation doses ALARA at both operating and future nuclear generating stations.

33. Q. What is the benefit/cost evaluation program?

A. The benefit/cost evaluation program is a computer program that produces information which allows nuclear station personnel to evaluate the potential benefits of dose reduction actions in general. This evaluation allows personnel to determine whether the expected benefits of a specific action are greater than the anticipated costs of that action and whether a proposed action designed to reduce external whole body radiation exposure to workers is "reasonably achievable."

34. Q. What is this computer program based on?

A. The basis for the calculational methods used by the benefit/cost evaluation program is contained in the Atomic Industrial Forum ("AIF") report,

Potential Benefits of Reducing Occupational Radiation Exposure, AIF/NESP-010R. The methods were based on a detailed examination of the sequence of steps required to accomplish work in a radiation area and the effects of changing conditions that affect whole body radiation exposure. Because the same variables affect both the dose received on a job and the cost of performing that job, actions taken to reduce worker radiation exposure also can yield operational cost savings. The magnitude of the operation cost savings is different for each job and depends on whether the job is on the critical path, the type of workers employed, and the dose reduction techniques used. The benefit/cost evaluation computer program utilizes the complicated arithmetic of the AIF methodology and simplifies the evaluation of dose reduction actions.

35. Q. Are the individual workers at Edison's nuclear stations aware of its ALARA program?
- A. Yes. The training departments at each nuclear generating station address the ALARA concept. Employees are instructed on the fundamentals of radiation exposure, the importance of maintaining doses ALARA, and their role in accomplishing that

objective. A basic indoctrination course defining acceptable personnel conduct, protective equipment and clothing requirements, and the biological affects of radiation exposure is a requirement for all new workers. Retraining sessions are required on an annual basis.

36. Q. Do all workers receive the same amounts of training?

A. No. Special proficiency training is offered to workers who will be performing complex tasks in selected high radiation areas. In certain cases mock-ups of a component are used to develop and improve worker performance in the training sessions. This allows the worker to perform the actual job in less time and with less radiation dose.

37. Q. What are the objectives of Edison's training program?

A. Edison's training program is designed to ensure that each person is sufficiently trained in their job so as to adequately implement their responsibilities as specified in the individual's job position description and to fulfill any regulatory training requirements specified for that position.

38. Q. Who decides how much training an individual will receive?
- A. In general, Edison's training program is outlined in the Nuclear General Employee Training ("N-GET") program which is attached as Exhibit 3 to my testimony. The N-GET program provides a detailed outline of the training procedures at Edison. When a new worker starts at a nuclear station, however, the training supervisor is responsible for evaluating the person's experience and training and determining what additional training is necessary.
39. Q. Are you familiar with the N-GET program?
- A. Yes. As part of my job responsibilities, I am required to be familiar with Edison's N-GET program. In my opinion, this N-GET program provides sufficient training procedures to enable employees to learn how to help keep radiation exposures as low as is reasonably achievable.
40. Q. Do all workers who may be exposed to radiation at Edison receive the training outline in the N-GET program?
- A. Yes. All workers, whether they are Edison employees or contract workers hired to do a particular job, receive the same N-GET training.

41. Q. Would this training enable a contract worker to become familiar with a particular station?
- A. No, but the N-GET program does teach the workers to look out for and obey warning signs that are posted on all entrances to radiation controlled areas as prescribed by law. In addition, each worker who is unfamiliar with the plant he is working in is escorted to his job site by someone who is familiar with the plant and is supervised by a trained worker.
42. Q. Are all workers trained in how to use safety equipment?
- A. Yes. All workers, whether they are an Edison employee or a contract worker, are trained in how to use any safety equipment that is required for their job.
43. Q. Why does Edison retain contract workers?
- A. Edison will employ contract workers for a variety of different reasons. First, many nuclear stations have permanent contractors which are hired for specific jobs, such as the maintenance of pipes. These contractors are hired because they are specialists in doing these tasks. Second, Edison might hire a contract worker temporarily to do a

particular job that requires a special skill. For instance, if Edison did not have enough certified welders to do a certain job, it would hire contract workers who were certified welders just to do that one job. Third, Edison may hire temporary contract workers to supplement the number of Edison employees doing a particular task so that each person's dose is always maintained well under the regulatory limits.

44. Q. Does Edison monitor the radiation doses to a contract worker?

A. Yes. The monitoring program is used for every worker who enters a radiation controlled area.

45. Q. How does Edison keep a contract worker below his yearly and quarterly radiation dose limits?

A. Each contract worker must complete a NRC Form-4, which includes his occupational dose history, before he begins to work. From this form, Edison can determine the dose the worker has received in the current year and quarter and can establish appropriate restrictions to prevent the worker from exceeding either of those radiation dose limits.

46. Q. How does Edison monitor and control internal radiation dose?

A. Edison has a respiratory protection program that complies with 10 CFR §20 and NuReg 0041. This program ensures that the internal radiation dose to an individual is kept well below the legal limits. Edison monitors such exposure by performing periodic whole body counts on each individual assigned to a nuclear station. Although these counts are performed on-site, Edison utilizes the services of an independent vendor to evaluate the data and to provide the official results of each whole body count. The number of times per year a person receives a whole body count depends on the type of work the individual performs. This program includes contract workers who will receive a whole body count when arriving at the station if their occupational dose history warrants it. Finally, contract workers will receive a termination whole body count when they leave the site.

In addition to the whole body counting program, fecal and urine sample analysis will be performed as warranted. These samples will be analyzed by an independent vendor.

47. Q. Does Edison have any procedures whereby women of childbearing age are restricted from entering radiation controlled areas?
- A. No. Edison does not unilaterally restrict all women of childbearing age from being assigned to radiation jobs, but instead, Edison focuses its attention on providing adequate means of protecting both the declared pregnant woman and the fetus.
48. Q. What steps does Edison take to protect the fetus?
- A. Edison's first method of protecting an unborn child is to educate women as to the potential risks of radiation exposure to a fetus. This is accomplished by requiring every woman, when they receive their training, to watch a film on the potential risk of radiation exposure. In addition, each woman is given a regulatory guide that describes potential health effects to the fetus from radiation exposure. After they have received this information, each woman is required to sign a statement that she will tell her supervisor when she knows or suspects she is pregnant.
49. Q. What are Edison's procedures after a woman has declared herself to be pregnant?

A. Edison's policy is to limit the radiation exposure to such a women to 500 millirem over her gestation period. As a consequence, the exposure to the fetus will be significantly less. Each incident is handled on a case-by-case basis, and whenever possible, Edison will assign pregnant women to jobs that will not incur significant radiation doses.

50. Q. In your opinion, do the procedures and policies previously mentioned and attached to your testimony sufficiently allow Edison to keep radiation exposures ALARA at the Byron plant?

A. Yes. All of the procedures I have outlined interact with each other to form a comprehensive program that will keep radiation doses as low as is reasonably achievable.

1 That would be Applicant's Exhibit 2, or shall we
2 separately number them?

3 Perhaps we should.

4 What is your preference?

5 MR. MILLER: I would prefer to have them
6 numbered consecutively, and I am not certain what number
7 we are up to.

8 JUDGE SMITH: We are at 2.

9 MR. MILLER: So these would be Commonwealth
10 Edison Exhibits 2, 3 and 4 in evidence.

11 JUDGE SMITH: I think we need better
12 identification as to each of them now.

13 Radiation Protection Standards, dated February 28,
14 1982, that would be Commonwealth -- we started out by
15 using Applicant.

16 MR. MILLER: Fine.

17 JUDGE SMITH: Applicant Exhibit 2; would that be
18 correct?

19 MR. MILLER: Yes, sir.

20 JUDGE SMITH: The next one is Instructor's
21 Guide.

22 MR. MILLER: No, sir. I believe the next one
23 would be Policy and Procedures For Maintaining
24 Occupational Radiation Lxposures As Low As Is Reasonably
25 Achievable, dated November 1, 1981. It would be

1 Applicant's Exhibit 3.

2 JUDGE SMITH: Yes. Then?

3 MR. MILLER: Then Instructor's Guide for Nuclear
4 General Employee Training, which has a date in handwriting
5 on the front cover of January 21, 1983, would be
6 Applicant's Exhibit 4.

7 JUDGE SMITH: All right. The Exhibits are
8 received into evidence, and I have already -- we already
9 received the testimony.

10 (Applicant's Exhibits Nos. 2, 3 and 4 were
11 received in evidence.)

12 JUDGE SMITH: You will provide the reporter with
13 the three copies?

14 MR. MILLER: Yes, sir, we will.

15 Mr. Rescek is available for cross examination at
16 this time.

17 MR. THOMAS: Judge, at this time, then, I would
18 ask leave to file with the Board the cross examination
19 plan for Mr. Rescek.

20 I would also like to take this opportunity to
21 introduce to the Board Dr. Carl Morgan, who is sitting at
22 our table and will be assisting in the cross examination
23 of Mr. Rescek.

24 JUDGE SMITH: Good morning, Dr. Morgan.

25 MR. MORGAN: Good morning.

1 MR. THOMAS: May I proceed, your Honor?

2 JUDGE SMITH: Yes.

3 MR. THOMAS: Thank you.

4 CROSS-EXAMINATION ON BEHALF OF INTERVENOR

5 ROCKFORD LEAGUE OF WOMEN VOTERS

6 BY MR. THOMAS:

7 Q Mr. Rescek, regarding your qualifications to be the -- are
8 you the lead health physicist for Commonwealth Edison
9 Company at the present time?

10 A It's not that specific title.

11 I am the lead health physics technical service
12 engineer for Commonwealth Edison, which is a corporate
13 position. There is a lead health physicist at each of the
14 nuclear stations.

15 Q In terms of the corporate structure of Commonwealth
16 Edison, are you the top person in health physics?

17 A No, I am not. There is a -- I report to the corporate
18 health physicist.

19 Q Who is that?

20 A Robert Pavlick.

21 Q At any rate, regarding your own qualifications for the
22 position you have just outlined, you do not have a Ph.D.
23 in physics, do you?

24 A No, I do not.

25 Q Have you done any graduate work towards a Ph.D. in

1 physics?

2 A Not towards a Ph.D. I did do graduate work for a Master's
3 Degree.

4 Q In physics?

5 A In health physics, radiological health.

6 Q Have you done any graduate work in physics itself?

7 MR. MILLER: I object to that. The question is
8 vague.

9 Are you asking him generally about courses in
10 physics?

11 He responded with respect to health physics.

12 MR. THOMAS: The question does regard the
13 subject of physics.

14 A I --

15 MR. MILLER: Wait.

16 JUDGE SMITH: Why don't you just tell us what
17 kind of courses you have had in physics generally.

18 A (Continuing.) I have had graduate courses in nuclear
19 physics and radiation physics.

20 JUDGE CALLIHAN: Where did you do that work, Mr.
21 Rescek?

22 THE WITNESS: At the University of Michigan.

23 As part of the graduate program there, of
24 radiological health, you were required to take nuclear
25 physics courses.

1 BY MR. THOMAS:

2 Q Have you participated at all in a doctoral program in
3 physics?

4 A No.

5 Q Now, also with regard to your qualifications, you are not
6 a certified health physicist by the American Board of
7 Health Physics, are you?

8 A I don't have a broad certification.

9 I have a certification by the American Board of
10 Health Physics in the power reactor specialty.

11 Q But that is a narrower certification than a certification
12 as a health physicist; right?

13 A It is narrower, but it is in the power reactor area.

14 Q Okay. But, again, it is not as broad a certification as a
15 certification as a health physicist, is it?

16 MR. MILLER: I object. He has asked and
17 answered at least twice.

18 MR. THOMAS: Well, Judge, you know, he has
19 answered part of the question but I don't think that he
20 answered the full question.

21 MR. MILLER: I think he has already testified,
22 your Honor, that the certification that he possesses is
23 narrower than a certification as a health physicist.

24 JUDGE SMITH: I think he has.

25 MR. THOMAS: All right.

1 JUDGE SMITH: Is your --

2 MR. THOMAS: As long as the record is clear.

3 That's the only point that I want to make.

4 JUDGE SMITH: Yes.

5 MR. THOMAS: I --

6 JUDGE SMITH: If he hasn't, at least counsel has
7 stipulated that he has by his objection.

8 MR. THOMAS: Thank you, your Honor.

9 BY MR. THOMAS:

10 Q Mr. Rescek, what methods -- and this is in regard to
11 in-plant monitoring -- what methods are used or will be
12 used at Byron to monitor personnel regarding neutron
13 exposure?

14 A Byron station will use neutron dosimeters provided by an
15 outside vendor which will contain CR 39 as the principal
16 dosimeter for neutron exposure.

17 Q What is the name of that vendor?

18 A Landauer.

19 Q When was that contract let?

20 A Landauer has been under contract -- I think the most
21 recent bid specification that was let was back in '76, and
22 they have been under contract since then.

23 Q Is there a specific contract regarding Byron?

24 A No.

25 Q Now, with regard to the CR 39, those are badges; is that

1 right?

2 A Those are -- that is the neutron-sensitive material
3 incorporated in the badge.

4 Q Okay. Now, do you use CR 39 and polycarbonate foils?

5 A We just use CR 39.

6 Q But not the foils; is that correct?

7 A Right.

8 Q Now, how are these badges processed?

9 A I do not have the details onto the exact mechanisms in the
10 processing of the badges.

11 They are processed by Landauer, and it's an etching
12 and a track counting technique.

13 Q But you yourself do not know the details of that
14 processing; is that correct?

15 A Correct.

16 Q Now, if you know, does Landauer use both the static and
17 the electromagnetic etch pit, p-i-t, methods?

18 A I am not sure.

19 Q How will the in-plant monitoring system at Byron
20 distinguish and quantify the dose from these three
21 separate categories, ferrous neutrons, thermal neutrons
22 and epithermal neutrons?

23 MR. MILLER: Your Honor, I will object to that.

24 That may be six questions with respect to three
25 different kinds of neutrons and asking about the detection

1 and distinguishing between them.

2 I think that he ought to break up the question.

3 MR. THOMAS: May I withdraw that question, your
4 Honor, because there was a -- the question was -- there
5 was a word that I didn't intend to use.

6 BY MR. THOMAS:

7 Q All right. Mr. Rescek, how will the in-plant monitoring
8 system at Byron distinguish and quantify the dose from
9 fast neutrons?

10 A The neutron badge containing CR 39 will only be responding
11 to the fast neutrons in the work environment. It will not
12 be responding to the gamma radiation.

13 Q How will you distinguish and quantify thermal neutrons?

14 A The thermal neutron components at nuclear power plants is
15 not a significant source of radiation exposure.

16 If you look at the spectrums at power plants,
17 typically they run from around 80 KEV to around a couple
18 of hundred KEV as the principal neutron components.

19 Thermal neutrons can be monitored by the rem meters
20 that RCT's carry with them, radiation chemistry
21 technicians, who are the specialists trained to do this
22 monitoring.

23 Also, we are looking at the possibility of doing
24 some tests with Landauer's neutrak ER badge we have been
25 experimenting with, and that contains Debot TLD components

1 which can be used to monitor lower neutron energies if
2 they are present.

3 MR. MILLER: Excuse me, Mr. Rescek. I think --

4 MR. THOMAS: Judge, in the interest of
5 preserving the record, I would move to strike any portion
6 of the witness' answer, prior to the point where he began
7 talking about the rem meters, as not being responsive to
8 the question.

9 MR. MILLER: I think, Judge Smith, that the
10 answer was responsive. Mr. Rescek is attempting to put in
11 context the answer to Mr. Thomas' question so that the
12 Board and parties will understand what he is talking
13 about.

14 JUDGE SMITH: Well, this particular question and
15 answer, he can go either way, but you are going to have to
16 establish the ground rules for the cross examination.

17 MR. THOMAS: Yes.

18 JUDGE SMITH: In the past, yesterday, we had a
19 very good example of the witnesses sincerely trying to
20 help what was an inexperienced cross examination.

21 I think you probably are going to have a more
22 experienced cross examination. Obviously, you are. So if
23 you want literal answers to literal questions, you are
24 entitled to it.

25 MR. THOMAS: Right. That's what I am trying to

1 do at this point.

2 The witness was not trying to put anything in
3 context. He was trying to put in his own little bit of
4 opinion that these are not a significant source of -- I
5 forget exactly what the words he used were, and that's the
6 portion that I am objecting to.

7 I think the question was specific as to how they
8 would distinguish and quantify them.

9 JUDGE SMITH: It could have been answered
10 specifically. The answer, however, was relevant and
11 appropriate in the context of how we have been proceeding.

12 So let's go onto the next one, unless you feel
13 damaged by that answer.

14 MR. THOMAS: No. I just don't want to have to
15 repeatedly do this throughout the course of the
16 examination.

17 JUDGE SMITH: You have established what you
18 wanted and what you are entitled to, and I am sure Mr.
19 Rescek will cooperate.

20 MR. THOMAS: Thank you, your Honor.

21 JUDGE SMITH: It will make life easier for him,
22 by the way.

23 BY MR. THOMAS:

24 Q Finally, Mr. Rescek, how will the in-plant monitoring
25 system at Byron distinguish and quantify the dose from

1 epithermal neutrons?

2 A The CR 39 component of the neutron dosimeter will respond
3 down to approximately the 100 to 150 KEV range.

4 Q In your opinion, that will be sufficient to distinguish
5 and quantify the dose from epithermal neutrons?

6 A In my opinion, it is.

7 Landauer has participated in various outside studies
8 with the University of Michigan to respond to the
9 moderated Californium-252 source that will become the
10 standard for neutron dosimetry and they have passed those
11 types of tests with the CR 39 badge.

12 Q What is the energy of thermal neutrons?

13 A .025 KEV -- .025 EV.

14 Q Would you tell me, please, what is the Bragg-Gray
15 Principle?

16 MR. MILLER: I am going to object. It seems to
17 me that is beyond the scope of Mr. Rescek's direct
18 testimony.

19 I don't understand how this has anything to do with
20 anything in his direct.

21 JUDGE SMITH: It perhaps is beyond the scope of
22 the direct testimony, but after consulting with the
23 technical members of the Board, it may very well be to
24 test his competence to make his direct testimony.

25 Is that the purpose of it?

1 MR. THOMAS: That is exactly it, your Honor.

2 MR. MILLER: Do you have the question, Mr.

3 Rescek?

4 THE WITNESS: No. Would you repeat it?

5 JUDGE SMITH: Not yet.

6 Overruled.

7 BY MR. THOMAS:

8 Q The question was: What is the Bragg-Gray Principle?

9 A The Bragg-Gray Principle deals with the design of your
10 instrumentation in order to properly measure the exposure
11 rate. It deals with the wall of the detector being of
12 sufficient size so that losses in the wall and ionizations
13 and losses from the chamber are balanced.

14 Q Can you give some mathematical relation to make your
15 answer more specific?

16 MR. MILLER: I am going to object. Some
17 mathematical relation?

18 Frankly, I don't understand where this is going.
19 This isn't, after all, a quiz on Mr. Rescek's knowledge of
20 some formula.

21 If there is a specific question with respect to the
22 formula on the Bragg-Gray Principle, then the question
23 should be formulated in that way.

24 I think the question is vague, and I object on that
25 ground.

1 MR. THOMAS: Judge, the fact that Mr. Miller
2 might not understand the question is not the grounds for
3 an objection. It's the witness who has the right to
4 understand the question.

5 JUDGE SMITH: I think you misstated Mr. Miller.
6 He understands the question. He doesn't understand
7 where the question is going.

8 MR. MILLER: I don't know what the record is
9 going to look like if you question some mathematical
10 relationship.

11 JUDGE SMITH: The purpose is still to test the
12 competency of the witness and the question is is the
13 question reasonable toward that end.

14 MR. MILLER: Yes, sir.

15 JUDGE SMITH: We are going to allow some
16 latitude on this line, on the questioning of this for this
17 purpose; and this falls within that latitude, so it's
18 overruled.

19 MR. MILLER: Do you have the question in mind,
20 Mr. Rescek?

21 THE WITNESS: Could you repeat it?

22 BY MR. THOMAS:

23 Q Can you give a mathematical equation or relation
24 specifying the Bragg-Gray Principle?

25 A No, not at this time.

1 Q What is the maximum permissible flux for thermal neutrons?

2 A Could you clarify that? Maximum permissible flux from 10
3 CFR 20 or from what source or what time period?

4 Q I am speaking of the values given by the National Council
5 on Radiation Protection.

6 A I do not have recollection of the exact values.

7 Q What is the maximum permissible flux for fast neutrons?

8 MR. MILLER: Once again, I am going to object.
9 This is going well beyond the scope of Mr. Rescek's direct
10 testimony and anything going to his qualification.

11 We are going to have Dr. Fabrikant as a witness, who
12 is familiar with NCRP and ICRP recommendations and will be
13 prepared to answer questions.

14 I don't think that there has been any showing that
15 somehow Mr. Rescek's qualifications to perform his job at
16 Commonwealth Edison Company and sponsor the testimony that
17 is before this Board is dependent on his intimate
18 familiarity with the NCRP recommendations on such things
19 as the maximum permissible flux of thermal neutrons.

20 JUDGE SMITH: Well, will you stipulate, then,
21 that he does not have familiarity with it?

22 MR. MILLER: He may very well, your Honor.

23 I think we are going to go through a half-hour of
24 examination on things that are basically irrelevant to his
25 qualifications.

1 JUDGE SMITH: We do have the cross examination
2 plan, which lists the areas in which the examination is
3 going, and we believe that it is reasonably short. There
4 are just a few more.

5 We said we were going to give wide latitude in this
6 area.

7 It may very well be what is actually needed for his
8 competence, but they are allowed to proceed up to that
9 point and make their argument.

10 MR. THOMAS: Thank you, Judge.

11 Do you remember the question?

12 THE WITNESS: Would you repeat it?

13 MR. THOMAS: Yes.

14 BY MR. THOMAS:

15 Q What is the maximum permissible flux for fast neutrons?

16 A I do not recollect the exact values given in the ICRP.

17 I am familiar with those documents and am familiar
18 with where I can obtain those values, should I need them
19 for a specific job duty.

20 Q Do you know the quality factor for fast and thermal
21 neutrons?

22 A Fast neutron quality factor is 10, and I believe that, not
23 knowing the exact quality factor that might apply to
24 thermal neutrons, it is conservative to apply a factor of
25 10 to the neutron spectrum, and that would be a

1 conservative estimate of the neutron quality factor for
2 thermal neutrons.

3 Q Now, in case of a high neutron exposure accident, a
4 criticality accident, what is the principal radionuclide
5 induced in blood?

6 A I am not sure.

7 Q Again, in the case of a high neutron exposure accident, a
8 criticality accident, what is the principal radionuclide
9 induced in air?

10 A Again, I am not sure.

11 Q Now, with regard to your testimony concerning the subject
12 of TLD's -- all caps TLD's -- do TLD's give any response
13 to neutrons?

14 A Yes.

15 Q And would you say high, medium, little? Can you give us a
16 gauge on that?

17 A It would depend on the TLD material that you were using.

18 Q What about fast neutrons: How much of a reading or
19 response do they give regarding fast neutrons?

20 A There may be some small response to fast neutrons, but
21 relative to the thermal neutrons' response, it would be
22 very small.

23 JUDGE SMITH: When you first use an anagram,
24 TLD, would you establish what it means, translucent
25 dosimeter.

1 BY MR. THOMAS:

2 Q Would you indicate what you mean by the letters TLD in
3 your testimony?

4 A Thermoluminescent dosimeter.

5 Q Will Commonwealth Edison -- well, strike that.

6 Is the Applicant still using NTA film?

7 A No.

8 Q Do you know what the principal defects of the NTA film
9 monitoring process are?

10 A NTA film is not very sensitive to neutrons. It doesn't
11 monitor very well the neutron energies that exist at power
12 plants, so its sensitivity to various -- it has a
13 threshold of around 700 to 800 KEV to neutrons, and it
14 also has a problem with fading after the tracks have been
15 created.

16 Q When did the Applicant cease using NTA film, if you know?

17 A I believe it was approximately 1980.

18 Q And there are no plans to use NTA film at Byron?

19 A There are no plans.

20 Q What special medical examinations, in your opinion, are
21 required in the event of employee neutron exposure?

22 JUDGE SMITH: Now, there is no objection to
23 this, but I assured Mr. Miller that we would allow
24 reasonable amount of inquiry into the competence of the
25 witness.

1 Based on my examination of the cross examination
2 plan, it wasn't very much.

3 MR. THOMAS: Yes.

4 JUDGE SMITH: This question isn't on the cross
5 examination plan.

6 MR. THOMAS: I didn't put every -- I tried to --
7 my understanding of the plan was that it should set forth
8 categories in which I planned to inquire.

9 JUDGE SMITH: Yes.

10 MR. THOMAS: I didn't put every question on the
11 plan.

12 JUDGE SMITH: I understand that.

13 I just can't identify that as being in a category.

14 I just wondered if I made a misrepresentation to Mr.
15 Miller.

16 MR. THOMAS: No, no. This has to do with the
17 question of neutron exposure monitoring.

18 JUDGE SMITH: Okay.

19 THE WITNESS: Would you repeat the question?

20 MR. THOMAS: Yes.

21 BY MR. THOMAS:

22 Q What special medical examinations are required in the
23 event of employee neutron exposure, in your opinion?

24 A There are no special medical examinations required for
25 receiving neutron exposures within the legal limits.

1 MR. THOMAS: Excuse me a moment, please.

2 BY MR. THOMAS:

3 Q In your opinion, should an employee who has received
4 neutron exposure be sent to an ophthalmologist for a
5 determination of whether cataracts or pre-cancerous
6 condition has developed as a result of that exposure?

7 MR. MILLER: I am going to object unless there
8 is some quantification in the question as to the amount of
9 exposure the employee is assumed to have received. I
10 don't know how the witness can answer that question as
11 posed.

12 JUDGE SMITH: Don't you agree?

13 MR. THOMAS: Pardon?

14 JUDGE SMITH: Do you agree with the objection?

15 MR. THOMAS: Only if the witness indicates, you
16 know, what Mr. Miller has indicated. Again, if the
17 witness has a problem with the question, I think the
18 witness can indicate the problem with the question rather
19 than Mr. Miller.

20 MR. MILLER: Let's get something straight right
21 now.

22 I think that a lawyer has an obligation to the Board
23 and the parties, as well as to the witness, to make
24 certain that there is a record that is created that is
25 intelligible when we go back and look at a transcript

1 months after this hearing.

2 So I will make objections as appropriate when
3 questions are asked.

4 JUDGE SMITH: Sustained.

5 BY MR. THOMAS:

6 Q If the exposure to fast neutrons is ten rems, in your
7 opinion, should he be examined by an ophthalmologist?

8 A Exposures exceeding the regulatory requirements are
9 referred to our medical department and we also maintain
10 consultation with Radiation Management Corporation as
11 advisors in the area of medical applications dealing with
12 overexposures and we would refer that case to our medical
13 department and to our consultants to make that
14 determination.

15 Q Are you saying you do not feel qualified to make the
16 determination?

17 A Again, it's Commonwealth Edison Company's procedure that
18 the medical department make that determination. I am not
19 in a position within the company to make such a
20 determination.

21 Q Now, with regard to area monitoring of neutrons, what
22 instruments will be used at Byron regarding area
23 monitoring of fast neutrons?

24 A I would think that question would be better asked of the
25 Byron representative. As far as in-plant area monitors,

1 there will be no area monitor specifically for personnel
2 requirements. Monitoring is done using portable
3 instruments.

4 Q Just so I understand your question --

5 A To the best of my knowledge there are no in-plant area
6 monitors for personnel protection reasons.

7 Q Thank you. That would be true then for thermal neutrons,
8 too?

9 A Correct.

10 Q Okay. And would that also then be true for epithermal
11 neutrons?

12 A Correct.

13 Q What instruments will be used to measure the neutron dose
14 when a high gamma radiation field is also present?

15 A The --

16 JUDGE SMITH: Now, you have gone into the actual
17 testimony at this point; does that follow?

18 MR. THOMAS: Pardon?

19 JUDGE SMITH: You are actually going into the
20 actual practices at Byron and the actual testimony as
21 compared to his competence?

22 MR. THOMAS: Yes.

23 JUDGE SMITH: Are you done with the line of
24 questioning on his competence?

25 MR. THOMAS: I believe so. There are -- when we

1 get to the area of calibration of instruments, there is a
2 little bit of that in there, but we are largely done with
3 that.

4 JUDGE SMITH: Okay.

5 MR. THOMAS: I am sorry. Do you wish to have me
6 repeat the question?

7 THE WITNESS: Would you repeat the question?

8 MR. THOMAS: Certainly.

9 BY MR. THOMAS:

10 Q What instruments will be used at Byron to measure the
11 neutron dose when a high gamma radiation field is also
12 present; in other words, a mixed field?

13 A The neutron dosimeter the individual wears will monitor
14 his neutron exposure. The instrumentation that is taken
15 on the job will be a rem meter.

16 Q And does the rem meter distinguish neutron from gamma
17 radiation?

18 A Yes, it does.

19 Q Does it distinguish between fast and thermal neutrons?

20 A It doesn't provide an independent readout for each neutron
21 energy region.

22 It will monitor neutron energies of all neutron
23 energies and provide one readout.

24 Q So it will not distinguish between fast and thermal; is
25 that correct?

- 1 A It does not distinguish the independent or the individual
2 dose rates from each but it does monitor and sums the
3 exposure rates from each energy region and provides a
4 total exposure rate to the individual.
- 5 Q Now, in addition to the rem meter in that answer, you also --
6 were you referring to the CR 39's?
- 7 A Correct.
- 8 Q Do the CR 39's distinguish neutron from gamma radiation?
- 9 A Yes.
- 10 Q And do the CR 39's distinguish between fast and thermal
11 neutrons?
- 12 A CR 39 will only monitor the intermediate and fast neutron
13 regions.
- 14 Q So your answer to my question is no?
- 15 A No.
- 16 Q Is that correct? Is that correct, the answer -- they do
17 not -- the CR 39's do not distinguish between fast and
18 thermal neutrons?
- 19 A It distinguishes in a sense that it is not sensitive to
20 the thermal neutrons, so in that sense it does distinguish
21 between the two, because you are getting the fast and
22 intermediate neutron component.
- 23 Q But you won't get any reading for the thermals; is that
24 right?
- 25 A Correct.

BOARD EXAMINATION

BY JUDGE COLE:

1 Q So it doesn't measure the thermals?

2 A It doesn't measure the thermals.

3 MR. THOMAS: Thank you.

4 BY MR. THOMAS:

5 Q Do you know how many instruments of each type will be used
6 at Byron?

7 A No, I do not. Again, that question should be directed to
8 the Byron testimony of Jim Van Laere.

9 Q How often will the Byron monitoring instruments be
10 calibrated?

11 A To the best of my knowledge, every quarter.

12 Q And how will they be calibrated?

13 A They will be calibrated using sources traceable to NBS.

14 MR. MILLER: For the record, Mr. Rescek, when
15 you use the initials, would you tell us what those
16 initials stand for?

17 A National Bureau of Standards.

18 MR. MILLER: Thank you.

19 BY MR. THOMAS:

20 Q How is the or how will the calibration fix on portable
21 instruments be maintained?

22 A I am not sure exactly what you mean by how they will be.

23 Are you looking for detailed procedures or --
24
25

- 1 Q I am looking for the procedure, right.
- 2 A Jim Van Laere's testimony will be able to cover that.
- 3 Q So then you don't know?
- 4 A I won't know exactly the details of their procedures. I
5 have an understanding in general how they are maintained.
- 6 Q Would you give us that understanding, please?
- 7 A The instruments are calibrated on a quarterly basis,
8 following station procedures and using appropriate sources
9 traceable to the NBS, National Bureau of Standards.
10 Maintenance of instruments will be done as needed based on
11 determination by individuals who are either using the
12 portable instruments, if it is not functioning, such as
13 instruments are daily check sourced from the control room.
14 Those are the in-plant portable instrumentation. The
15 portable instrumentation is daily check sourced by the
16 individual user. Based on the check sources and the
17 individual response will be determined whether or not
18 maintenance is needed.
- 19 Q Do you have any standard neutron sources for checking the
20 neutron instruments?
- 21 A I believe Byron is purchasing a Californium 252 source.
- 22 Q In the future?
- 23 A It will be -- I am not sure of the arrival date. It may
24 be here. It may be coming this year.
- 25 Q There are none now but there are plans to get some in the

1 future?

2 A Yes, if they are not here.

3 Q What standard source do you use to check the beta dose?

4 A Strontium-90.

5 Q Is it from the Bureau of Standards?

6 A Strontium-90 source, if it's used, if a source is just
7 used to check instrument response, it is not required to
8 be traceable. You are just collecting the response of the
9 instrument.

10 Q So then it's not from the Bureau of Standards?

11 A Check sources are not necessarily traceable to National
12 Bureau of Standards, right.

13 Q So then you know the response to betas but you don't know
14 how much beta dose; is that correct?

15 A I am only referring to the check source response to betas,
16 not to the calibration of the instrument.

17 You have daily check sources, daily checks that are
18 used using check sources and then you have orderly
19 calibrations using sources.

20 Q So then they are not calibrated for betas; is that right?

21 A They are calibrated for betas on a quarterly basis.

22 Q With regard now to employee training and record keeping,
23 does Applicant keep a record of the history of each
24 incident resulting in significant radiation exposure?

25 MR. MILLER: Could we have a definition of the

1 word "significant," in the question? I object on the
2 grounds that it is vague as asked.

3 JUDGE SMITH: If you prefer to supply the
4 definition, you may. If not, we will let the witness tell
5 what the practice is in his view of it.

6 MR. THOMAS: That would be my preference, your
7 Honor, the latter.

8 A I would like you to clarify what you mean by
9 "significant," also.

10 BY MR. THOMAS:

11 Q Let me ask you. When does Applicant keep the record of a
12 history of a radiation exposure incident, under what
13 criteria?

14 A Are you referring to incident as something as a
15 non-routine exposure or how are you referring to incident?

16 Q Yes, non-routine exposure.

17 A We keep records of all radiation exposures for
18 individuals, routine and non-routine.

19 If exposure is non-routine, that information is
20 documented under what we call a radiation occurrence
21 report form and that record is kept.

22 Q Is that a permanent record indicating exactly what
23 happened during that incident?

24 A A permanent record is generated for the individual, which
25 explains how the exposure was received and how much

1 exposure, yes.

2 Q And that remains in that employee's file?

3 A If it's an incident that is of high enough exposure that a
4 separate record is required, yes, it can be put into --
5 yes, it would be put into the employee's file and would be
6 documented under a comment section for NRC Form 5 record.

7 Q Now, when you say "high enough exposure," what do you mean
8 by that term?

9 A Well, all -- any exposures that would exceed legal limits
10 certainly would have an incident report written up and
11 would have documentation in an individual's record.

12 Q Does that record indicate what caused the incident?

13 A Yes, it does. Any exposure that would exceed legal limits
14 would be required for us to determine the cause and to
15 apply appropriate corrective action in the documentation
16 with the Nuclear Regulatory Commission.

17 Q I am sorry. It does contain steps that will be taken to
18 prevent that in the future; is that right?

19 A Yes, it does, and the cause of the incident.

20 Q What if it's half the legal limits; what are the record
21 keeping procedures then?

22 A If it's an exposure that exceeded the allowable exposure
23 for that job, it may be -- it would be documented under
24 Radiation Occurrence Report and that occurrence report
25 would also address the cause of the incident and the

1 corrective actions.

2 Q What information does Applicant give in the employee
3 training p... regarding somatic effects of radiation
4 exposure, if any?

5 A I would like to just refer you to the exhibit that
6 outlines the N-GET training material.

7 Q Okay. Where on that material is that subject covered?

8 A Starting on Page 10 of 69 through Page 23 deal with the
9 biological effects of radiation.

10 MR. CALLIHAN: To which exhibit are you
11 referring, Mr. Rescek?

12 THE WITNESS: Exhibit 3.

13 JUDGE CALLIHAN: Thank you.

14 MR. MILLER: Rescek's Exhibit 3, which is
15 Applicant's Exhibit 4.

16 Mr. Rescek, I am having some difficulty locating it
17 myself. Perhaps you could tell us if it's towards the
18 front of this document.

19 THE WITNESS: On Page 10, starting on Page 10 of
20 the exhibit. "Radiation may result in damage to the
21 body." It's where the biological effects --

22 JUDGE CALLIHAN: For the record, would you say
23 that's Applicant's Exhibit No. --

24 MR. MILLER: 4.

25 THE WITNESS: -- Applicant's Exhibit No. 4.

1 JUDGE CALLIHAN: Thank you.

2 BY MR. THOMAS:

3 Q Does this manual address the genetic effects of radiation
4 exposure?

5 I am sorry.

6 A Can you repeat that?

7 Q Yes. Does this manual also address the genetic effects of
8 radiation exposure?

9 A Yes, it does.

10 Q Does it also address the teratogenic effects of radiation
11 exposure?

12 A Yes.

13 JUDGE SMITH: The method of pagination is not
14 clear to several of us -- two of us, at least.

15 JUDGE COLE: Three.

16 JUDGE SMITH: I have, I think, stumbled upon a
17 Page 10, but then there seems to be others, too.

18 Yes, I found it.

19 MR. MILLER: I think, Judge Smith, that it's the
20 portion of Applicant's Exhibit 4 that begins, "Module 3,
21 radiation protection," Page 1 of 69. It's about a quarter
22 of the way through the stack. Page 10 of that module, I
23 believe, is the document to which Mr. Rescek is referring.

24 Is that correct?

25 JUDGE SMITH: Page 10 of 71.

1 MR. MILLER: Yes, mine is Page 10 of 71.

2 Do we have different exhibits?

3 Do you mind if I get this straightened out?

4 MR. THOMAS: No.

5 MR. MILLER: Mr. Rescek has just confirmed that
6 it is, in fact, the portion that is 71 pages long that is
7 Module Exhibit 3 in Applicant's Exhibit 4.

8 MR. THOMAS: Were the page numbers correct that
9 he gave, is it 69 dash --

10 A It starts on Page 10 of 71. It is 71 pages long and it
11 starts on Page 10.

12 BY MR. THOMAS:

13 Q Returning for the moment to Edison record keeping
14 concerning the history of incidents resulting in radiation
15 exposure, are those record-keeping requirements the same
16 for temporary employees, also?

17 A Excuse me. I didn't quite catch all of that. I had --

18 Q All right. Regarding the record-keeping requirements that
19 we discussed before for Edison employees or Applicant's
20 employees in incidents resulting in significant radiation
21 exposure, you know, the series in question --

22 A Yes.

23 Q -- are those requirements the same for temporary workers?

24 A Yes, they are.

25 Q Now, in your testimony I believe you indicate that the

1 same training is given contractual workers as is given to
2 Commonwealth Edison employees; is that right?

3 A The N-GET course is the same, yes.

4 Q But the contractual employees or workers do not receive
5 the same training as Edison employees, do they, because
6 Edison employees, for example, get annual training
7 sessions, don't they?

8 A If contractors are onsite for a year, they, too, will
9 receive annual retraining.

10 Q Okay. But if they aren't, they don't?

11 A Then if they come back to us, they go through the full
12 training over again.

13 Q But, again, unless they are with you for a year, they
14 don't receive the annual retraining that you refer to on
15 Page 21 of your testimony; right?

16 A Should they leave and come back, if they don't receive the
17 annual retraining, they would receive the full course,
18 which covers everything in the annual retraining, so in
19 essence they are receiving equal or maybe greater
20 training.

21 JUDGE SMITH: Implicit in your answer is that
22 the annual retraining is a refresher which is subsumed by
23 the initial training?

24 THE WITNESS: Right.

25 BY MR. THOMAS:

1 Q What is the total number of hours in the training program?

2 A It's a one-day training program.

3 Q That's the extent of it, one day?

4 A That's correct.

5 Q Do you mean that that whole N-GET manual is covered in one
6 day?

7 MR. MILLER: Objection. The question has been
8 asked and answered twice.

9 MR. THOMAS: Well, I just want to -- I think
10 that -- I just want to make sure that I understand exactly
11 what he is saying.

12 JUDGE SMITH: The objection is sustained, that's
13 correct. You are arguing with him now.

14 MR. THOMAS: Well, all right, all right.

15 JUDGE SMITH: And you are commenting improperly
16 upon his testimony.

17 BY MR. THOMAS:

18 Q How long are the annual retraining sessions?

19 A I believe they are about four to six hours.

20 Q Are there any exemptions?

21 A Exemptions, no.

22 Q Now, in your testimony you refer to a policy that a
23 so-called declared pregnant woman gets no more than 500
24 millirems during the gestation period; is that right?

25 A That's correct.

1 Q How do you assure, again, a so-called declared pregnant
2 woman gets no more than 500 millirems?

3 A Once a woman has declared her pregnancy, she will not be
4 assigned work in radiation areas that would allow her to
5 accumulate significant exposure towards that 500. So we
6 monitor her work activities to ensure that she doesn't
7 exceed the 500 millirem in a quarter -- in the nine-month
8 period, excuse me.

9 Q What kind of monitoring?

10 A The work that is done in radiation areas requires the --
11 it's incumbent upon the work group supervisor, the
12 individual and the health physics staff to ensure that she
13 is not assigned to that type of work.

14 Q Is this direct observation or simply a matter of
15 assignment?

16 A Assignment and observation.

17 Q Is there any --

18 JUDGE SMITH: Excuse me. Before you leave the
19 pregnancy issue, I would like to ask a question about it.

20 MR. THOMAS: Sure. I am not leaving it but go
21 ahead.

22 JUDGE SMITH: Well, continue then.

23 BY MR. THOMAS:

24 Q Is there any protection for women of childbearing age who
25 are not declared pregnant, in other words, before any

1 declaration of pregnancy?

2 A A woman who is not pregnant comes under the same rules
3 that apply to all plant workers.

4 Q So then there is no special protection?

5 A No special treatment.

6 Q What about the period before a woman realizes that she is
7 pregnant?

8 MR. MILLER: I object to the form of the
9 question. I don't know how the witness can answer a
10 question like that in terms of protection, in terms of
11 treatment?

12 JUDGE SMITH: How is the 500 millirem taken into
13 account before the pregnancy is declared or is it?

14 MR. THOMAS: That is a better question.

15 MR. MILLER: Yes, that is.

16 A There is no special treatment that would be set aside in
17 terms of a woman is not -- her dose is not monitored
18 directly in the sense to assure that in any given three-
19 or four-week period she couldn't have received several
20 hundred millirem. Otherwise, then there would have to be
21 special treatments or special guidelines set up for the
22 woman that would not allow her to work on a job on a given
23 day that might receive, say, several hundred millirem and
24 that would then put her work assignments in a different
25 category from everyone else, so in that sense it is not

1 taken into account.

2 BOARD EXAMINATION

3 BY JUDGE SMITH:

4 Q But after she is aware that she is pregnant and declares
5 it, is there any effort to go back in time to see what the
6 possible exposure might have been to her?

7 A Yes, that would be routine, since all the exposures in the
8 plants are monitored for everyone. As soon as she
9 declares her pregnancy, we would review the radiation
10 exposure records for her, make a determination as to how
11 much exposure she has received and then based on that
12 exposure record determine any applicable exposure she
13 might be able to receive and still keep her below the 500
14 limit.

15 Q Okay. Then along that line, this is where I will put my
16 question in.

17 Are there any disincentives, employment
18 disincentives that the woman would experience by declaring
19 her pregnancy early or suspected pregnancy?

20 A To the best of my knowledge, there are no disincentives.
21 She is re-assigned other work.

22 Q Is there an affirmative policy to avoid disincentives?

23 A I am not sure I know how you are trying to apply that.

24 Q Well, as you mentioned, if she declares her pregnancy
25 early, perhaps she might be knocked out of a promotion,

1 for example?

2 A No, there would be no disadvantages to her because she is
3 pregnant.

4 Q Or declares early?

5 A Or declares early.

6 BY MR. THOMAS:

7 Q Are there limits for a declared pregnant woman with regard
8 to internal dose exposure?

9 A You are referring strictly to the declared pregnant woman
10 or to --

11 Q Or to what?

12 A I am asking you. Are you referring strictly to a declared
13 pregnant woman regarding the internal burden?

14 Q For the time being, yes.

15 A Yes, women who have declared their pregnancy would not be
16 allowed to receive significant internal exposure.

17 Q What does that mean, significant internal exposure?

18 A Exposure would be kept well below legal limits and in all
19 probability she would not be working in areas where there
20 is airborne -- she would not be working in airborne
21 radioactivity areas.

22 Q Are there any criterias as to how far below legal
23 requirements it would be kept? You say well below. Are
24 there any stated criteria?

25 A Again, the limits apply to the fetus, and the work

1 assignments that she is given would not include work
2 assignments in airborne radioactivity areas to the best of
3 my knowledge.

4 Q So then I take it from your answer that there are no
5 numerical limits?

6 A To the best of my knowledge, we haven't defined specific
7 numerical internal limits.

8 Q Okay. In the more general case, are there internal dose
9 exposure limits for women of childbearing age, in other
10 words, not declared pregnant women?

11 A They would fall under the same category as all plant
12 workers regarding their internal exposure.

13 This is not a practical problem in the sense that
14 numerical values had to be given because it is not typical
15 for a person to receive more than a few percent of an
16 internal burden.

17 Q Okay. Do you know how this would restrict a woman's
18 internal dose regarding strontium-90?

19 MR. MILLER: I am sorry. I --

20 A Strontium-90 is not in significant quantities to -- the
21 levels of strontium-90 that exist in airborne or in air
22 samples show it to be the below the levels at which it is
23 even considered to be present under the 10 CFR Part 20
24 guidelines.

25 BY MR. THOMAS:

1 Q Strontium-90 has a very long half-life in the bone,
2 doesn't it?

3 A That's correct; but that is taken into account in the
4 determination of what the maximum permissible
5 concentration for strontium-90 would be in the air and the
6 levels present in our nuclear power plants are
7 significantly or like thousands -- on the order of a
8 thousand to 10,000 times below those NCP values, that they
9 need not be considered present under the requirements of
10 10 CFR 20.

11 Q In your opinion, what fraction of the maximum permissible
12 dose should a woman's internal dose of strontium-90 be
13 restricted to?

14 MR. MILLER: Excuse me. Are we talking about
15 internal?

16 A Again, there is no --

17 MR. MILLER: Excuse me. I am going to object,
18 Mr. Rescek.

19 MR. THOMAS: That was in the question, internal.

20 MR. MILLER: Perhaps I missed it then, excuse
21 me.

22 With that understanding, go ahead if you understand
23 the question.

24 A Again, the strontium-90 does not exist in concentrations
25 where it is -- it would result in any uptake that would be

1 measurable.

2 BY MR. THOMAS:

3 Q Would your answer be the same with regard to cesium-137?

4 A Could you rephrase the question? Was that cesium-139?

5 Q All right. In your opinion, what fraction of the maximum
6 permissible dose of cesium-137 should a woman's internal
7 dose be restricted to?

8 A Is this -- this is a non-declared pregnancy?

9 Q Yes.

10 A Her limits are kept below -- similar to all plant workers,
11 where they are kept below the -- we have an investigative
12 level of 3 percent for any single nuclei and 5 percent
13 body burden for total nuclei and all workers exposures are --
14 an effort is made to keep all internal burdens below,
15 below those values.

16 Q What would you do if such a woman had a body burden of 50
17 percent of the permissible body burden for either
18 strontium-90 or cesium-137?

19 MR. MILLER: I am going to object. First of
20 all, that seems to me to be two questions with respect to
21 two different radionuclides, and with respect to
22 strontium-90 the question lacks foundation. Mr. Rescek
23 has testified as to Commonwealth's level of experience in
24 power plants as they are undeductible by regulatory
25 limits. To ask him a question about 50-percent body

1 burden seems improper.

2 JUDGE SMITH: Okay. In view of the fact that
3 this is a hypothetical question and understood to be based
4 upon his earlier testimony, we will allow the answer.

5 THE WITNESS: Could you repeat the question?

6 MR. THOMAS: May we have the reporter read it --
7 well, I will break it down into its component parts.

8 BY MR. THOMAS:

9 Q What would you do if a woman had 50 percent of the body
10 burden with respect to strontium-90?

11 A At that level of internal burden, she would be removed
12 from areas where she could receive any additional uptake.
13 Again, that exceeds our values of 3 percent for any
14 nuclide and 5 percent total, which is our trigger values
15 to determine the individual has received internal
16 exposure; and at a value of 50 percent and being a
17 strontium-90 type, being close to the bones, she would not
18 be allowed back into that type of work environment that
19 could re-expose her and she would be referred to the
20 medical department to evaluate any type of further actions
21 that would need to be taken.

22 Q What action, if any, would you take if the strontium-90
23 level is 3 percent of the NRC maximum permissible body
24 burden?

25 A A hypothetical again, there would be no special action

1 taken.

2 Q With regard to the cesium-137, what is the -- what action,
3 if any, would be taken if the level were 3 percent of the
4 NRC of the maximum permissible body burden?

5 A 3 percent, cesium-137?

6 Q Yes.

7 A No action would be taken.

8 BOARD EXAMINATION

9 BY JUDGE COLE:

10 Q Where did the 3 percent come up, sir?

11 A Those are our own trigger values. The ANSI guidelines
12 recommend that if you are above 10 percent of an internal
13 burden -- and they have I think 10 percent and 25 percent
14 trigger levels; and we have found, based on our own
15 experience of having very little internal exposure, that
16 we have brought down our trigger levels as low as possible
17 to still allow us some kind of ALARA criteria to say
18 someone has received some internal exposure that we
19 probably could have controlled.

20 So we have kept our trigger device as low as
21 possible to alert us as soon as possible on any internal
22 exposure.

23 Q What does it trigger?

24 A An investigation by the HP staff to evaluate the internal
25 burden and why it was received.

1 JUDGE COLE: Okay. Thank you.

2 BY MR. THOMAS:

3 Q If a woman received 3 percent maximum permissible body
4 burden of the strontium-90, she would automatically
5 receive in excess of 500 millirems during the gestation
6 period, wouldn't she?

7 A I answered your question from a hypothetical case.

8 Q Well, I mean, but I am asking you that. I am putting that
9 question.

10 A Are you saying that if she had 3 percent of the body
11 burden, that she would receive 500 millirem to the fetus;
12 is that --

13 Q During the gestation period.

14 A -- during the gestation period?

15 MR. MILLER: Can we understand that this is a
16 totally hypothetical exercise that Mr. Rescek is going
17 forward on? I think he has testified that this has never
18 occurred.

19 JUDGE SMITH: He has already mentioned in
20 context of this answer coming up, that it's hypothetical.

21 A I am not sure of the exact exposure that would result to
22 the fetus from a 3 percent hypothetical strontium-90 body
23 burden.

24 BY MR. THOMAS:

25 Q Now, referring for the moment to Page 36 of Exhibit 4, I

1 believe, if our numbering --

2 JUDGE SMITH: Before you leave this subject --

3 MR. THOMAS: Sure.

4 JUDGE SMITH: -- I see there is something I
5 can't find in your testimony where you were speaking of
6 the 500 millirem to the woman and suddenly it seems to me
7 you started talking about 500 millirem to the fetus.

8 Am I correct in my perceived distinction there? I
9 can't find your actual testimony. By looking at your
10 outline I see that you --

11 MR. MILLER: It's the last page of Mr. Rescek's
12 prepared testimony, Page 27.

13 JUDGE SMITH: All right. Yes, you did say in
14 both instances, the outline and the testimony that it's
15 exposure to a woman, and your last answer -- last two
16 answers, in fact -- your answer was given with respect to
17 exposure to the fetus.

18 THE WITNESS: That was his question directed the
19 exposure to the fetus by saying hypothetically if the
20 strontium-90 uptake was of a certain value it would result
21 in such and such exposure to the fetus, so I was only
22 responding to his question of exposure to the fetus.

23 JUDGE SMITH: I see.

24 BY MR. THOMAS:

25 Q Well, if that was your understanding of the question, I

1 would ask the question in terms of the exposure to the
2 woman, also.

3 A Again, the exposure to the woman, if it was the 3 percent
4 body burden, would be 3 percent of the permissible
5 exposure that she could receive from strontium-90.

6 Q It would be in excess of 500 millirem, wouldn't it, just
7 the gestation period?

8 A 100 percent of the exposure would result in a 15 rem bone
9 exposure, I believe. So it would be 3 percent of that;
10 but that is based on an equilibrium value as to with a
11 long half-life it would take time to reach this
12 equilibrium value. You wouldn't get that all in the first
13 nine months.

14 Q Right. Okay. But -- all right, we will leave that for
15 the time being.

16 Now, have you found what I guess has been marked
17 here today as Exhibit 4, the N-GET Nuclear General
18 Employee Training Manual, page -- well, beginning on Page
19 34 of 71, and specifically I am going to question you
20 about Page 36 of 71.

21 Have you found those pages?

22 A Yes.

23 Q Now, on Page 34, where it talks about -- under 4 c the
24 heading is, "Available alternatives for the pregnant
25 female worker," toward the bottom of the page there.

1 Do you see where I am reading?

2 A Right.

3 Q And it indicates there that the pregnant -- correct me if
4 I am wrong, does it indicate that the pregnant female
5 worker may decide not to accept or continue assignments in
6 areas where radiation levels are high enough for a baby to
7 receive 500 millirem or more before birth? Is that an
8 accurate statement of the policy?

9 A No. This is -- what you see here is the instructions
10 given in the REG GUIDE 8.13 Instruction Concerning
11 Prenatal Exposure.

12 Q All right. Then it is not Commonwealth Edison's policy to
13 allow the declared pregnant woman to make the choice that
14 is listed in c 1?

15 A She -- we make the choice for her in the sense that it is
16 our policy not to expose her to 500 millirem during that
17 period.

18 Q That is what I am asking, all right.

19 Then under where it says c 5, lists -- this is on
20 Page 36 now -- lists the alternative, "Choos to continue
21 working in higher radiation areas with the full awareness
22 that she is doing so at some small increased risk for her
23 unborn child."

24 Again, you do not allow her that choice?

25 A Correct.

1 Q Now, with regard to work in high radiation areas, which is
2 the term -- a term you use on Page 21 of your testimony,
3 Question and Answer 36, what is the procedure for an
4 employee suiting up for such work?

5 THE WITNESS: I haven't found you in my
6 testimony.

7 Page 21?

8 MR. MILLER: Yes.

9 MR. THOMAS: Yes.

10 THE WITNESS: Question 36.

11 BY MR. THOMAS:

12 Q You used the phrase there -- you talk about -- in that
13 question and answer you talk about work in high radiation
14 areas?

15 A In selected high radiation areas.

16 Q An employee -- for work in those areas, an employee would
17 have to be suited up; is that correct?

18 A In general, that's correct.

19 Q Okay. In those situations in which an employee must be
20 suited up, what is the procedure for suiting up?

21 A If he is in areas where there are -- there are two
22 different levels of contamination control.

23 If the levels are low enough in contaminated areas,
24 protective clothing may be nothing more than shoe covers,
25 booties and gloves, and depending on the type of work that

1 he is doing. If he is just passing through an area that
2 might have some contamination on the floor, that would be
3 the requirement.

4 If he was working in areas where he was around
5 contamination where his personal clothing could come in
6 contact with removal contamination, then it would be a
7 full suit-up procedure where the person is instructed to
8 remove his outer garments, shoes, and just in shorts and T
9 shirt he dresses in full protective clothing gear, which
10 is --

11 Q What is the -- I am sorry. I didn't mean to interrupt
12 your answer.

13 Please finish your answer.

14 A -- which includes protective clothing on his head and for
15 his entire body, from the shoes up.

16 Q Is there a procedural order for that full suiting up?

17 A Well, it's not written in the procedure, but it's common
18 sense, if you are going to get your clothes on, they have
19 to be put on in a certain way. He would put on his shoe
20 covers and then his anti-contamination garment, and then
21 after he has that, he can put on his rubbers over his shoe
22 covers. It is a common sense type thing.

23 It is given in the instructions in the N-GET class,
24 but it is something that is not written down in, say, a
25 station procedure.

1 Q Are there any measures to assure that face masks are worn
2 effectively?

3 A Yes. Our radiation work permit that is for jobs in
4 radiation areas exceeding the daily administrative dose
5 limit and on there describes the proper protective
6 clothing and any other protective gear such as respirators
7 and face masks.

8 In individual -- individuals working on the job are
9 periodically checked upon by a specialist or technician to
10 be sure that their face gear is worn properly.

11 Q Are individuals who wear a face mask required to be
12 clean-shaven?

13 A Yes.

14 Q Now, with regard to desuiting, taking off the suit, what
15 order is that done?

16 A The most-contaminated garment to the least-contaminated
17 garment in that order, starting with the outer rubber
18 boots and the outer rubber gloves. The boots come off,
19 then you come across the step-off pad with your shoe cover
20 on. As you remove the boot, you step onto the step-off
21 pad, which is a clean area, and then after the booties,
22 you remove the gloves and then you remove your outer
23 garments, starting with your cap, and you kind of wiggle
24 out of your anti-C's. You end up pulling them inside out
25 when you are done; and then you would come to the next

1 step-off pad where you would remove your inner shoe covers
2 and then your inner glove liners and then you would go to
3 the last step-off pad where you would do a frisk.

4 Q What about the mask?

5 A The mask would come off after removal of the outer rubbers
6 and outer gloves, and you would --

7 Q Would the mask -- I am sorry.

8 A -- and you would pull the mask off in a manner where you
9 would not be exposing your face or the inside of the mask
10 to your inner gloves.

11 Q Would you remove the mask last?

12 A No, the mask would not necessarily be removed last.

13 Q If you don't remove the mask last, aren't you going to
14 contaminate yourself from your own suit?

15 A No.

16 JUDGE SMITH: We will be looking for a suitable
17 opportunity for a break whenever you want to.

18 MR. THOMAS: Any time the Board is -- feels it's
19 appropriate.

20 This would be fine with me.

21 JUDGE SMITH: All right. Let's take a 10-minute
22 mid-morning break.

23 (Recess.)

24 MR. THOMAS: May I proceed?

25 JUDGE SMITH: Proceed, Mr. Thomas.

1 BY MR. THOMAS:

2 Q Just to pick up where we left off, you say you would not
3 require that the face mask be taken off last; is that
4 right?

5 A That's correct.

6 Q Okay. If, after working in a high radiation area, there
7 is contamination on the body, what detergents are removed
8 to -- are used to remove the contamination?

9 A Usually the contamination is removed with just soap and
10 water.

11 Q What if soap and water is not sufficient to remove it?

12 A Then the radiation protection supervision would become
13 involved in taking additional steps to help remove the
14 contamination.

15 The normal procedure is you would wash once with
16 soap and water, and if that didn't do it, you would wash
17 again. You would go through a couple of repeat processes
18 with soap and water.

19 Additional measures that can be used, if it's
20 localized, say, on the hand, you could put a plastic glove
21 on to help sweat the contamination out.

22 Other measures would include putting on potassium
23 permanganate and removal with sodium disulfide.

24 Q What Geiger counts would you allow on the body after a
25 shower after working in a high radiation area?

1 A I am not sure I exactly understand your question, allow.

2 We would decontaminate the individual to background
3 levels. That is the normal procedure.

4 Q What is the procedure if you cannot get down to background
5 levels?

6 A If the levels are low enough, the individual would be
7 allowed to leave the station, and those levels would be on
8 the order of about 100 counts per minute on a pancake-type
9 GM instrument.

10 Q What is the flat plate area of the Geiger counter that
11 gives this reading?

12 A I am not sure I know exactly what you are looking for.

13 Q You don't understand the question?

14 A I don't understand the question in the sense of are you
15 looking for the detector or the covering or the size of
16 the detector?

17 Q I am speaking of the effective cross-sectional area of the
18 detector.

19 A I think it's on the order of around 17, 18 centimeters
20 squared.

21 Q Again, all these questions are in the context of work in
22 high radiation areas.

23 What are the criteria for the use of nose swabs?

24 A That type of contamination check would be done -- if an
25 individual had received contamination on the upper part of

1 the body and in the face region or the head region, we
2 would require nose swabs.

3 If the individual was involved in a job, even if his
4 face was not contaminated but we found contamination
5 inside the mask, we would perform nasal swabs, or if he
6 was in an area without respiratory protection and may have
7 received or is suspected of receiving an uptake, we would
8 do nose swabs.

9 Q How does the employee know that his mask is working
10 properly?

11 A If it's a half-mask, it is checked with a smoke test,
12 smoke test prior to being put on or when issued.

13 If it's a full face mask, then he does the negative
14 pressure test.

15 Q You can't use a smoke test while you are on the job, can
16 you?

17 A At times it is impractical; but the smoke test will be
18 done at least once at the time the mask is issued.

19 Q Right. But that's before --

20 A Then at the job the individual can perform a negative
21 pressure test.

22 Q What do you mean by that; just putting his hand over it?

23 A You would cup your hands over the two filters and
24 determine that the mask kind of collapses around your face
25 as you attempt to breathe in.

1 Q If you can't breathe, then it's working; right?

2 A Correct.

3 Q What are the criteria -- strike that.

4 When, after work in a hot operation, would you take
5 urine samples?

6 MR. MILLER: Could we have a definition of hot
7 operation?

8 MR. THOMAS: For the record, it's after work in
9 a high radiation area.

10 It's the same premise that we have been using
11 throughout this whole line of questioning.

12 A Working in a high radiation area alone is not criteria for
13 taking urine samples.

14 Urine samples or nucleoplasmic is going to be based
15 on working in airborne radioactive areas and to make a
16 determination of any uptake.

17 You could have high radiation areas where you have
18 absolutely no airborne contamination.

19 Q Right. I understand that.

20 But I am asking: What are the criteria for taking
21 urine samples?

22 A The principal means of monitoring internal exposure is
23 using a whole body counter.

24 Urine samples is a supplement to that program and,
25 also, urine samples is used to periodically look for or

1 check on tritium internal exposure.

2 Q Again, the question is: Are there any criteria for when
3 you take urine samples?

4 A I do not know the exact criteria that is in the Byron
5 procedures for taking urine samples.

6 Q What about fecal samples?

7 A The same.

8 Q What about whole body counts?

9 A Whole body counts are required periodically, depending on
10 the individual's work criteria.

11 Individuals who frequent airborne radioactivity
12 areas are required to have at least three whole body
13 counts a year; individuals who have lesser frequencies in
14 those types of area is two; and everyone at the station is
15 required to have at least one whole body count a year.

16 Q Now, I believe that you -- well, strike that.

17 Do you report to -- well, in the context of Byron,
18 would you report to the Byron station manager or do you
19 report to the individual you mentioned at the beginning of
20 your testimony in Edison corporate management or --

21 A I report report to the corporate health physicist, the
22 individual I stated earlier.

23 Q That is Mr. --

24 A Robert Pavlick.

25 Q Mr. Pavlick, all right.

1 Who does he report to, if you know?

2 A He reports to the supervisor of health physics,
3 radioecology and emergency planning.

4 Q For the record, who is that?

5 A John Golden.

6 Q Do you know who Mr. Golden reports to?

7 A He reports to the technical services manager, who is
8 George Wagner.

9 Q Do you know who Mr. Wagner reports to?

10 A He reports to the division vice president of nuclear.

11 Q Who is?

12 A Denny Gellig.

13 Q If you find something irregular, do you have immediate
14 access to top corporate management?

15 A Yes.

16 Q Through what procedures?

17 You go through the regular reporting chain that you
18 have just outlined or is there another procedure?

19 A Normally, we would go through the regular reporting line;
20 but it would not be uncommon for myself to talk directly
21 to George Wagner if the other individual members between
22 me and him were not present.

23 Q Is there an established emergency procedure for that?

24 A There is not something written down directly that explains
25 who I can report to on problems in the area of health

1 physics.

2 Q Again regarding work in areas of high radiation exposure,
3 what restrictions are there regarding food and drink in
4 those areas?

5 A There is no -- it is not allowed to bring in food or drink
6 or smoking or chewing gum in controlled areas.

7 Q It's a total ban?

8 A It's a total ban.

9 Q Does that include both food and drinks?

10 A That includes any type of food or substances that could be
11 taken into the body in controlled radiation areas.

12 Q Now, do you know which ICRP publication deals with ALARA?
13 Can you give me the -- give me the number of the
14 publication?

15 MR. MILLER: Once again, I am going to object.
16 I think this is well beyond the scope of Mr. Rescek's
17 direct examination.

18 MR. THOMAS: This is one of those lingering
19 qualification questions, your Honor.

20 We feel that anybody who is in the position that he
21 is should know the answer to this question, and I will tie
22 it up with the testimony of Dr. Morgan.

23 JUDGE CALLIHAN: What does he mean by deal with?

24 JUDGE SMITH: Off the record.

25 (There followed a discussion outside the

1 record.)

2 JUDGE SMITH: Back on the record.

3 I am sorry. I have just lost complete track now of
4 the question and the objection and the considerations, so
5 let's start again.

6 MR. THOMAS: Okay.

7 JUDGE SMITH: Please be precise in your
8 question.

9 There was some criticism that it was a vague
10 question.

11 MR. THOMAS: Okay. I will.

12 BY MR. THOMAS:

13 Q Can you give me the ICRP publication number for the
14 publication dealing with ALARA?

15 MR. MILLER: My objection was it went beyond the
16 scope of his direct.

17 JUDGE SMITH: Overruled.

18 A I am familiar with ICRP --

19 JUDGE SMITH: Wait a minute. Let's reconsider
20 this.

21 You stated in your recent explanation of the
22 question that you believed that a person such as Mr.
23 Rescek, who deals with the subject matter of ALARA, should
24 be aware of the publication number.

25 The Board would like to know what you mean by deals

1 with, the term deals with.

2 MR. THOMAS: I mean a person who is the lead
3 physics technical engineer of Commonwealth Edison Company.

4 JUDGE SMITH: You may answer the question.

5 A (Continuing.) I am familiar with a number of ICRP
6 publications, including ICRP 26, which deals with the
7 summation of internal and external exposure.

8 I am not -- I don't have a complete familiarity with
9 memorizing the numbers of the publications.

10 I am familiar with the publications and can refer to
11 them and find them in our reference file; but --

12 MR. MILLER: Have you completed your answer, Mr.
13 Rescek?

14 THE WITNESS: Yes.

15 BY MR. THOMAS:

16 Q Do you know who was the author of ICRP Publication 22,
17 entitled, "Commission Recommendations that doses be kept
18 as low as readily achievable"?

19 A I do not know the specific author.

20 Q Do you know what the 1983 dollar value is which the NRC
21 places on one rem to be in conformance with ALARA?

22 MR. MILLER: I am going to object. I do not
23 believe that there is any such value.

24 Unless there is a foundational question asked that
25 establishes that such a value exists according to this

1 witness' knowledge, the question is improper.

2 MR. THOMAS: I don't mind asking the foundation
3 question which he suggests.

4 BY MR. THOMAS:

5 Q To your knowledge, does the NRC place a dollar value on
6 one rem in terms of 1983 dollars to be in conformance with
7 ALARA?

8 A The NRC has come out with some general guidance, as to
9 things back in the '70's, of placing a thousand dollars
10 per man rem as a guideline to use when making a
11 cost-benefit assessment of exposure.

12 Q Do you know what the present guideline is?

13 A I don't recall the exact number. However, with the
14 Commonwealth Edison Ben-fit system, we do not accept fixed
15 dollar amount per man rem.

16 We believe that dollar amount is dependent upon a
17 number of variables and could change on whether or not the
18 work was critical path related or non-critical path
19 related, on the weights of the individuals involved and
20 the exposure rates and the number of people, skilled or
21 unskilled, that might receive the dose.

22 So we think the value is a floating value and we do
23 not utilize a fixed value, whether NRC or anyone else's.

24 Q Thank you.

25 Can you define dose equivalent for me?

1 A Dose equivalent is the -- is equal to the absorbed dose
2 times any modifying factors that may apply for the
3 particular radiation involved.

4 Such modification factor would be -- quality factor
5 for fast neutrons might be 10; and there are also other
6 modifying factors but they are not used. They are just
7 assumed to be one.

8 Q Now, with regard to the processing of the CR 39 badges and
9 the TLD's that you mentioned earlier, I believe you
10 indicated those are normally processed by an outside
11 vendor; is that correct?

12 A That's correct.

13 Q In case of an emergency, does Applicant have the ability
14 to process these themselves rather than sending them out
15 and then waiting for the results to come back?

16 A We have arrangements with Landauer to process badges 24
17 hours a day, seven days a week, if emergency conditions
18 arise.

19 Q Well, how fast could you get the results back under those
20 circumstances?

21 A Depending on the location of the power plant, it would be
22 approximately two to four hours from the time that
23 Landauer would receive the badge.

24 Q And where is Landauer located?

25 A They are located just south of Chicago.

- 1 Q So in the case of Byron, there would be delivery time to
2 Landauer, two to four hours processing by Landauer, and
3 then you could --
- 4 A A phone call.
- 5 Q Then a phone call would be received back?
- 6 A Right. So you are talking the four-to-seven-hour range.
- 7 Q Four to seven hours?
- 8 A Right.
- 9 Q So I take it, then, under emergency conditions
10 Commonwealth Edison does not have the ability to process
11 them themselves; is that right?
- 12 A That's correct.
- 13 Q What meters would an employee wear if he were -- if he or
14 she were to go into an area of high beta and gamma
15 radiation exposure?
- 16 A Could you define the levels of beta with respect to -- the
17 relative levels of beta and gamma?
- 18 Q Say beta of 100 MR per year.
- 19 A 100 millirems per year?
- 20 Q Yes.
- 21 A And the gamma?
- 22 Q Okay. Let's just consider beta first alone.
- 23 Beta of 100 MR per year, what meters would an
24 employee wear?
- 25 A 100 millirems per year, if you divide that out -- I don't

1 have a calculator, but if you divide that in the number of
2 hours in the year, you get the millirad per hour.

3 It would be very, very low, and no special
4 protection or precautions other than normal, routine
5 protective clothing in the area would be required.

6 Q What about 100 MR per hour?

7 A 100 millirad per hour beta, the protective clothing would
8 include -- in addition to the normal protective wear,
9 could possibly include a face shield, if the individual
10 did not normally have a respirator on for that work.

11 Q I am sorry. The question dealt with meters.

12 I don't mean to cut you off, but I was asking what
13 meters would be employed where, not clothing?

14 A He wouldn't wear a meter.

15 Are you talking about a film badge, meters that he
16 wears for personal dosimetry, or meters that he would
17 carry to evaluate the exposure rates?

18 Q We are talking about what he would wear.

19 A Okay. The film badge is the dosimeter that he would wear
20 as the normally official record. In addition, he would
21 have a pocket ionization chamber that he would wear into
22 any radiation area.

23 Q Anything else that he would wear?

24 A No, that's all.

25 Q Does the pocket ionization chamber respond to betas?

1 A No. The film badge responds to betas. Since the pocket
2 ionization chamber doesn't respond to betas, there would
3 also be a hand-held instrument that would be used that
4 does respond to betas, but I didn't mention that since you
5 were specifically referring to things that he wore on the
6 body.

7 Q I understand. That is correct, that is correct.

8 How would the employee know beforehand that the
9 accident would or would not involve beta exposure?

10 A How did you get accident into this is what I mean? What
11 do you mean accident?

12 Q I mean we were talking about going into an area of beta
13 exposure.

14 How would you know beforehand that it involved beta
15 exposure or not?

16 A Individuals just do not go into work areas. Work areas
17 are evaluated by the technicians, trained technicians,
18 before individuals work in them to make an assessment of
19 the types of exposure and the levels of exposure involved
20 for the job.

21 Q Would an employee going into such an area have anything --
22 any type of meter, either worn or carried, which would
23 give a sound warning?

24 A Yes; but those meters, again, don't respond to betas.
25 Those are gamma monitoring instruments and they are

1 referred to in the industry as beepers, and individuals
2 who are working in high radiation areas where that type of
3 instrument is appropriate to allow him to self-monitor
4 himself by hearing the effect of the exposure rate, those
5 beepers are employed and used.

6 Q And what about fiber dosimeters?

7 A Could you repeat that?

8 Q Are fiber dosimeters also used?

9 A Fiber?

10 Q Uh-huh. Do you know what fiber dosimeters are?

11 A Could you clarify that?

12 Q They are meters that have a fiber which moves across a
13 calibrated scale.

14 A That's the pocket ionization chamber which I referred to
15 earlier.

16 Q Are pocket ionization --

17 JUDGE SMITH: Are you still testing the witness'
18 competence or are you going into actual plant practices
19 now?

20 MR. THOMAS: I am going into actual plant
21 monitoring and practices.

22 A That is not a general term of industry to refer to those
23 instruments as fiber. They are referred to as
24 self-reading dosimeters or pocket ionization chambers.

25 BY MR. THOMAS:

1 Q Are pocket ionization readings entered into a permanent
2 record?

3 A Pocket ionization chamber readings are used to establish
4 the permanent record. They are entered into the
5 individual's record and kept there until the results of
6 the film badge can be compared to the pocket ionization
7 chamber, at which point the Form 5 record would contain
8 the results of the film badge.

9 Q And that's a permanent record?

10 A That's a permanent record.

11 Q You previously indicated that the film badges are only
12 used for beta; is that right?

13 A No. They are used -- you just asked me the question of
14 what was used to monitor beta.

15 The film badges are used to monitor beta and gamma.

16 Q What about the TLD readings: Do they also go into the
17 permanent record?

18 A The TLD's are used to monitor extremity exposures. They
19 are typically referred to as finger rings.

20 Yes, the results of them do go into the permanent
21 record.

22 Q Which is the principal permanent record, the film badge or
23 the TLD?

24 A They are monitoring two different things, so they are both
25 the principal record.

1 The film badge monitors the whole body exposure and
2 the TLD is used to monitor the extremity exposure.

3 So they are of equal importance in that sense, but
4 there is -- one does not supplant the other since they are
5 monitoring two different parts of the body.

6 Q With regard to your -- your testimony makes reference to
7 spiked badges, in quotes.

8 What kind of exposure is given to the spiked badges?

9 A We use exposures that tipify the type of exposures that
10 workers receive in the plant. So they would vary
11 accordingly from maybe, say, 50 millirem on the low end
12 going up in increments of a couple of hundred, and you
13 could have some -- we occasionally may do spike badges of
14 values in the one to two R range.

15 Q You expose the spike badges, I take it, to gamma dose; is
16 that right?

17 A The spike badges are exposed to gamma and betas.

18 Q What about mixed beta and gamma?

19 A Yes, there are some spiked badges exposed to both.

20 Q What about neutrons?

21 A I am speaking now in terms of the general practice at the
22 Commonwealth Edison stations and not necessarily specific
23 to the levels and ranges and types of mixed fields that
24 Byron station will expose their spike badges to.

25 Q You don't know what those exposures will be?

1 A I have not specifically reviewed those procedures and have
2 memorized the categories of exposures and the types of
3 spike badges that they intend to do.

4 Q Typically, does Applicant expose spike badges to neutron
5 dose?

6 A It would be -- it is not typical to do that, no.

7 Q What do you use to deliver the spike doses for gamma?

8 A The sources that would be normally used to calibrate the
9 instruments, the NBS traceable source.

10 For example, Zion would have a cesium-137 source as
11 their source, and the badges would be spiked to a known
12 dose via that source.

13 Q Do you or does Applicant enter internal dose information
14 on a routine basis into an employee's record?

15 A Yes. We have a system where we have a whole-body counter
16 onsite. Again, it is leased to us from a vendor.
17 Information is -- whole-body counts are sent to the vendor
18 approximately every two weeks and the results -- the
19 official results -- are supplied back on magnetic tape and
20 then they get entered into the computerized Form 5 record
21 for the individual.

22 Q How do you ensure the accuracy of the results from the
23 vendor?

24 A We have phantom and some calibration sources onsite
25 provided by the vendor that we run through the machine to

1 verify the fit, the computer fit that is done on the level
2 of radioactivity present and also to use, you would say,
3 the positional that shows where the source is at.

4 So the vendor has set up a QA/QC program with us to
5 do a checkout of his equipment.

6 In addition, I think, every 50th or 100th person, he
7 goes through it twice as another type of check on the
8 instrumentation.

9 In addition, the vendor also does various QC/QA-type
10 checks.

11 Q Does the vendor know which instruments are spiked?

12 A Now you are moving off of the whole-body counting system
13 and you are moving over into the --

14 Q Either instruments --

15 A -- dosimetry area now, is that --

16 Q Excuse me a minute.

17 Does the vendor know which whole-body reports or
18 instrument bodies are spiked reports?

19 A On whole-body counts on the tape he would know that this
20 was a source and phantom put through the machine, because
21 the levels of the radionuclides present would not be
22 typical of an individual worker since they would be up in
23 the 100 plus permissible body burden values to give a good
24 spike on the machine.

25 In the area of dosimeters, say, the film baths,

1 those the vendor does not know that they are spiked. They
2 are kept -- that information is not provided to him. So,
3 therefore, it's a blind check that we perform.

4 Q So you are saying the vendor does know with regard to the
5 whole-body, the vendor does know which ones are spiked;
6 right?

7 A He knows when we are running a calibration. That
8 information would be kept on the tape.

9 It is not really a spike. The purpose of that is a
10 calibration check. And it's not a check -- we are not
11 checking to see if he gets the information right. It's a
12 check on the computer programming to perform that type of
13 analysis.

14 BOARD EXAMINATION

15 BY JUDGE SMITH:

16 Q Have you had experience with this vendor in other plants
17 in identifying the so-called spiked reports? I mean, have
18 they identified them and come back with accurate
19 information?

20 You know in advance what the result should be from
21 the vendor?

22 A On the dosimeter, yes, we know, and the results of the
23 spike badge program is fairly good.

24 The vendor does provide an accurate assessment of
25 the spiked dose result.

1 BY MR. THOMAS:

2 Q Regarding internal dose, ICRP gives a total body burden
3 equal to two microcuries for strontium-90.

4 What does this mean?

5 A Could you repeat that?

6 Q Yes. ICRP gives a total body burden equal to two
7 microcuries for strontium-90.

8 What does this mean?

9 A That is the maximum principal body burden that would
10 result in an individual receiving a dose to the body at
11 the limit.

12 Q What dose?

13 A I believe it's 15 rem.

14 Q Does 30 rem sound like it would be correct to you?

15 A That's possible.

16 Q With regard -- on Page 14 of your testimony, question and
17 Answer 25, you indicate that -- well, by implication, the
18 last sentence in that answer.

19 By implication -- correct me if I am wrong but by
20 implication -- a worker would be authorized to exceed the
21 NRC limit in an emergency task, is that correct, the last
22 full sentence on Page 14?

23 A That is correct.

24 Q What emergency would be sufficient to exceed the NRC
25 limit?

1 A A situation of lifesaving actions where an individual was
2 injured or hurt in a high-radiation area, you would be
3 allowed to exceed the regulatory limits in order to save
4 that individual.

5 Q Is that the only exception?

6 A No. There are other criteria given where for less urgent
7 actions, in order to ensure plant safety and plant
8 shutdown, where you have to get at equipment and repair
9 equipment, under those conditions you have -- you can also
10 exceed the regulatory limit.

11 Q Are those exceptions listed in the attachments to your
12 testimony?

13 A They are outlined in the radiation protection standards,
14 which is the first attachment to the testimony, which
15 would be Attachment 2.

16 MR. MILLER: That would be Applicant's Exhibit
17 2, I believe.

18 BY MR. THOMAS:

19 Q Now, on Page 15 --

20 JUDGE SMITH: Would that be the case?

21 MR. THOMAS: I am sorry. What?

22 THE WITNESS: Did you want to refer to it on
23 those emergency dose limits?

24 MR. THOMAS: I wasn't asking you for a specific
25 page reference. I just wanted to know which exhibit or

1 attachment addressed that.

2 You mentioned the criteria, so I just wanted to know
3 generally where they were, which I think you have
4 answered, unless somebody else --

5 MR. MILLER: I am just trying to clarify the
6 record. It was in Reseck's Exhibit 1, which is
7 Applicant's Exhibit 2.

8 JUDGE SMITH: All right.

9 BY MR. THOMAS:

10 Q Is there any dollar value in terms of loss to Applicant at
11 which you would authorize exceeding the NRC limits? Do
12 you know what I mean?

13 A I would like you to clarify that, if you could.

14 Q Well, you know, if you had a situation where Applicant was
15 going to suffer, say, a \$100 loss, would that type of
16 dollar value ever authorize exceeding the NRC limits?

17 A To the best of my knowledge, no.

18 Q Now, on Page 15, Question and Answer 28, you indicate that
19 each radiation worker is required to complete an NRC Form
20 4, which details the workers prior occupational dose
21 history; correct? Page 15, the last full sentence.

22 A That's correct.

23 Q How does Applicant assure that the temporary worker has
24 completed the NRC Form 4 correctly?

25 A It is normal practice to go over the completion of the

1 form in the training program.

2 In addition, when the individual does complete the
3 form, the form is reviewed prior to the individual being
4 issued a film badge. The form is used as --

5 Q Excuse me. What type of review?

6 A Looking over his exposure record and where he was employed
7 and making a determination as to whether or not this is an
8 estimate of the exposure or based on written record.

9 Q Would you have all prior occupational exposure for that
10 employee, the temporary employee?

11 A We would list all of his prior occupational exposure.

12 Q You would get that information from him, also, wouldn't
13 you?

14 A From him.

15 Q Okay. So he would give you the information that you would
16 use to check the accuracy of his completion of the form?

17 A Well, he may, if he is -- depending on who he works for,
18 he may have written termination letters or termination
19 reports in hand when he arrives, at which point it's a
20 matter of copying the values from the one report that was
21 issued by another licensee onto the Form 4.

22 Other cases may involve where an individual does not
23 have a written record with him of this previous exposure,
24 in which he would then estimate his exposure; and then we
25 would do follow-up by contacting the other licensees and

1 first getting a signed release from the individual and
2 then, either be it telecopying or via letter, obtaining
3 the written exposure letter.

4 Q You would also get the other licensees from the employee;
5 right?

6 A Yes, we would.

7 Q So the source of all of this is the employee; is that
8 correct?

9 A Yes.

10 MR. MILLER: The source of all of what?

11 MR. THOMAS: Of all of this information that we
12 have been talking about.

13 BY MR. THOMAS:

14 Q The point is that, obviously, there is a bias for the
15 radiation worker to state a low prior occupational dose
16 history in order to get the job, isn't there?

17 MR. MILLER: I am going to object to that
18 question. That is not obvious to me at all and there is
19 nothing in this record or proposed to be in this record
20 that would support such an obvious statement.

21 JUDGE SMITH: Well, you find some bias on my
22 part. I had that identical question listed to ask him.
23 How do you know the man isn't lying there? There could be
24 economic conditions that would motivate a person to lie to
25 get the job and I will take official notice of that fact.

1 MR. MILLER: I don't know that that is -- with
2 all due respect, I am not certain that it is appropriate
3 to take official notice of that.

4 JUDGE SMITH: I will take official notice that I --
5 all right. Then we will get some expert testimony; but I
6 can tell you, in my experience in the practice of law,
7 that I know that persons in industries will lie about
8 their previous employment. Silicosis workers will do it,
9 pneumoconiosis workers will do it to get employment. When
10 economic conditions are hard enough, they will lie to get
11 that job. I know that.

12 Now, if I need testimony to put in the record, I
13 will get it.

14 MR. MILLER: Judge Smith, it seems to me that
15 the types of radiation workers who are typically transient
16 workers, in most cases, are highly-skilled individuals who
17 are readily able to find employment; but I don't wish to
18 debate the matter with you any further, sir.

19 JUDGE SMITH: I don't think we really have to go
20 into it. How do you know they don't lie?

21 MR. MILLER: That seems to me is a fair question
22 and Mr. Rescek ought to answer it.

23 A Well, you don't know. If an individual writes down an
24 exposure less than what he received and it's an estimate
25 because he does not have appearance papers to back it up,

1 we will pursue with the licensee what his correct exposure
2 was.

3 Now, if the individual lies to the extent that he
4 says he has never been in a radiation work before or never
5 been at a power plant before, then we would not be able to
6 do an investigation to verify the exposure record that he
7 has provided, so that potential, I guess you could say,
8 does exist.

9 MR. THOMAS: May I have a moment?

10 JUDGE SMITH: I will not, of course, bring my
11 previous experiences into the record in this proceeding in
12 deciding that there would have to be evidence here.

13 THE WITNESS: I would like to add, too, maybe
14 that it is not typical that we would hire a large
15 percentage of unskilled workers. Typically it is the
16 skilled worker that we are looking to bring onto the job.

17 I have not been aware of any cases within Edison
18 where we have come to realize that someone has lied --
19 deliberately lied -- on filling out the Form 4.

20 JUDGE SMITH: Do you think that you would have
21 been in a position to become aware of that?

22 THE WITNESS: I think I would have been if it
23 would have been recognized. Now, maybe if the individual
24 lied and got away with it, then no one would know; but if
25 it had been discovered or whatever, at least in my five

1 years of experience at Zion Station, I would have become
2 aware, I think.

3 MR. THOMAS: Now -- I am sorry. Did the Board
4 have anything further?

5 JUDGE SMITH: No, I don't.

6 BY MR. THOMAS:

7 Q Now, you just mentioned your experience at Zion and you
8 indicate that from June of 1978, until May of 1982, you
9 were the lead health physicist at Zion; is that right?

10 A That's correct.

11 Q And during that time the ALARA program at the Zion Nuclear
12 Power Station was found not to have been conducted in full
13 compliance with NRC requirements; is that correct?

14 A Could you specify the document to support that?

15 Q Yes. Specifically there was a health physics appraisal
16 report dated June 27, 1980, which contained a listing of
17 various items where the health physics program was found
18 not to be in full compliance with NRC requirements;
19 correct?

20 A I don't know if you are saying in full compliance because
21 that was a performance audit and what came out of the
22 performance audit was not necessarily noncompliance. It
23 was just identifying programs where improvements or
24 deficiencies exist, but not deficiencies in the extent
25 that they resulted in noncompliance in terms of not

1 following the regulations.

2 Now, there were maybe, I think -- I am not aware of
3 any official noncompliance resulting on the ALARA program.
4 There may have been deficiencies and Significant Action
5 Items raised by the NRC, but not under that specific
6 criteria of noncompliance.

7 Q One of the deficiencies was identified as weak management
8 and management support of the radiation protection
9 program; isn't that right?

10 A That was one of the items that was identified by the NRC.

11 Q Okay. Another of the deficiencies that was identified was
12 that the person representing radiation safety in the
13 highest station counsel had other significant
14 responsibilities which diluted his advocacies for
15 radiation protection; is that correct?

16 A Are you reading directly, are those the direct words?

17 There were inferences made that the job duty was
18 broad, but I am not sure if -- I don't recall if that was
19 the exact words used by the NRC or if those are your
20 words.

21 Q In fact, that was a quote; but was that person that they
22 were speaking about there you?

23 A No, it was not.

24 Q Another deficiency identified at that time was the
25 radiation protection program management was weak at all

1 levels within the station; right?

2 A Again, I am not sure if those are the exact words or not;
3 but there were statements made along those lines.

4 Q And another deficiency was that practical supervisory
5 training appeared to be weak to nonexistent; correct?

6 A Again, "weak to nonexistent," I don't recall if those were
7 the exact words used by the NRC.

8 Q But that was an area that was identified as being
9 deficient; right?

10 A I believe so.

11 Q Okay. And there was also a problem with recurrent acts of
12 vandalism affecting the department?

13 A That's correct.

14 Q Another area of deficiency identified was frequent
15 violation of radiation protection standards; correct?

16 A I believe so.

17 Would it be possible to have a copy of the appraisal
18 audit in front of me?

19 MR. MILLER: I think it's only fair to the
20 witness. Counsel is reading from a document.

21 MR. THOMAS: I have no objection to that, your
22 Honor.

23 JUDGE SMITH: Obviously, you are trying to
24 establish the information and not test his memory on it.
25 I think he should have it.

1 MR. THOMAS: Well, it's really a combination of
2 the two.

3 JUDGE SMITH: What would be the relevance of his
4 memory?

5 MR. THOMAS: Well, established in the
6 information -- well, it's really the former, you are
7 right, you are right.

8 BY MR. THOMAS:

9 Q Referring to Page 7, Section 2.4, entitled, "Management
10 Support," do you see where --

11 A Yes.

12 Q Okay. It indicates -- does it indicate there that the
13 appraisal team believes that symptoms of weak support
14 include frequent violation of radiation protection
15 standards, poor morale and discipline in the department
16 and persistence of poor working conditions among others
17 listed there?

18 A It states that.

19 Q All right.

20 JUDGE SMITH: I am wondering just what you are
21 accomplishing by this?

22 I mean, I understand the information that you are
23 getting into the record, but I don't understand why you
24 feel it is necessary to get him to read it and agree
25 that's what it says. There is a much more direct route it.

1 seems to me.

2 Are you going to question him about these matters
3 after he becomes familiar with them?

4 MR. THOMAS: I was simply planning to bring out --
5 putting it in the argumentative terms, you know, it's easy
6 to come into this hearing room and say that things are
7 going to be fine; but what goes on in reality out in the
8 real world is something else.

9 I was simply doing this by way of contrast to
10 demonstrate that point, your Honor.

11 JUDGE SMITH: Well, this is an NRC report. Now
12 you are getting him to agree that that's what the NRC
13 said. If so, what difference does it matter if he agrees
14 that is what the NRC said?

15 MR. THOMAS: I am getting him to agree that
16 during his period as -- during his tenure as lead health
17 physicist at Zion, the following areas were identified as
18 deficiencies in their ALARA program or their health
19 physics program.

20 MR. MILLER: I think we would be willing to
21 stipulate that whatever the NRC report says were the
22 deficiencies that the NRC identified.

23 JUDGE SMITH: That's where I would suggest you
24 go, because his reading of them is -- well, I have already
25 probably taken more time than it would have taken if we

1 had allowed him to continue, but his reading of them gives
2 it no more or less weight than the report itself.

3 MR. THOMAS: If the Applicant can stipulate to
4 the entry of the report into the record, it will not be
5 necessary.

6 MR. MILLER: I am relatively confident if I can
7 look at it over the lunch hour.

8 MR. THOMAS: Okay. That would be sufficient for
9 us. Then we wouldn't have to take up the time going
10 through each item in the report, although I just plan to --
11 as you say, probably this discussion has taken longer than
12 the rest of the questions would; but I will -- depending
13 upon that stipulation, I won't ask any more questions on
14 that report.

15 Judge, again, subject to following through on that
16 stipulation, I would have no further questions of this
17 witness at this time.

18 JUDGE SMITH: Mr. Goldberg, would this be a good
19 time for lunch break?

20 MR. RAWSON: Judge, I will be handling this
21 issue for the Staff.

22 I have a few very few questions by way of Mr.
23 Thomas' follow-up on cross examination. I can either do
24 it now or bring it up after lunch.

25 JUDGE SMITH: Let's go to lunch now and come

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back at 1:00 o'clock.

(Whereupon at 12:00 Noon, the hearing in
the above-entitled matter was recessed, to
reconvene at 1:00 P. M. of the same day.)

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AFTERNOON SESSION

(1:00 o'clock p. m.)

MR. RAWSON: My name is Richard Rawson. I have just a few questions for you.

CROSS-EXAMINATION ON BEHALF OF COUNSEL
FOR THE NUCLEAR REGULATORY COMMISSION

BY MR. RAWSON

Q Mr. Thomas during a portion of his examination was asking questions about the annual training which workers receive concerning radiation protection and, in particular, whether there were any employees who were exempted from that training.

My notes indicated that you said there were no employees who were exempted from that training.

Do you recall that testimony?

A Yes.

Q Have I characterized it correctly?

A I believe so, yes.

Q Is it your testimony that such employees as radiation chemistry technicians and health physicists are required to attend the annual training that we have discussed?

A That's correct.

Q Can you describe briefly the class of employees who are required to attend that training?

1 A The class of employees?

2 Q Is it everybody who works at the Byron plant, is it some
3 lesser portion of the employees who work at the Byron
4 plant? Is there some way you can qualitatively describe
5 the employees who are required to attend the annual
6 training?

7 A Anyone who will work in radiation areas and who will
8 receive a film badge will be required to go to that
9 training. The only individuals who may not have such
10 training would be, say, visitors to the station who would
11 be visiting the offices and not in the plant.

12 Q Okay. Thank you.

13 Mr. Thomas also asked you some questions about a
14 term or a concept of maximum permissible body burden.

15 Do you recall that testimony?

16 A Yes.

17 Q To your knowledge, do NRC regulations specifically address
18 the term "maximum permissible body burden"?

19 A The NRC regulations address the the maximum permissible
20 concentrations of nuclides permitted to enter in the air
21 and also maximum permissible concentrations allowed in
22 liquids.

23 Q So your responses to Mr. Thomas' questions pertaining to
24 maximum permissible body burden addressed Commonwealth
25 Edison requirements rather than any specific NRC

1 requirement relating to a term "maximum permissible body
2 burden"; correct?

3 A To the best of my knowledge, yes.

4 Q You were also asked some questions by Mr. Thomas toward
5 the end of his examination in relation to a health physics
6 appraisal, dated June 27, 1980.

7 To your knowledge, did Commonwealth Edison take any
8 actions in response to that health physics appraisal?

9 A Yes, they did. They responded --

10 Q I am sorry. Can you briefly describe the actions that
11 were taken?

12 A Yes. I can get a copy of the appraisal again. I can go
13 over the actions taken for each of the specific findings.

14 MR. THOMAS: Again, I have a copy which we can
15 use for purposes of this.

16 MR. RAWSON: We are dealing with just one copy,
17 Judge. I apologize.

18 I will hand it to the witness now.

19 (Indicating.)

20 A There were eight significant appraisal findings that we
21 were required to respond to in separate letter or separate
22 response from any of the noncompliances that were
23 identified.

24 The first one dealt with management and management
25 support of the health physics program that should be

1 strengthened.

2 My personal views are that the management,
3 management support, was not as bad as characterized in the
4 appraisal audit; but a number of steps were taken by
5 Commonwealth Edison in the response to the NRC that was
6 accepted, the first being that a roentgen supervisor was
7 required to attend the superintendent's morning meeting.
8 There was a senior corporate management review from the
9 corporate staff on the management and management support
10 issue. An interim formal ALARA committee was established
11 in September or before September.

12 Before this the ALARA activities were performed by
13 the health physics staff, but subsequent to the audit a
14 more formal type of committee was established within the
15 station.

16 Fourthly, an annual performance review was provided
17 of the radiation chemistry technicians.

18 MR. THOMAS: May I interject just a moment?

19 It appears to me that he appears to be reading from
20 some notes or a piece of paper which is not apart of his
21 prefiled -- if I am wrong, correct me -- but if I am
22 right, I would like to have the paper identified that he
23 is reading from so we know what is going on.

24 MR. MILLER: Maybe there ought to be some
25 questions as to what part Mr. Rescek played in preparing

1 the response of Commonwealth Edison Company to the NRC
2 appraisal that you used in your examination, Mr. Thomas.

3 MR. THOMAS: Fine. I have no problem with that.

4 MR. MILLER: Then I think he ought to identify
5 the notes that he is using.

6 JUDGE SMITH: Is that all right with you?

7 MR. RAWSON: That procedure is fine with me,
8 Judge Smith.

9 A The response to the appraisal findings were prepared --
10 excuse me. The majority of the responses were prepared
11 by myself.

12 Some of the responses that weren't directly for the
13 findings that were not directly in the area of health
14 physics were prepared by the Station.

15 My notes are based on what I can recall about the
16 appraisal audit and I certainly would like to have the
17 company response, which is, like I say, mostly my response
18 here, and read from that rather than reading from some
19 notes.

20 MR. THOMAS: Were those notes prepared over the
21 luncheon recess?

22 THE WITNESS: That is correct.

23 JUDGE SMITH: From memory?

24 THE WITNESS: Not strictly from memory. I
25 talked to the individual who had a copy of the appraisal

1 response.

2 MR. THOMAS: In Chicago?

3 THE WITNESS: Yes.

4 MR. MILLER: If you want to mark those, we have
5 no objection.

6 MR. THOMAS: May I see them for the moment,
7 please?

8 THE WITNESS: Yes.

9 MR. THOMAS: I have no further concerns about
10 the notes, your Honor. I just wanted to clarify the
11 record on that.

12 BY MR. RAWSON:

13 Q Mr. Rescek, do you recall the question and where you were
14 in the response?

15 A Yes.

16 Q Proceed, please.

17 A The fourth item done in order to strengthen management and
18 management support was to provide a formal performance
19 review of the radiation chemistry technician's work
20 performance.

21 Fifth item or the fifth action taken in the
22 management area is to establish or increase the size of
23 the radiation chemistry technician performance staff from
24 I think three to five and also to provide the foremen with
25 some clerical help as identified as a deficiency in the

1 audit; and with five foremen we established
2 around-the-clock foreman supervision of the radiation
3 chemistry work performance.

4 The sixth item was rad tech logbook, so there would
5 be some continuity between work shifts.

6 Seventh, we enlarged the radiation chemistry offices
7 to provide additional work space and a more conducive or
8 pleasant work environment.

9 Eight, the radiation occurrence report system, which
10 was previously reviewed up to the level of the radiation
11 chemistry supervisor for action was changed to require
12 that the assistant superintendent would review all
13 radiation occurrence reports in the plant.

14 And then lastly, we took steps to improve the
15 additional training that RCT's receive and also EA's.
16 Part of that longer term that came out of that was that we
17 did some job reviews of the rad chem technicians or task
18 analysis of the rad technicians or EA's or health
19 physicists in the company.

20 MR. MILLER: Could I interrupt, Mr. Rescek.

21 We now have clean copies of the document. I think
22 it could probably ease everybody's burden of following
23 this.

24 A (Continuing.) The second --

25 MR. MILLER: Do you want to identify the

1 document, Mr. Rescek, that we have been referring to by
2 date and by addressor and addressee?

3 A (Continuing.) This is a letter from Keppler, the Director
4 of Region 3, to Mr. James O'Connor, the President of
5 Commonwealth Edison, and it's dated July -- June 27, 1980,
6 and the subject is the health physics appraisal audit
7 conducted at Zion.

8 The audit was conducted between the periods of March
9 10th to March 21, 1980.

10 JUDGE SMITH: Who is going to volunteer to make
11 it an exhibit?

12 MR. THOMAS: I will ask that it be made an
13 exhibit, your Honor.

14 I think this would be our first exhibit, Intervenor
15 Rockford League of Women Voters Exhibit No. 1.

16 JUDGE SMITH: Are you going to -- as your
17 exhibits unfold, are you going to distinguish between the
18 League and DAARE/SAFE exhibits?

19 MR. THOMAS: I think it would be a good idea.
20 That's normally what I do, you know, just to keep clear
21 for the record who is introducing what.

22 If the Board, you know, wishes us to mark our
23 exhibits jointly, that's okay.

24 JUDGE SMITH: It doesn't matter. Some of your
25 presentations are joint presentations, however.

1 MR. THOMAS: And some of them aren't and this is
2 one that is not, so --

3 JUDGE SMITH: Did you offer it?

4 MR. THOMAS: Yes.

5 JUDGE SMITH: Is there any objection?

6 MR. THOMAS: By stipulation.

7 MR. MILLER: No objection.

8 MR. RAWSON: No objection.

9 JUDGE SMITH: The exhibit is received.

10 (Intervenor Rockford League of Women Voters
11 Exhibit No. 1 was received in evidence.)

12 BY MR. RAWSON:

13 Q Mr. Rescek, I think the ball is back in your court.

14 Had you finished your response to my question?

15 A I finished my response only to the significant Appraisal
16 Finding No. 1, management and management support. I
17 listed nine items. Those nine items apply to improving
18 that management and management support. Significant
19 Appraisal Finding No. 2 is vandalism affecting the health
20 physics program and this was corrected by establishing
21 round-the-clock foremen supervision of the radiation
22 chemistry technician work group, requiring that labs and
23 storage areas for health physics supplies be kept locked
24 and also established security personal personnel to
25 investigate any future cases of vandalism.

1 Since the appraisal audit, vandalism dropped off
2 significantly and that problem was rectified almost
3 immediately through those three steps.

4 The Appraisal Finding No. 3 dealt with inadequate
5 emergency response capability; and corrective actions
6 there involved the -- we had a revision to the GSIP dated
7 July 1, 1980, which required additional quarterly drills.
8 There were four quarterly drills required. One would be a
9 medical drill, then the response of the rad tech
10 technicians to first-aid and decontam, and in-plant and
11 environmental HP drills; so the establishment of drills
12 improved the performance of the rad chem technicians
13 training.

14 We also redefined the use and equipment that was in
15 our emergency trailer. Some improved ventilation and
16 filtration was put in for the accounting room and we also
17 made an assessment of a potential problem on -- there is a
18 dumbwaiter that goes between the hot lab to the primary
19 sample room and the issue was raised as to during an
20 accident with high reactor coolant activity that gases
21 could go from the primary sample room to the hot lab, but
22 ventilation studies showed that would not be a problem.

23 No. 4, on appraisal findings was greater control of
24 access of high radiation areas is required in order to
25 avoid overexposures and account for personnel, and the

1 corrective action was there the Station put R-Key in
2 force, the R-Key procedures, which is the radiation or the
3 high-radiation control key.

4 The fourth appraisal finding was that greater
5 control of access to high radiation areas is required in
6 order to avoid overexposures and to account for personnel;
7 and the corrective actions taken by the Station was to
8 re-emphasize with the plant personnel the requirements of
9 the radiation or the high-radiation-control key procedure.

10 We have -- all high radiation areas in the plant are
11 kept locked and the procedure is that you have to obtain
12 the key from the shift engineer and so corrective action
13 was to reinforce the requirements of that procedure.

14 The fifth significant appraisal finding was on
15 radiation protection problems associated with a possible
16 reactor accident in the area of processing liquid rad
17 waste in the currently used temporary demineralizer
18 system. At this particular time during the audit, Zion
19 Station was processing their rad waste with a portable
20 demineralizer with soft or temporary hoses running to the
21 demineralizer and back out, and the concern of the NRC was
22 during an accident these hoses, which possibly could
23 rupture or could leak, could be a large source of
24 radiation exposure.

25 The corrective action there was the Station was

1 building a rad waste annex or an additional structure to
2 the rad waste facility to house this demineralizer system,
3 and on completion of the annex the demineral would be hard
4 piped rather than soft piped.

5 In the meantime, until the structure was built,
6 procedures were put in place to address isolation of this
7 system during any type of reactor accident to ensure that
8 the system was isolated.

9 Item No. 6 was that there appears ample reason to
10 suspect unmonitored leakage from the gaseous waste system,
11 particularly from the cover gas system. The NRC's concern
12 was whether or not the gas decay tanks and the cover
13 system was leak-tight; and the corrective action, there
14 was the tech staff established a monitoring problem
15 conducted daily to do a balance check on the levels in the
16 tanks, in the pressure tanks.

17 New nitrogen supply instrumentation was installed in
18 order to perform these checks and additional plant testing
19 was incorporated.

20 In addition, the company hired a consultant to do a
21 study on whether or not the waste gas system was being
22 operated in a correct manner or in the best manner that
23 would be possible; and based on that study, to my
24 knowledge or whatever, they didn't find any deficiencies
25 that I am aware of in how they operated the system.

1 No. 7, contamination control should be improved in
2 order to reduce the potential for personal exposure and
3 inadvertent removal of contamination from controlled
4 areas.

5 A number of steps were taken by the Station to
6 correct this item. The first one was they went from -- we
7 went from three accesses, access points into the auxiliary
8 building, which is the controlled radiation area of the
9 plant, to a single access point where all people would
10 have to access and exit and ensure that adequate frisking
11 and survey was accomplished.

12 The station men were made available to the rad chem
13 department in order to do -- in order to perform rapid and
14 additional decontamination of any plant areas or cubicals
15 that had become contaminated. So the rad chem department
16 had more available help in terms of people who would do
17 decontamination of floors made available.

18 In addition, we established periodic surveys and
19 inspection programs to survey all contractors tools and
20 gang boxes in the auxiliary building and to perform weekly
21 surveys of the maintenance tool crib which was in the
22 turbine building and, lastly, improved portable monitoring
23 equipment was installed at the plant to provide additional
24 sensitivity on people exiting controlled areas and exiting
25 the Station.

1 Appraisal Finding No. 8, the ability to sample,
2 detect and measure alpha activity and effluents in the
3 plant environs should be improved.

4 Here is another area where I feel that the appraisal
5 finding is worded a little stronger than the conditions
6 that were found.

7 The concern here from the NRC was whether or not the
8 accounting room, which is under the radio chemistry group
9 rather than health physics group was adequate in order to
10 monitor for transuranic and health activity.

11 Additional surveillance items were employed by the
12 Station.

13 Weekly gross alpha of spent fuel pool water was
14 incorporated and transuranic of quarterly deposits of
15 all late discharge samples, spent fuel pool water and a
16 variety of smears taken in and around the containment and
17 fuel pool area.

18 Before the new surveillance there had been other
19 surveillors. The HP health physicist group was conducting
20 special quarterly composites of area buildings in the fuel
21 samples and containments and auxiliary building and
22 sending them off to transuranic.

23 Also, some direct coolant sample at the time of the
24 appraisal audit was taken and sent to Argonne for analysis
25 and the results of those analyses found there wasn't any

1 transuranic present.

2 That concludes the actions taken by the Station on
3 each of the appraisal -- eight appraisal -- findings.

4 Subsequent to the audit, the NRC inspectors during
5 their normal licensing inspection reviewed the follow-up
6 actions taken and the corrective actions taken by the
7 Station and found them to be satisfactory.

8 MR. RAWSON: May I have just one moment, Judge?

9 Judge Smith, the Staff has no further questions of
10 this witness.

11 Thank you.

12 BOARD EXAMINATION

13 BY JUDGE COLE:

14 Q Mr. Rescek, you responded to several questions about the
15 spiked badges and you did comment on certain of your
16 experiences with that and your comment was that it
17 generally indicated that the laboratories were doing their
18 job.

19 What percentage of the total number of badges are
20 artificially spiked or does that vary? What is the range
21 for that, sir?

22 A We during non-outages might process four 500 film badges
23 in a two-week period; and during outages we may process up
24 to a couple of thousand badges in a two-week period.

25 Typical badge spike program at Zion I think spikes

1 around 12 to 16 badges, say, in a two-week period, so the
2 percentage is very, very small.

3 Q All right, sir. Who examines --

4 A However --

5 Q Go ahead.

6 A However, our spike program is not the only QA check on the
7 laboratory. The laboratory also, as stated in the
8 testimony, submits badges to various testing facilities
9 and also maintains a QA check on their performance.

10 Q All right, sir. You don't know what fraction of the
11 badges? Just 12 to 15 out of 500; is that about the
12 average?

13 A That would be representative, I think.

14 Q All right, sir. Then who actually looks at the results to
15 make a determination that they are satisfactory?

16 A It would be a health physicist. It would be a health
17 physicist on the Staff of the Station.

18 Q Do you happen to know what guidelines he uses to determine
19 whether they are satisfactory?

20 A I wouldn't know the exact guidelines any station may have
21 employed to make that. I am not aware. I don't know off
22 the top of my head the specific numbers in the station
23 procedures that would establish a percentage criteria
24 difference between the spiked dose and the response; but,
25 typically, on the order of plus or minus 25 percent would

1 be, I think, a typical number that you would look at.

2 Q But you don't get directly involved in that?

3 A In my present position I haven't been. At this time I
4 have only been in my position about nine months.

5 I have not been involved as yet. However, we are
6 looking at establishing performance standards in this
7 area, and I would -- I believe that the company from a
8 corporate position will have some input to standardize
9 this at all the stations, probably in the next year or
10 two.

11 Q All right, sir. Thank you.

12 On Page 2 with respect to Edison's record keeping
13 program, in item Roman 5 C2 it is stated that you maintain
14 information for each worker at a nuclear station, the
15 estimated current exposure status for all personnel by
16 work group is maintained.

17 Could you tell me something about work groups, how
18 they are determined, how many there are, what is the
19 approximate size of work groups?

20 A Work groups are divided into more than just the
21 classification that the NRC has on the REG GUIDE 116
22 reporting.

23 We divide work groups up into the various
24 specialties of maintenance activities.

25 For example, mechanical maintenance is one group

1 work, electrical maintenance is another work group.

2 Within the chemical maintenance we will divide that
3 work group up into A, men, welders; B, men and helpers, so
4 we are able to look at people's jobs and look at specific
5 aspects of their jobs and categorize those workers
6 together rather than treating a helper on a maintenance
7 staff compared to a welder on the maintenance staff.

8 So I believe there are about 20 major, major work
9 groups of which there are divisions within them.

10 Q Are the records kept by both groups and subgroups?

11 A Well, the maintenance group would be together.

12 For example, you would have a code, say, 1220 for
13 maintenance and then 1221 would be A, men, 1222 might be
14 B, men, 1223 might be helpers or whatever. So that when
15 the printout comes, it would be all together and it would
16 go down to the maintenance foremen office, so they would
17 be able to look at all of their workers collectively and
18 they would be alphabetized within the subgroups.

19 Q All right, sir. On Page 11, Question 20 of your
20 testimony, Mr. Rescek, Question 20 refers to the
21 cross-check of film badges and pocket ionization chamber
22 data. You indicate that this is done at the end of each
23 biweekly period.

24 Who actually does this, sir?

25 A It's initially done on a computer printout where the

1 pocket ionization chamber readings that are entered every
2 day for the worker are totaled and then that value is
3 compared to the results from the -- from land hour batch
4 processor and then if there is a mismatch of 100 millirem
5 between the two numbers, you would get a printout saying
6 that the following badges were mismatched from the pocket
7 ionization chamber totals; and then from that printout it
8 would be looked at by the health physics staff and it
9 would be the responsibility of the lead health physicist
10 at each station to ensure that those mismatches were
11 reviewed and corrected or resolved as appropriate.

12 Q So the way in which that check is there, there is an
13 automatic computer printout of a 100-millirem difference?

14 A Right.

15 Q And then it's checked.

16 Who actually looks for that? Who determines -- who
17 looks at the printout to determine whether there is, in
18 fact, an identification of that?

19 A The initial printout would come to the engineering
20 assistant, who is -- who does the day-to-day input
21 handling of the dosimetry data.

22 However, it is incumbent upon the lead health
23 physicist to ensure that those mismatches are investigated
24 and resolved.

25 Q How does he do that?

1 A Well, mismatches may be resolved because, for example,
2 there may be computer entry errors or there might have
3 been the badge from Landauer did not come back or was
4 non-processed or lost or there might have been a lost film
5 badge.

6 So some of the initial items that are checked would
7 be done by the engineering assistant.

8 If those things do not identify the source of the
9 error, then further checks may be done by one of the
10 health physicists on the staff to review the daily pocket
11 ionization chamber readings for the individual and to
12 review maybe surveys or work assignments and then try to
13 identify whether it is a problem with the pocket
14 ionization chamber readings or whether it is a problem
15 with the film badge.

16 Q How often do those kinds of problems occur in your
17 experience at Zion?

18 A During non-outages, the mismatches are -- I would hesitate
19 to give you a number as to how many there are, but there
20 are not that many.

21 During outages it would not be uncommon to have
22 50-plus mismatches out of a thousand-or-so-plus badges, of
23 which you have to check.

24 Now, some of the mismatches may be due to large
25 exposures. If the exposures were for, say, one rem or

1 higher, well, then the mismatch of 100 is a much small
2 percentage and it may be judged within the error band of
3 pocket ionization chambers versus the film badge.

4 Q Okay. On Page 13, in response to Question 23, the last
5 part of that, of your response, said, "The corporate
6 health physics staff also is responsible for program
7 development and trending of occupational exposure data."

8 Could you describe to me how they do that, sir?

9 A Program development is --

10 Q I am particularly interested in the trending.

11 A We trend occupational exposure dose totals for the
12 station, the annual station dose totals, as well as the
13 annual dose totals for three-week groups. I think we look
14 at contract workers, station workers and station total, I
15 think, are the three, the three categories; and what the
16 trending is is to identify and look at how the exposures
17 are changing year to year for each station and then
18 looking at it and identifying as to maybe why exposures
19 have gone up or gone down.

20 Now, there aren't -- there isn't any formal
21 procedure to state specifically what we do with that
22 trending information other than it's a management tool or
23 a corporate health physics management tool to look at
24 exposures at the Station.

25 Q On an annual basis you get one value per year and you

1 compare it? You have to wait until next year to get
2 another value to compare it with to determine if you have
3 a trend?

4 A I guess we should state that we treat records of the
5 annual station total each two-week period. The badges are
6 processed on a biweekly basis, so you do have numbers.
7 You do have 26 numbers coming in for a year that you look
8 at; but it's difficult to look at the individual numbers
9 and that in and of itself doesn't tell you too much. You
10 have to look at, well, this two-week period they went into
11 an outage, so you are going to expect that. During this
12 previous two-week period from the previous non-outage
13 period that the number is going to jump significantly.

14 Now, the corporate health physics staff is looking
15 closely at establishing some type of tool to use this
16 data, it is the corporate ALARA group and the corporate
17 ALARA group is active now in trying to make this a more
18 effective tool to look at management -- to look at
19 management of exposure at the stations; but the numbers in
20 and of themselves have to be correlated with the type of
21 work activities and the type of activity -- not just the
22 work activities but the scope of the work that the Station
23 is doing during the two-week period.

24 Q Well, how often does the corporate ALARA group look at the
25 data to determine whether there are, in fact, trends that

1 should be investigated?

2 A To my knowledge right now, he is looking at that data and
3 he is also trying to correlate the exposure data at
4 Commonwealth Edison with the exposure data for the rest of
5 the country of the PWR's and BWR's and he is developing
6 some computer programs to make these comparisons to see
7 why we are running higher and why another PWR is not
8 running higher and to review and discuss with the other
9 utilities as to what contributed to their high exposures
10 or why they had lower exposures in a given year.

11 I do not have firsthand information as to exactly
12 the type of work that he is particularly doing in order to
13 put this program together now.

14 Q Well, the reason why I pursued that, sir, is you started
15 out by saying you look at annual data and I got the
16 impression you looked at one year's data and then compared
17 it with the next year average; but from what you just
18 said, that is not the case; is that correct, sir?

19 A The annual is looked at, but, also, in addition to the
20 annual being looked at, the corporate ALARA program is
21 looking at exposures over shorter periods of time.

22 Now, whether you can look at it on a biweekly basis
23 and get some meaningful information out of it is depending
24 on whether or not you can correlate that dose to specific
25 work and type of work that is being done at the Station,

1 because if you are in an outage, you are going from one
2 week of having low exposure to the next week of having
3 high exposure and you might say oh, that might at first
4 blush be a negative type of trend; but then you look and
5 find out, well, during that week they are doing various
6 type of outage work and so they can reasonably account for
7 why they had the increase in dose.

8 Part of the ALARA program and the corporate ALARA
9 program on trending occupational exposure is the corporate
10 ALARA offers -- he will be reviewing the Station ALARA
11 goals with respect to radiation exposure.

12 Q Well, I guess does the corporate health physics staff or
13 the corporate ALARA group maintain a continuous vigil over
14 this data that is generated every two weeks and do they
15 look at that for trends on more than an annual basis; do
16 you know that, sir, do you have any information about it?

17 A To the best of my knowledge they do, yes.

18 Q You talked before, sir, about an NRC Form 4 and also an
19 NRC Form 5 are mentioned in your testimony.

20 Now, with respect to determining what the dose
21 history is of an individual, you indicated that someone
22 applying for a job, if he had been working in the nuclear
23 field at some other location, would fill out an NRC Form 4
24 and you indicated that sometimes they come with records
25 from their previous employer, did you not, sir? Do you

1 recall that?

2 A Yes.

3 Q What records would he have from his previous employer?

4 A He would have his complete exposure history with him for --

5 Q Is this a --

6 A For example, a Westinghouse employee would be coming to
7 work on, say, sludge glancing. Well, Westinghouse
8 employees workers that are transient in the sense that
9 they are working from plant to plant but they might be --
10 but they are Westinghouse employees and they maintain a
11 complete occupational exposure record and he would have --
12 you know, it might be five, six, eight pages thick, but he
13 will have his exposure record with him and he can look at
14 his current quarterly material exposure and his yearly
15 dose.

16 Q Is this a formalized document that is signed by an
17 official of the Westinghouse company or --

18 A Yes, it is.

19 Q -- or does the employee himself maintain this?

20 A No, it's a formal document signed by the company.

21 Q Now, what about employees or contractors or employees that
22 come from other than Westinghouse or GE; is this a
23 standard form that is utilized in the industry?

24 A No. Each -- the form may be different for each company.

25 There are other skilled transient workers, such as skilled

1 radiation chemistry technicians who are hired for their
2 expertise, and they will normally come with a document,
3 say, a termination letter from the previous plant that
4 they had worked at or it may be that the company itself
5 maintains its own formalized form that has this record on
6 it; and then you would have the case of maybe a welder who
7 doesn't have his termination letter from his previous
8 employment and comes in and says that he worked up at
9 Plant A and he worked, he believes, from this time and he
10 estimates his exposure to be a given amount.

11 At that point in time we bring out a document that
12 asks him to sign a waiver so that we can send off to the
13 Plant A and get a copy of his official dose record.

14 Q All right, sir. Thank you.

15 On Page 17 you refer to a Radiation Evaluation
16 Program.

17 Who runs the program? Who is in charge of the REP
18 Program, the Radiation Evaluation Program?

19 A That comes under the corporate ALARA coordinator.

20 Q I have just got one final question and it's got some
21 preliminary remarks to make and then I am going to ask you
22 a question.

23 Our job is to evaluate an ALARA program on paper.
24 It's not an easy thing to do because so much of a program
25 depends upon the enthusiasm and aggressiveness of the

1 people that operate, maintain and manage the program.

2 Is there anything that you would like to say in
3 addition to what you have already said and what is
4 contained in your testimony that would help us get a --
5 help me get a better feeling for the enthusiasm and
6 aggressiveness by which your company will pursue an ALARA
7 program?

8 A Yes. I would like to, if you look at the ALARA manual
9 itself -- and I think that the company, from top
10 management on down, has established a company policy that --
11 I can read you the formal management policy of the company
12 towards the ALARA program and you can get a flavor as to
13 top management's viewpoint.

14 The company raised --

15 MR. THOMAS: Again, is this part of a document
16 that was previously filed?

17 THE WITNESS: I guess I have it in my own notes.
18 This would be company policy stated in the ALARA manual
19 which would be attachment --

20 MR. THOMAS: To your testimony?

21 THE WITNESS: -- to mine it would be.

22 MR. MILLER: Applicant Exhibit 3.

23 THE WITNESS: Applicant Exhibit 3.

24 A On Page 1, the company's ALARA policy statement is as
25 follows.

1 "Occupational radiation dosage to the individual and
2 the sum of doses received by all exposed workers at
3 Commonwealth Edison Company's nuclear facilities is to be
4 kept as low as is reasonably achievable, ALARA, consistent
5 with station construction, maintenance and operational
6 requirements, as well as economic and social
7 considerations.

8 "Commonwealth Edison's management commitment to this
9 policy is reflected in station design careful preparation
10 and review of station operating and maintenance
11 procedures, instruction of personnel and review of
12 equipment design to incorporate the results of operating
13 experiences."

14 To give you kind of a further flavor of the
15 company's commitment in this area is to look at the types
16 of people that are on the corporate ALARA organization,
17 and the chairman, if you go to Page 3 of the corporate
18 ALARA review committee, is the Division Vice President for
19 Nuclear Stations is the Chairman for the Company, and you
20 have top management within the company also serving on the
21 committee such as the Station Nuclear Engineering Manager,
22 the Manager of Station Construction, Manager of Projects,
23 Production Training Manager, Operations Manager Nuclear,
24 Maintenance Manager Nuclear, Technical Services Manager
25 Nuclear, Supervisors of Health Physics and Emergency

1 Planning, Technical Supervisors Nuclear, Health Physics
2 and Technical Services Nuclear and our coordinator.

3 BY JUDGE COLE:

4 Q Sir, going to the question about that.

5 Is there any view to incorporate anybody, on the
6 corporate review ALARA committee, anybody from outside the
7 company?

8 A Not formally on the committee. However, we have
9 consultants who prepare the manual and so we have hired
10 consultants to look at our ALARA program and help us
11 develop our ALARA program and I would believe that if the
12 need occurred, we would have the consultants continue in
13 that process. In fact, even as late as -- as a few months
14 ago a consultant has been -- who helped develop the manual --
15 has been called in to help us with revisions and
16 enhancements of the benefit costs computer program that
17 was developed.

18 With respect to the Station organization, if you
19 look at nuclear stations on Page 8 of the ALARA manual,
20 you see that the top station management on down is
21 committed to the ALARA policy, starting with the chairman
22 being the Station superintendent and then having the three
23 assistant superintendents for operations, maintenance and
24 for technical support administration and then the
25 radiation chemistry supervisor, who is -- who supervises

1 the lead health physicist and the health physics group and
2 the Station ALARA coordinator who reports outside of the
3 radiation chemistry group and reports directly to the
4 assistant superintendent of administration and technical
5 support.

6 So I think the first thing you look at is you look
7 at how the organization is structured and the -- is
8 structured and how with the policy statement of the
9 company is towards ALARA.

10 I think you see that Commonwealth Edison has taken a
11 very strong company and management support to this -- to
12 this ALARA commitment; and then you look at the types of
13 the people who have been put into the ALARA coordinator
14 roles at the Station and the corporate level.

15 The corporate level person, the corporate ALARA
16 coordinator, has been a previous rad chem supervisor at
17 design, two years before being assigned to that level and
18 he has a number of years, ten-plus year's experience in
19 the area of rad waste and chemistry and health physics.

20 You look at the ALARA coordinators that you have at
21 the Station and all of these people are -- have had, to
22 the best of my knowledge, numbers of years of experience
23 at Zion where I am familiar with -- the ALARA coordinator
24 was a health physicist for several years in the health
25 physics groups, also worked in the training department for

1 a number of years as a training instructor and has come
2 back and worked in the ALARA coordinating position and
3 then he subsequently has left; and then another individual
4 who was a previous RCT, a rad chem technician, who has
5 worked his way up into management, who has put in a number
6 of excellent years in the area of radiation chemistry work
7 and not years just in the management but he came out of
8 the bargaining unit with the technician group, so he has a
9 very good flavor as to the type of work that is actually
10 being done in the plant, having done it from day-to-day
11 for like five or six years.

12 So I think you have to look at management's
13 commitment and the type of people who are being selected
14 for heading up these groups.

15 Then you look at the type of work that has come out,
16 and I am not familiar personally with all the ALARA work
17 that is being done throughout the system, but I have seen
18 a number of work efforts that have been done at Zion, and
19 Zion was one of the first utilities to use reactor edge
20 shielding, blanket-type shielding on the reactor head to
21 recuse exposure for head tensions and detentions for the
22 reactor head removal job. You are looking at the type of
23 activities that Zion did during the steam generator
24 repairs, where they actually brought in steam generator
25 mock-ups outside of the Station and actually provided

1 additional one- or two-days training to everyone going
2 into the steam generator and this training in the mock-ups
3 is done with protective clothing and respirators and it's
4 done exactly as if the job was being done, and it's a
5 large company expense to do that kind of mock-up training.

6 So I think that if you put all of these things
7 together, I think the ALARA program is very favorable
8 compared to the industry standards.

9 JUDGE COLE: All right. Thank you.

10 JUDGE SMITH: There is a question here.

11 BOARD EXAMINATION

12 BY JUDGE CALLIHAN:

13 Q It has been apparent from the filings that there are a
14 number of witnesses by the Applicant -- there will be a
15 number of witnesses by the Applicant in this area.

16 At this risk of fragmenting the record I am going to
17 direct to you a number of questions which really may not
18 be in your area of expertise and certainly not your area
19 of specialty. So do not hesitate to respond by saying
20 that can be or will be addressed by someone else later in
21 this program.

22 On the other hand, we are in a position of not
23 wanting to lose you; and if we don't ask you, we may never
24 get an answer, so please keep that in mind.

25 You made reference to various radiation-detecting

1 instruments, one of which you designated as a CR 39, and
2 my question is: What is the sensor in a CR 39?

3 A That's a carbonate compound that has been designated CR
4 39. I think it's allyl diglycol carbonate and it's -- I
5 don't know if it's a manufacturing term or what. It's
6 just and referred to as CR 39 and it's sensitive to fast
7 neutrons and intermediate range neutrons. The neutron
8 interacts with the material and causes hydrogen and carbon
9 recoils in the material. These tracks that are left by
10 these recoils can then be etched and counted, and based on
11 the number of tracks you have an idea of what the flux was
12 and what the exposure was.

13 Q So it's an organic carbonate and the methodology is --

14 A Track recoil.

15 Q -- is track detection?

16 A Right.

17 Q True?

18 A Yes.

19 Q Thank you. You have also made reference to a rem meter.

20 How does it work?

21 A That's a round-ball-type substance that is used -- that
22 has a moderator around the detector that is used to
23 moderate the neutrons, and the size effect is such that it
24 moderates neutrons from the fast and intermediate ranges
25 in the moderation so whether the instrument responds it

1 responds relatively correctly the actual or true dose rate
2 no matter what the energy ranges of the neutrons.

3 Now, there is -- it's not going to be perfectly
4 accurate, but it's going to be reasonably accurate for the
5 power reactor neutrons energies that exist, and the
6 detector inside is usually a -- it can be a BF₃ tube that
7 would respond to the neutrons, the thermalized neutron
8 that has hit the detector, that gets through the ball.

9 Q Is it a rate device or is it an integrating device?

10 A It can be both depending on the instrument that is
11 attached to the detector and ball. It can be integrating
12 if it's -- normally, we use it in the rate mode, but it
13 can be either way depending on the type of instrumentation
14 that is attached to the detector.

15 Q Is this a modification of or in any way related to a
16 Bonner Ball or are you familiar with that?

17 A Yes, it's directly related to that.

18 Q I would like to come back to the matter of training, and
19 quite unnecessarily remind you that we have a tome known
20 as Applicant's Exhibit No. 4, which must represent or
21 consist of on the order of 100 sheets, which is entitled,
22 "Instructor's Guide," and I would like to note -- excuse
23 me, "Instructors Guide for Nuclear Generator Employee
24 Training," and I would like to know how that fits into
25 this training program that we understood you to say

1 earlier -- perhaps erroneously -- that was of a duration
2 of one day? I would like to know how the instructor goes
3 about presenting this information in that period?

4 What is your -- what is your training program; and
5 as a corollary to that direct question, who learns all
6 this information that is in this tome?

7 A Maybe to try to --

8 Q At least who are exposed to it?

9 A The training as it is conducted with instructors and also
10 in addition they will use slides or maybe film tapes to
11 provide this material in that time frame.

12 It is a fast program. A lot of material is covered.
13 However, the information that -- information maybe more
14 important -- parts of the information might be more
15 important than other parts.

16 For example, areas that they may key on and give
17 some special attention to or a little more time to would
18 be the areas of radiation signs. Individuals are required
19 to know what irradiation is and recognize the sign for it
20 and what a high radiation area is so inform; that is
21 directly related to individual safety, is maybe emphasized
22 stronger. So I think that they go through the whole
23 program and that individual is given a test after covering
24 this material, but then the testing of that material does
25 focus in on the aspects surrounding the individual being

1 able to enter the plant and not to get himself in any type
2 of problem with unfamiliarity with radiation equipment or
3 radiation signs, so the emphasis -- heavy emphasis -- is
4 placed on the pragmatic and practical aspects of the job;
5 and then the material, the theory, is also covered, but
6 it's not so heavily tested as the practical aspects.

7 Q I know I am bordering on a staff question, but I will be
8 repetitious to the extent of saying -- of asking what
9 group of employees is exposed to the training as described
10 by Applicant Exhibit 4?

11 A To the best of my knowledge, all employees who work at the
12 Station are exposed to the information covered in this
13 training guide.

14 Q Clerical?

15 A Yes.

16 Q Maintenance?

17 A Yes.

18 Q All?

19 A Yes, all.

20 Q Now, what do you do for your, I will say, specialists or
21 those people who, by design, are potentially subjected to
22 radiation exposure?

23 A We have a number of different ways in which people who
24 frequent those areas get additional training; to take the
25 most skilled specialists in the area of radiation

1 protection would be the radiation check stream technician.
2 Now, this addition to this material, he is also -- the
3 company has developed a generic, I think it's 17- or
4 18-week coarse that would be done outside the Station for
5 people who are coming from, say, a maintenance department
6 or a station man department or an operating bid who had
7 bid on becoming a technician. Well, these people aren't
8 just given technician jobs. They are first sent to
9 training and the training is on the order of 17 to 18
10 weeks of classroom instruction where they learn theory and
11 the practical aspects of health physics and chemistry and
12 are trained in all of the radiation health chemistry
13 procedures and radiation physics procedures; and then
14 prior to going to work they put four to six weeks
15 on-the-job training. So that is where you have maybe the
16 most training given in radiation protection for an
17 individual working in the plants.

18 Then people, say, in the operating groups who go
19 through a licensing class, well, they are also in
20 licensing class; they are given training in the area of
21 health physics. Part of the licensing exams concern 10
22 CFR 19, 10 CFR 20 requirements, so operating personnel,
23 shift engineers, people who hold senior reactor operating
24 licenses and reactor operators are given additional
25 training in the department in the area of health physics

1 and chemistry.

2 Q I think you have just said -- and I ask if I am correct in
3 my understanding that -- this extended 17-week compared to
4 one day training is offered to and presented to both
5 supervisory personnel as well as members of the bargaining
6 unit?

7 A No. The 17-week training is the training that is provided
8 radiation -- future radiation chemistry technicians.

9 Q Are those members of the bargaining unit?

10 A Yes.

11 Q Returning to appendix -- I mean Applicant's Exhibit 4,
12 which is your Appendix 3, is that supplemented, is the
13 oral and visual presentation supplemented by handout
14 material or are people asked to take stuff home for
15 perusal?

16 A There is a -- at Zion there was a pamphlet that would be
17 given to the workers that would, again, define the size
18 and would define the areas, the assembly areas, show them
19 where the assembly areas are and would define
20 contamination control areas and radiation areas and high
21 radiation areas, so I am aware that Zion does have a
22 supplement. Whether all the stations have a supplement I
23 am not sure.

24 Q You recited earlier an organization chart which terminated
25 at its upper end, if I may so characterize it, at a Vice

1 President?

2 A Division Vice President.

3 Q And that is a corporate organization that you outlined?

4 A Yes.

5 Q Is there not also a Byron organization?

6 A Yes.

7 Q And is it true that we shall have an opportunity to learn
8 of that from somebody else afterwhile?

9 A Yes.

10 Q Thank you. You have remarked about extensive record
11 keeping of exposures and, as I understand it, both
12 individual and woman to man, as well as by the group,
13 various groups.

14 Are those records available for inspection by the
15 individual employee, and by that I mean can someone come
16 up to his supervisor and say, "How much exposure have I
17 been subjected to?"

18 A Yes. It is common for the supervisor of the department to
19 post those records so that his people can review them on a
20 daily basis, if they so desire.

21 Q Does --

22 A And if that is not posted, the individuals certainly can
23 ask at any time either his supervisor or come into the
24 health physics office and get an up-to-date reading of his
25 exposure.

1 Q So the corporation does take the initiative but the
2 individual concerned can be inquiring in his own right?

3 A Sure.

4 Q Referring to this radiation history that accompanies
5 employees or individuals who change jobs and so forth
6 about which there has been much discussion -- do I make
7 myself clear thus far?

8 A Yes.

9 Q -- is there any recognition in that radiation history of
10 what an individual has -- what individual -- what exposure
11 an individual has incurred from what I call and will
12 define if necessary as natural background?

13 A No, we do not keep a record of any natural background or
14 medical exposure, and that does not count towards his
15 occupational exposure.

16 Q So that doesn't enter into your record keeping or
17 evaluations or anything like that?

18 A That's correct.

19 Q Thank you. Early in your testimony, namely on Page 1 and
20 in some earlier discussion today, you are designated as a
21 Power Reactor Certified Health Physicist.

22 There was mention of the -- of a classification of
23 another kind of health physicist as certified by some
24 organization.

25 What was the name of that other health physicist, do

1 you recall?

2 A Yes. The American Board of Health Physics has two
3 certifications, a broad, health physics certification,
4 which prior to receiving you are tested in the areas not
5 only of power reactors but in the areas of medical health
6 physics and accelerator, and you have a broad training and
7 broad health physics experience and you pass a
8 certificational exam that us covers the whole range of the
9 health physics field. That is just listed -- they just
10 list that as Certified Health Physicist.

11 Now, the power reactor specialty is also offered by
12 the American Board of Health Physics, so your
13 certification title is Certified Power Reactor Health
14 Physicist. So the difference in the titles is just adding
15 those two words.

16 The scope of the testing in the area of the
17 specialty is the same. You are both required to take a
18 Part 1 examination that is identical for both fields or
19 for both certification and then you take the -- Part 2 is
20 different for the power reactor specialty, the Part 2 test
21 is an essay test, I think about four hours long or
22 something like that, where you are only tested or only
23 given essay questions dealing with power reactors but you
24 must -- and if you pass that test, then you receive a
25 certification just in the area of power reactors.

1 Q Can you tell us and, if so, will you tell us the genesis
2 of the certifying board? Is it part of a technical
3 society or government or who is behind it?

4 A It's the Health Physics Society; the National Chapter of
5 the Health Physics Society is the group that is kind of
6 the collective group for health physicists, and then the
7 American Board of Health Physics, I believe, comes under
8 the or is affiliated with the society.

9 Q Being very impersonal in this question, let me assure you,
10 what would an individual who is certified as a power
11 reactor health physicist have to do or learn or what not
12 to become the broadly Certified Health Physicist? And
13 while you are on that, you might think about: Is there a
14 gradation, is one type of certification at a higher level
15 than the other and if so, which way?

16 A I don't really believe that the one certification is
17 higher than the other. I think it's just -- if you have
18 got the broad certification, it means that as a consultant
19 or as an expert, you can speak in the area of, say,
20 medical health physics or say accelerator health physics.

21 If you have the power reactor specialty, you can
22 still speak in the area of power reactors and the types of
23 questions that the individual who passes the broad
24 certification. The type of questions he must answer in
25 the area of power reactors are no different or

1 substantively harder than the type of questions that the
2 power reactor health physicist must answer in order to
3 pass his specialty. So in you are restricting the
4 expertise to power reactors. It's no different or there
5 is no advantage, really, to have a broad certification
6 over power reactor certification.

7 Q Thank you. Perhaps, there is another upcoming
8 representative who can address the following. I will let
9 your counsel decide, as well as yourself, of course.

10 What I am seeking is a defense of the statement on
11 Page 3 of your testimony that, broadly speaking, and,
12 perhaps, too loosely speaking, that your ALARA program is
13 founded on the linear radiation model; and if you care to
14 address that, I would be delighted.

15 If there is someone else coming along who that fits
16 more appropriately, you might pass that.

17 MR. MILLER: Dr. Callihan, Dr. Fabrikant, who
18 will appear, I believe tomorrow, I think, will be prepared
19 to discuss the theoretical underpinning for the use of the
20 linear hypothesis for radiation protection, but perhaps
21 Mr. Rescek can tell you how it's applied on a day-to-day
22 working basis by the company, if that is of interest.

23 JUDGE CALLIHAN: It's the foundation that I am
24 seeking, not necessarily application, without prejudice,
25 of course, to the present witness. So we will hold that

1 one.

2 BY JUDGE CALLIHAN

3 Q You refer to a quote "administrative daily dose limit,"
4 unquote.

5 A We have administrative limits for daily and weekly dose
6 equivalent.

7 The daily limit is 50 millirem and the weekly limit
8 is 300 millirem.

9 To exceed those limits requires interaction and
10 approval by the health physics supervisor.

11 Q So this is kind of a permissive dose limit?

12 A For example, if the work group is going to work in an area
13 where the exposure is very low, from an administrative
14 standpoint, they get their radiological conditions and
15 requirements from the radiation protection office.

16 However, if the individuals working on that job are
17 going to exceed this administrative daily limit, not only
18 would they just get the radiological protection
19 requirements, they would have to fill out a radiation work
20 permit, a more formal document, that clearly defines the
21 radiological conditions with survey data and defines the
22 respiratory and protective equipment controls as well as
23 defining the exposure limits that individuals working on
24 the job can receive.

25 It's a cutoff point at which we take a much stronger

1 active involvement from the health physics group with the
2 work.

3 Q This question is --

4 A I might add one other thing.

5 If the job is in areas where there is respiratory,
6 fresh-air equipment for flame cutting, welding and
7 grinding, and there is a potential for external uptakes,
8 even though there may be very low exposures and maybe it
9 only receives a five or ten millirem for that job, if
10 those contamination conditions exist and they are heating
11 the material, then that also would require a radiation
12 work permit.

13 So you could end up with a radiation work permit in
14 addition to the requirement for just the 50 millirem or
15 higher.

16 It would depend on the controls required for the
17 job.

18 Q The immediately following has been addressed by even
19 members of the Board, but I want to come back to it.

20 On Page 16 of your testimony, the answer to Question
21 29 again talks about radiation and recording and so forth,
22 and along about the middle of that paragraph reference to
23 a report, which is generated, and I am quoting, "which
24 gives the estimated current exposure status for all
25 personnel by work group," unquote.

1 Are you with me?

2 A (No response.)

3 Q I am sorry. Page 16, the answer to Question 29.

4 A Uh-huh.

5 Q In the -- well, I began quoting --

6 A All right, all right.

7 Q You are with me?

8 A Yes.

9 Q It's the meaning of the word "all," and this may be a
10 quibble, I will admit.

11 All personnel, meaning each member of the group
12 individually or all personnel collectively within the
13 group?

14 A Each individual in the group.

15 Q Thank you.

16 There has been or, I emphasize, will be probably
17 some inquiry into what I will call temporary workers and
18 we will define them, because I have forgotten the term of
19 the trade that describes them; but these are individuals
20 who are used for operations resulting in radiation
21 exposure and then they are replaced by others and so
22 forth.

23 What fraction of the total employees of some place
24 in your experience -- Zion, for example -- is comprised of
25 that type of temporary worker as I have defined it?

1 A It can vary. During non-outages, the temporary worker
2 fraction would be a very small portion. My guess is the
3 transient worker is, you know, maybe a few percent, and I
4 am referring to not long-term but the worker who comes and
5 does his job and leaves a day later or a week later.

6 During outages, the transient worker dose can go up,
7 but it would depend on the type of work being done during
8 the outage.

9 So I think it's a difficult question to put one
10 number on.

11 I think it's a range of numbers. It may be anywhere
12 from 5 to 10 percent to as high as 30, 40 percent,
13 depending on just the type of work that is being done.

14 Q Thank you.

15 One final question. Is it corporate policy in your
16 experience to have, at a particular plant or plants in
17 general, visitations from time to time, no doubt
18 periodically, by, quote, outside experts, unquote, to kind
19 of look over your shoulder on your health physics or other
20 safety to the public issues? Is this done with some
21 regularity?

22 A Are you referring to the experts being hired or contracted
23 by Edison to come in or are you referring to experts who
24 come in, for example, the industry has, by the
25 establishment of INPO?

1 Now, INPO comes in with their experts in the area of
2 radiation safety to provide a listing of areas where
3 improvements can be made as well as to recognize good
4 performance areas.

5 This is a utility-sponsored group, so certainly INPO
6 fits into that category.

7 Then in addition we have American Nuclear Insurers,
8 who provide radiation or health physics specialists who
9 come in to review the station's health physics programs
10 and provide input in terms of where improvements can be
11 made or deficiencies may be.

12 Then aside from those two groups, you have the NRC
13 and then you have the State of Illinois representatives,
14 who would come in as an independent of the utility,
15 performing inspection audits.

16 Q I was really not asking about or interested in
17 governmental inspection groups, into which I put the NRC.
18 I was thinking of independent technical, scientific,
19 industry groups; and I think we have understood each other
20 on that.

21 You have suggested you have INPO; and who looks at
22 you from your health physics point of view?

23 I think you --

24 A INPO looks, also American Nuclear Insurers looks, at our
25 health physics.

1 Q INPO does that, also?

2 A Yes.

3 In addition, we have also had consultants come in
4 from time to time.

5 For example, in the ALARA area we did hire
6 consultants to look at our program and we also hired
7 consultants to look at the division of work within the
8 radiation chemistry department to give us a report to
9 evaluate whether or not chemistry technicians and health
10 physics technicians should remain as, say, radiation
11 chemistry technicians or whether we should have separate
12 AG techs and straight check stream techs, so we have hired
13 consultants in to look at those kinds of things, too.

14 Q You have been guilty of acronyms.

15 Tell us what INPO is, please.

16 A Institute for -- jeez.

17 Q Nuclear --

18 A Nuclear Power Operations.

19 Q Nuclear Power Operations.

20 I wanted to be sure we got that in the record.

21 A I have been handling so many names and numbers today, so
22 things are --

23 Q And, really, lastly on this, these reviews, to which you
24 have most recently alluded, are by non-corporate people;
25 true?

1 A True.

2 We do have corporate reviews, corporate QA reviews,
3 of the station's health physics programs, to ensure or to
4 verify that they are following station procedures and
5 company procedures and policies in the area of health
6 physics.

7 JUDGE CALLIHAN: Thank you very much.

8 That is all I have.

9 JUDGE SMITH: Is there any cross examination on
10 the Board questions?

11 MR. RAWSON: No, sir.

12 MR. THOMAS: I just have one or two questions.

13 CROSS-EXAMINATION ON BEHALF OF INTERVENORS

14 ROCKFORD LEAGUE OF WOMEN VOTERS

15 BY MR. THOMAS:

16 Q Mr. Rescek, does Com Ed have a long-range training program
17 for health physics technicians?

18 A Yes. The generic training program that the company has
19 developed and is initiating this year, this spring, is
20 that -- is a long range --

21 Q So there is none at the present time?

22 A There is not a generic training in the sense that there is
23 one training for technicians, whether they be from Byron,
24 Zion, Quad City station.

25 Each station has this training program, classroom as

1 well as on-the-job training; but it hasn't been made
2 generic.

3 Q How long is the contemplated generic training program
4 going to be?

5 A I believe it is on the order of 17 to 18 weeks classroom
6 training.

7 Q How long is, if you know, the average station training
8 program at the present time?

9 A At Zion I believe the training that was done was also on
10 the order of 18 weeks.

11 I am not familiar with the length of the training
12 programs at the other operating stations.

13 Q But at Zion it was about the same as the contemplated
14 generic program?

15 A Yes.

16 Q Must applicant's health physics technicians pass a written
17 examination?

18 A They pass periodic examinations through the training
19 program.

20 You know, for example, in the area of mathematics or
21 health physics or chemistry, as they progress through this
22 18-week program, they will be given examinations, and it's
23 possible to -- if you are not performing, to flunk out of
24 the program well before the 18 weeks or it's possible to
25 flunk out near the end, so --

1 Q Is there a comprehensive written examination at the end?

2 A To the best of my knowledge, there is a comprehensive
3 examination.

4 Q Is not, you say?

5 A To the best of my knowledge, I think there is.

6 Q Oh, there is.

7 Are you sure about that?

8 A I am not 100 percent sure; but, in addition to that,
9 before an individual can become a permanent technician, he
10 must also fill out a qualification card and demonstrate
11 his understanding of the procedures and how to carry them
12 out, and the qualification card has to be signed off by
13 the radiation chemistry supervisor, who has an opportunity
14 to ask him questions and determine whether or not he feels
15 the applicant or the trainee is -- has satisfactorily
16 learned the required information and has demonstrated his
17 ability to perform.

18 Q Now, you indicated that your certification by the American
19 Board of Health Physics did not cover, for example,
20 medical health physics, which would be the effects of
21 radiation on human beings; is that right?

22 A No. I think what I am referring to there, in terms of
23 medical health physics, is health physics programs
24 established for individuals who are receiving therapeutic
25 type exposures and the like, so I am looking at the health

1 physics program that might be established at a hospital.
2 I am not referring to the general biological effects of
3 radiation.

4 That material is covered in my graduate work, and I
5 don't --

6 Q Your graduate work --

7 A At University of Michigan in radiological health.

8 Q Would you consider yourself an expert in the field of the
9 effects of radiation on man?

10 A No, I would not consider myself an expert, but I would not
11 consider myself a layman, either.

12 Q Does Applicant, to your knowledge, have any certified
13 health physicians, certified by the American Board of
14 Health Physics, the broad certification?

15 A Does anyone in the company have?

16 No.

17 Q One last question.

18 The corporate ALARA policy that you read in response
19 to a question from the Board, I take it that there was the
20 same or similar corporate policy in effect at Zion in 1980
21 at the time of the health physics appraisal that you have
22 spoken to?

23 A There was an ALARA policy.

24 I don't think it was as extensive as the one I read
25 and, in addition, there was not the formal ALARA

1 organizations either at the corporate end with management,
2 with high management representatives, or at the station
3 end.

4 The ALARA activities at the station was under the
5 auspices of the rad/chem department.

6 Q But in 1980 didn't Applicant have a, in your opinion,
7 strong ALARA -- a strong commitment to an effective ALARA
8 program, also?

9 A We have had a strong commitment to ALARA, yes; and, also,
10 I think the stations without the formal ALARA organization
11 have done a number of ALARA activities and ALARA work that
12 would show the ALARA program to be reasonably good, in my
13 estimation.

14 Q And that was the program in effect at the time of the
15 health physics appraisal at Zion; right?

16 A That's correct.

17 MR. THOMAS: I have no further questions.

18 JUDGE SMITH: Mr. Miller.

19 REDIRECT EXAMINATION

20 BY MR. MILLER:

21 Q Mr. Rescek, you went through a line of questioning from
22 Mr. Rawson regarding the health physics appraisal at Zion
23 and you responded with your analysis of the company's
24 response to each of eight identified findings by the NRC.

25 To your knowledge, Mr. Rescek, are each of those

1 corrective actions which you identified applicable to the
2 Byron station?

3 A Most of the findings are not applicable to the Byron
4 station.

5 Some of them could be not applicable from the
6 standpoint of deficiencies, but some of the corrective
7 actions that we have taken will be a part of the normal
8 Byron program, a lessons learned type thing, where we have
9 taken additional -- for example around-the-clock
10 supervision, was that --

11 Q I am sorry. I am not hearing you. You better speak into
12 the microphone.

13 A A number of steps or corrective actions that were taken at
14 the Zion plant will be or would be incorporated throughout
15 the system.

16 So that some of the lessons learned from the Zion
17 station will certainly become a part of the initial
18 program out at Byron.

19 Q Once again, you were questioned by, I believe, Board
20 members and counsel with respect to various training
21 programs.

22 On one extreme we have the N-GET program for all
23 employees at the station, that's one day; the rad/chem
24 technician program that -- I think you said the generic
25 program is 17 to 18 weeks.

1 Are there any training programs for personnel who
2 are involved in either radiation protection activities or
3 maintenance activities or operational activities at the
4 station that fall somewhere in between those two extremes?

5 A Yes, there are.

6 We have station men. When they -- after having
7 completed the N-GET course and their station activities,
8 we would provide them additional training in the area of
9 laundering, protective clothing, how to survey the
10 clothing and segregate the clothing before it goes into
11 the laundry, how to monitor the clothing that comes out of
12 the laundry.

13 And this program is done not only -- this training
14 is not only given in the training program but also is
15 augmented by the station health physicist providing
16 additional training for the work groups. The station
17 health physicist may provide additional instructions on
18 activities to, say -- it's not uncommon to have meetings
19 with the maintenance department before an outage, to have
20 meetings with the contractor work groups before an outage,
21 to go over again how the radiation work permit system
22 works, go over again the radiation protection standards.

23 Contract technicians who come into the site are
24 required to read the radiation protection standards and
25 are tested on the standards by the station health

1 physicists or other health physics members of his staff,
2 and they must pass that test, and this is -- I am
3 referring now specifically to Zion. I don't -- some
4 stations don't require the use of additional, say,
5 radiation chemistry technicians, whereas Zion, in the
6 past, has.

7 So Zion has looked at ways to improve their
8 performance.

9 Operating personnel I mentioned receive additional
10 training in their operating course work regarding
11 radiation safety.

12 In addition, we have what we call proficiency
13 training or mock-up training.

14 I mentioned to you the training that we provided the
15 steam generator workers at Zion using mock-ups.

16 Mock-ups are also used in the maintenance groups to
17 perform various activities in order to learn how to
18 perform the job in a non-radiation area and practice their
19 work prior to going onto the job.

20 So you look at, I guess -- you have the basic N-GET,
21 you have some additional training that augments that and
22 you have what I would call proficiency in the mock-up
23 training that you would give your workers to lower
24 exposure.

25 Q Mr. Thomas and Chairman Smith discussed with you the

1 reliability of the radiation exposure records that you may
2 get from a worker who has been employed at another
3 location.

4 Do you recall that examination, sir?

5 A Yes, I do.

6 Q Mr. Rescek, is there any alternative, which you are aware
7 of with respect to learning about a person's prior
8 exposure history, other than asking the individual for the
9 appropriate records?

10 A Other than asking the individual, if the individual can
11 give us the licensee's name, we do have the means to get
12 that record; but if the individual does not provide us
13 with any type of record and claims never having to work at
14 a licensee, then, no, there isn't any sure means of
15 finding out.

16 Q The NRC or some other agency doesn't provide any sort of
17 centralized computer record for radiation exposures for
18 individuals?

19 A The industry is looking at establishing a record to
20 maintain for transient workers to resolve that potential
21 problem; but as of yet, there is no place that we could go
22 to that has a clearinghouse of that information that I am
23 aware of.

24 JUDGE SMITH: You referred in your written
25 testimony to an NRC 4 form.

1 Is that form designed to facilitate such a
2 clearinghouse if that should come about?

3 THE WITNESS: I don't believe that that form was
4 originally designed for that purpose.

5 The form was designed in order to assess the
6 individual's lifetime exposure, so that if you are going
7 to -- if you want to take the individual above the 1.25
8 quarterly rem limit to a maximum 3 rem per quarter, you
9 must make an assessment of that individual's exposure and
10 compare his lifetime exposure with his age versus
11 subtracting off the age of 18, assuming that the
12 individual is kind of building up a bank account where he
13 can receive so many rem each year.

14 So the purpose of the NRC Form 4 was to review the
15 lifetime dose and then make a determination, based on
16 that, whether or not he can go over the 1.25 millirem
17 limit quarterly up to the 3 rem limit.

18 BY MR. MILLER:

19 Q I would like to switch subjects again.

20 Early in Mr. Thomas' examination, he asked you about
21 the means by which thermal neutrons are monitored at the
22 Byron station.

23 Could you describe for us generally the location
24 within the plant where neutron exposure of any sort is
25 likely?

1 A At PWR's the source of neutrons is inside the containment
2 structure, and most of the neutron flux is inside the
3 missile barrier.

4 At the Zion plant -- Zion was one of the stations
5 that Cattell Northwest conducted a study at for the NRC to
6 make an assessment of the neutron radiation levels and the
7 neutron energy spectrum that existed in power plants.

8 They have done -- they went through and did about
9 four or five PWR's in the country, one of them was Zion,
10 and the results there show, because of effective shielding
11 during the construction phases of the plants, that the
12 levels of neutron radiation are very low inside the
13 missile barrier and exceedingly low outside the missile
14 barrier.

15 I think outside the missile barrier you were talking
16 on the order of one to four or five millirem per hour.
17 Inside the missile barrier at power operations you were
18 seeing neutron levels that were well below the gamma
19 radiation levels.

20 So you have a condition where people are not
21 receiving large exposures to neutrons.

22 Individuals do not typically enter the missile
23 barrier at power while the reactor is running.
24 Individuals do enter the containment outside the missile
25 barriers, but then, again, the radiation levels are

1 exceedingly low; and the energy spectrum on these
2 measurements showed that the bulk -- the overwhelming
3 majority of the exposure is due to intermediate range
4 neutron energies, and the best of my memory, they fall in
5 the area of around 8 to a couple of hundred, 250, keV.
6 Somewhere in that range accounts for the majority.

7 So I look at the thermal neutron dose component as
8 being, in my estimation, probably on the order of less
9 than 1 percent; and then, again, you are looking at levels
10 of a couple of millirem per hour outside the missile
11 barrier.

12 Entries inside the missile barrier are very
13 infrequent and account for well, well less than 1 percent
14 of the plant's exposure in a year's time.

15 I could not give you exact numbers, but it just is
16 not a practical problem.

17 Those environments at power are not conducive to
18 work from a standpoint of heat as well as radiation
19 levels.

20 Q Now, Mr. Rescek, do you remember Mr. Thomas quizzing you
21 about what the principal radionuclide would be in the
22 blood following a neutron exposure accident? Do you
23 recall that?

24 A Yes, yes.

25 Q Do you personally have resources available to you within

1 Commonwealth Edison Company to answer such a question?

2 A Yes, we do. We have all -- we have a library that
3 contains the NRRP's, the ICRP's and a variety of references
4 and textbooks in health physics.

5 That information can be found, as well as SCEAR
6 reports and UNSCEAR reports, so we do have a library for
7 this information; but I would not consider it typical for
8 a power reactor health physicist, where you don't have the
9 criticality accident concern that you do outside the power
10 reactor industry, to maybe know some of these things; and,
11 again, certainly, exposures that are overexposures, it's
12 company policy that the medical department would be the --
13 would be responsible for making those types of assessment.

14 Q Again, you were asked about the ICRP publication which
15 refers to the ALARA concept.

16 First of all, what does ICRP stand for, just so that --

17 A International Commission on Radiation Protection.

18 Q To your knowledge, Mr. Rescek, does the International
19 Commission on Radiation Protection have a regulatory
20 authority over the exposures for workers in nuclear power
21 plants in the United States?

22 A No, they do not.

23 Q Now, then, can you tell us what the NRC regulation is that
24 refers to ALARA?

25 A The NRC has reference to ALARA in 10 CFR 20 that requires

1 that an ALARA program at the stations exist and also the
2 NRC has provided Regulatory Guides 8.8 and 8.10 that
3 address ALARA.

4 MR. MILLER: If I might have just a minute, I
5 believe I am finished.

6 I have no further questions.

7 JUDGE CALLIHAN: I return, with considerable
8 apology to everybody, but there is one point I think we
9 might make for the record.

10 BOARD EXAMINATION

11 BY JUDGE CALLIHAN

12 Q We spoke earlier of your monitors -- I mean your
13 reviewers, not radiation monitors; and you mentioned INPO.

14 Can you tell us what INPO is?

15 Is it a government agency, for example?

16 A It's an industry sponsored agency, sponsored by the
17 utility industry.

18 JUDGE CALLIHAN: Thank you.

19 JUDGE SMITH: Is there anything further?

20 (No response.)

21 JUDGE SMITH: You may step down.

22 Thank you.

23 Were there any other questions for this witness?

24 MR. THOMAS: I didn't have any others.

25 MR. RAWSON: Not from Staff, your Honor.

1 JUDGE SMITH: This would probably be a good time
2 for the afternoon break, unless you have another approach.

3 MR. MILLER: No, that is perfectly acceptable to
4 us.

5 Our next witness will be Dr. Conway from
6 Westinghouse.

7 (Recess.)

8 (Witness sworn.)

9 JUDGE SMITH: Dr. Conway has been sworn.

10 MR. MILLER: Before we begin with Dr. Conway's
11 examination, I would like to introduce to the Board, the
12 other parties, Ms. Gwen Herrin of our office.

13 Ms. Herrin will be conducting some of the
14 examination of the witnesses on this contention and will
15 be appearing from time to time with us here as well.

16 JUDGE SMITH: Welcome. I think we will just be
17 seeing your nose, but welcome.

18 MR. MILLER: Let the record reflect that Dr.
19 Conway has previously been sworn by the Board Chairman.

20 Your Honor, with the Board's permission, I would
21 like to conduct a brief supplementary direct examination
22 of Dr. Conway.

23 In reviewing his testimony yesterday evening, it
24 became apparent to me that many of the physical features
25 of the steam generators, which are described in his

1 testimony, were not known to me -- that is, their location
2 and I sense that the Board, and perhaps the other parties
3 as well, might have the same problem.

4 We have prepared two slides, which are attached to
5 Dr. Conway's testimony on steam generator tube
6 degradation, so they will become a part of the evidentiary
7 record.

8 I have additional copies for the Board and the
9 parties who don't already have them; and I thought, with
10 the Board's permission, I would project them on the screen
11 and ask Dr. Conway to identify the physical location of
12 some of the features that are described in his testimony.

13 JUDGE SMITH: May I suggest, also, that he
14 attach these figures to this testimony, too. We will
15 simply have it bound in at the end of this testimony.

16 MR. MILLER: That certainly will be fine. I
17 will be glad to do that.

18 LAWRENCE CONWAY

19 called as a witness by counsel for Applicant, having first been
20 duly sworn by the Chairman, was examined and testified as
21 follows:

22 DIRECT EXAMINATION

23 BY MR. MILLER:

24 Q Dr. Conway, would you state your name for the record,
25 please?

1 A Lawrence Conway.

2 Q By whom are you employed, Dr. Conway?

3 A Westinghouse Electric Corporation.

4 Q Dr. Conway, do you have before you a document that is
5 headed, "Testimony of Dr. Lawrence Conway Concerning
6 Reduction of Occupational Radiation Exposure"? In the top
7 right-hand corner it bears the legend, "Edison, 2-21-83;
8 2-15-83 version corrected by incorporating errata."

9 A Yes, I do.

10 Q By whom was that document prepared, sir?

11 A Myself.

12 Q Are there any further changes or corrections that you wish
13 to make to this testimony?

14 A None.

15 Q Now, Dr. Conway, I call your attention to two drawings.
16 The first one is entitled "Figure 1," and in the upper
17 right-hand corner it has the identifying numbers 4016-1,
18 the second of which is entitled "Figure 2." and bears the
19 legend "Model D 4 Steam Generator."

20 Can you tell us, sir, what part, if any, you had in
21 the preparation of those drawings?

22 A I prepared both of those drawings.

23 MR. MILLER: Judge Smith, at this point in time
24 I would like to move that Dr. Conway's testimony be
25 accepted in the record as if read and that the two

1 drawings, Figure 1, with the identifying number 4016-1,
2 and Figure 2, Model D 4 Steam Generator, be admitted into
3 evidence as Applicant's Exhibits 5 and 6 respectively.

4 MR. THOMAS: Judge, I have only a technical
5 objection at this point, which would be simply that he
6 identify Figure 1 and 2, the exhibits, as true and
7 accurate representations of whatever they purport to
8 represent, just to complete the record.

9 He said he prepared them, whatever they are; but for
10 the record --

11 MR. MILLER: I would be happy to ask those
12 supplementary questions.

13 BY MR. MILLER:

14 Q Dr. Conway, can you tell us first what Figure 1 purports
15 to represent?

16 A It's a schematic outline of the steam generator containing
17 sufficient elements to be able to understand the
18 kinematics of the behavior of the steam generator.

19 Q And can you tell us what the Figure 2 purports to
20 represent?

21 A It is the vertical section through the preheat steam
22 generator, and the particular model is a Model D 4 steam
23 generator.

24 Q Returning to Figure 1 for just a second, does that purport
25 to be a representation of any specific Westinghouse model

1 steam generator?

2 A No, it is not.

3 JUDGE SMITH: Mr. Miller, even though these are
4 two documents which normally would be regarded as
5 exhibits, I think it works much better if you just attach
6 them to testimony as if testimony. Then it would be right
7 there in the transcript where they are being discussed.

8 MR. MILLER: We will do that, sir, and supply
9 them to the reporter in that form.

10 JUDGE SMITH: I found that that really works
11 quite well, if you don't mind.

12 So we will have not have an exhibit number.

13 MR. MILLER: Fine.

14 JUDGE SMITH: I myself made the mistake of
15 giving a Board document an exhibit number used in that
16 fashion, but that was in error.

17 MR. MILLER: I would like now, with the Board's
18 permission, to conduct a brief supplementary direct
19 examination; but might I inquire as to whether the
20 testimony and the two exhibits have been received? Is
21 there any further objection?

22 JUDGE SMITH: The testimony and the two figures
23 as they are are received without objection, the figures
24 being a part of Dr. Conway's testimony.

25 Excuse me. Did you indicate that these very same

1 figures will also part a part of later testimony?

2 MR. MILLER: Yes, sir, Part of his testimony.

3 JUDGE SMITH: They are just being placed here to
4 put this testimony in context, this present testimony in
5 context?

6 MR. MILLER: Yes.

7 BY MR. MILLER:

8 Q Dr. Conway, I would like to call your attention to Page 5
9 of your prepared testimony where you discuss the design
10 features that have been incorporated in the Byron steam
11 generators to reduce occupational exposure by eliminating
12 or reducing areas where radioactive crud sources could
13 accumulate, and if you will switch on the machine for us,
14 if you could point to the portions of Figure 1, which have
15 been projected on the overhead projector, where the areas
16 where radioactive crud sources could accumulate, in fact,
17 are?

18 A The primary areas for accumulation of crud sources is the
19 hemisphere at the base of the steam generator called the
20 channel head.

21 This is a cast iron vessel clad with stainless
22 steel. The hot side is separated from the cold side by a
23 vertical Inconel plate. The upper portion of this chamber
24 of both, two chambers, is a large plate called -- a tube
25 sheet this is called. The tubes are attached to the tube

1 sheets after passing through holes.

2 This assemblage of parts forms the primary locations
3 for the accumulations of crud.

4 Q All right, sir.

5 Your prepared testimony, Page 6, discusses first
6 certain welds of the tube to the tube sheet.

7 Could you point out on Figure 1 where those welds
8 are found?

9 A They are found at the lower end of the tube on the lower
10 face of the tube sheet. They are the means for attaching
11 the tube to the tube sheet.

12 There are several thousand tubes in each steam
13 generator design and, therefore, twice as many welds
14 because of the U-shaped nature of the tube.

15 It had been practice to protrude the tube beyond the
16 lower face of the tube sheet and then fill in the gap with
17 a 45-degree weld between the tube sheet face and the tube
18 itself.

19 This, then, left myriad pockets across the face of
20 the tube sheet. because of the several thousand protruding
21 tubes.

22 For the Model 4 steam generators, we eliminated the
23 crud trap by either making the tube flush with the face of
24 the tube sheet and fusion welding or reducing the tube
25 slightly and again fusion welding at again roughly a

1 45-degree angle.

2 Q The next physical feature that is discussed in your
3 testimony is the primary channel head external drain.

4 Can you, by referring to one of the two figures,
5 show us where that is located in the steam generator?

6 A It's most easily demonstrated on Figure 2.

7 In order to gain egress to the channel head of the
8 steam generator, large penetrations are put in the water
9 bed in order that a man may gain access.

10 The geometry of the channel head is such that were
11 only the penetration -- the penetration was made, there
12 would be residual accumulation of primary water in the
13 channel head when the unit had been attempted to be
14 drained.

15 The initial attempt at reducing radiation exposure
16 was to drill an almost horizontal hole through the knuckle
17 of the manway pad, which would then drain all of the water
18 which was above that point.

19 There was an enhancement of this design by
20 eliminating this penetration altogether and going to a
21 central drain hole at the base of the channel head, which
22 then substantively removes all of the primary water from
23 the channel head during drainage.

24 Q All right, sir.

25 The next physical feature that is discussed in your

1 prepared testimony is the primary nozzle closure rings.

2 Could you indicate where they are located on the
3 diagram?

4 A These are the primary nozzles. The primary water enters
5 one of them and exits another one on the opposite side of
6 the channel head.

7 (Indicating.)

8 The primary pipes have a large surface area clad
9 with stainless steel. The shine -- the energy shine --
10 from the particles precipitated on the primary pipes are
11 shunt into the channel head, making more exposure than is
12 desirable.

13 In order to preclude this, we welded rings, I rings
14 and L rings, to the boundary of the primary nozzle -- both
15 primary nozzles and then made collapsible covers, which,
16 upon service, could be inserted through a manway, cover
17 the primary pipes and therefore allow the operators to
18 perform their tooling operations within the channel head
19 with only a minimum of radiation exposure.

20 JUDGE SMITH: Mr. Miller, for those who are
21 simply reading the transcript, I think it would be helpful
22 to explain that he is referring to the area below the tube
23 sheet area, and the primary nozzle is in the area of the
24 coolant inlet and the manway referred to is the lower of
25 the two manways.

1 MR. MILLER: Thank you very much, Judge Smith.

2 BY MR. MILLER:

3 Q Now, then, the next feature that you referred to is the
4 design of the manway access opening.

5 Would you just point out for the Board and the
6 parties where the manways are located on Figure 2?

7 A There are two sets of two each manways on the steam
8 generator, two in the lower portion in the channel head,
9 two in the upper steam drum above the level of the tubes.

10 Q Are those the -- are two of those manways shown on Figure
11 2 and identified as such?

12 A Yes, they are.

13 Q Now, then, perhaps you could next indicate for us where
14 the ladders and deck plates and access openings are --
15 would be in a Model D 4 steam generator?

16 A The ladder is shown schematically where I am pointing.

17 (Indicating.)

18 The accesses are placed in these horizontal plates
19 at three locations.

20 (Indicating.)

21 Q And the ladder, then, is indicated schematically by the
22 lines that are at a slight angle up near the manway, the
23 upper portion of the diagram; is that correct?

24 A That's a correct description.

25 Q Can you point out for us on the diagram where the

1 instrument and access openings of the Model D 4 steam
2 generators are?

3 A They are not indicated on the diagram, so I will indicate
4 with the pointer where they are.

5 There are several in a plane just above the level of
6 the upper face of the tube sheet. There are instrument
7 ports at several locations on the vertical surface of the
8 steam generator shell; and then in the D 5 steam
9 generators there are penetrations approximately at the
10 elevation of the top tube support plate.

11 MR. MILLER: All right, sir.

12 That concludes my supplementary direct examination.

13 Dr. Conway is available for cross examination at
14 this time.

15 MR. RAWSON: Excuse me, if I may, Judge.

16 For the purposes of the record, I thought I heard
17 Dr. Conway say D 5 in the last description.

18 Was that intended?

19 THE WITNESS: Yes, it was.

20 MR. RAWSON: Thank you.

21 THE WITNESS: Shall I remain beside the diagram?

22 MR. THOMAS: I don't think that's going to be
23 necessary, at least not at the beginning, at the beginning
24 of the cross examination, which I will now submit to the
25 Board the cross examination plan for Dr. Conway.

CROSS-EXAMINATION ON BEHALF OF
ROCKFORD LEAGUE OF WOMEN VOTERS

BY MR. THOMAS

1
2
3
4 Q Dr. Conway, your prefiled testimony indicates that you are
5 employed as an advisory engineer in the steam turbine
6 generator division; is that correct?

7 A That's correct.

8 Q Now, in that capacity do you know what procedure, if any,
9 Westinghouse has or uses to incorporate ALARA criteria
10 into the design of steam generators?

11 A In that capacity literally, no, because I have changed
12 divisions.

13 In my previous capacity, yes.

14 Q Okay. What was your previous capacity?

15 A In the several previous capacities I would know the answer
16 to the question you have asked, and that was as an
17 engineer, low level manager and then a somewhat higher
18 level manager.

19 Q Okay. What, then, are the formal procedures used by
20 Westinghouse to incorporate ALARA criteria into the
21 design?

22 A All engineers are trained with the divisional training
23 scheme, which incorporates the ALARA requirements into the
24 directions for their work, so that they are inculcated
25 immediately in the requirements for ALARA.

1 In addition, in every design review it is corporate
2 standard that ALARA question be addressed, and for that we
3 select specialists in ALARA from Pittsburgh to participate
4 in our formal design reviews.

5 Q In that respect, do health physicists contribute to the
6 design of steam generators?

7 A Yes, they do.

8 Q In the capacity that you just outlined when you said
9 specialists?

10 A Correct.

11 Q To your knowledge, are any of those health physicists
12 certified as health physicists by the American Board of
13 Health Physics?

14 A I am afraid I don't know the answer to that question.

15 Q To your knowledge, does Westinghouse employ any health
16 physicists certified by the American Board of Health
17 Physics?

18 A I don't know the answer to that question.

19 Q If you can detail a little more exactly the way the health
20 physicists contribute to the steam generator design?

21 Do they submit written proposals or do they verbally
22 critique designs that are laid before them?

23 A Predominantly, they participate with the engineers in
24 laying out concept and then they will critique the designs
25 and then on some occasions will submit written reports

1 upon the subject.

2 Q Can you give us the names of any health physicists who
3 presently have input in the steam generator design at
4 Westinghouse?

5 A No, I don't have their names with me right now.

6 Q Is there any procedure for, I guess, what would be the
7 vendor here or Applicant here, Commonwealth Edison, to
8 have input into ALARA criteria in the design of steam
9 generators?

10 A Oh, yes, there are continual negotiations with the utility
11 on subjects just like that.

12 Q And do those negotiations take place with health
13 physicists at Commonwealth Edison, or who at Common -- who
14 at Commonwealth Edison takes place -- takes part in those
15 negotiations, as you call them?

16 A Personnel from Commonwealth Edison, with which I have
17 discussed the design of steam generators, have certainly
18 been well informed on the subject of health physics and
19 ALARA and the balance of steam generator design.

20 That they were or not health physicists, I don't
21 know.

22 Q In your prefiled testimony, as far as the ALARA criteria
23 are concerned, it does not distinguish between D 4 -- the
24 D 4 and the D 5.

25 It's correct that Byron has one D 4 and one D 5; is

1 that right?

2 A 4 D's. I was correcting one unit.

3 Q One unit has D 4's and one unit has D 5's?

4 THE WITNESS: Is that sufficient for the
5 reporter?

6 THE NOTARY: Yes, sir.

7 BY MR. THOMAS:

8 Q What ALARA criteria or features, if any, are incorporated
9 into the design of the D 5's, which are not present in the
10 D 4's?

11 A It appeared that maintenance access ease was a probable
12 enhancement in reducing worker radiation exposure.

13 Therefore, the D 5's had more, and more convenient,
14 access openings than the Model D 4.

15 Q For example, I think you indicated in your supplemental
16 testimony just now that the D 5's have manways near the
17 top of the tube sheet bundle, is that correct, for
18 observation?

19 A That's correct; but also do the D 4's.

20 Q The D 4's do, too?

21 A Yes.

22 Q In what way does -- the ease of maintenance access, in
23 what way is that reflected in the D 5's that is not
24 reflected in the D 4's?

25 A There is ease of access reflected in the D 4's and also

1 the D 5's. It is hoped that the extra access which is
2 given to the D 5's, which will certainly ease intrusion
3 into the interior of the steam generator, will, because of
4 the rapidity with which maintenance can be performed,
5 reduce the radiation exposure of the employees servicing
6 the device.

7 Q What is that ease of access?

8 A It's removing covers from the side of the steam generator
9 segregation shell in order that one may see into the
10 interior of the tube bundle

11 Q And those removable covers are present in the D 5 but not
12 the D 4?

13 A They are present in both.

14 The D 5 has more of them.

15 Q What are the dimensions of those covers?

16 A The covers will be of the order of eight inches diameter
17 and five inches diameter.

18 Q Are you talking about the inspection ports?

19 A Yes, I am.

20 Q And then is it your testimony that that's the only design
21 difference, as far as ALARA criteria are concerned, that
22 is in the D 5 which is not in the D 4?

23 A No, there are further. The D 5, being a later generation
24 of steam generator, has materials contained it that we
25 believe will be less amenable to corrosion, require less

1 service and therefore require less exposure.

2 Q What are those materials?

3 A Stainless steel.

4 Q As opposed to the carbon support plates?

5 A Correct.

6 The tube, also.

7 Q The what, the tube?

8 A The steam generator tubing also is being modified in a
9 fashion which we hope will reduce the requirements for
10 service.

11 Q What fashion is that?

12 A It was thermally treated as the last operation at the tube
13 plant.

14 Q Are there any other differences in design, as far as ALARA
15 is concerned, between the 5's and the 4's?

16 A None of any substance I could think of.

17 Q Are the inspection ports in the D 5's located directly
18 across from the top of the tube bundle?

19 A No. They are located -- one, at least, is located
20 directly across from the top tube support plate of the
21 tube bundle.

22 Q Okay. Where are the others located?

23 A There are. I believe, six or eight close to the plane of
24 the tube sheet and the balance are scattered on vertical
25 center lines of the shell.

1 Q How many are there in total?

2 A I believe there are -- I believe there are 11 in the D 5.

3 Q Is it correct that only one of the inspection ports
4 affords a view of the top of the tube bundle?

5 A No, that's not correct.

6 Q How many of them would afford such a view?

7 A Both of the manways in the upper steam drum afford the
8 ability to view the top of the tube bundle.

9 Q What involvement, if any, did you have in the process of
10 incorporating ALARA criteria or features in the Byron
11 steam generators specifically?

12 A A continuous association.

13 Q Could you amplify on that a little bit?

14 A I am familiar with the strictures of ALARA, even though I
15 believe at the time of the initial design they were not
16 announced as such; and myself and my colleagues, in our
17 discussion on the functional and safety behavior of the
18 steam generator, would continually incorporate ALARA
19 requirements and desirable features into the design
20 continuously.

21 Q And this is the Byron specific steam generators that you
22 are speaking of?

23 A This and every other steam generator.

24 Q Can you tell me what recommendations and specifications
25 the Applicant here transmitted to Westinghouse concerning

1 ALARA criteria in the design of the Byron steam
2 generators?

3 A I am sorry. I don't recollect the -- what it was
4 precisely that they transmitted.

5 Q In your testimony -- and I think it's Page 5, Q and A 5,
6 you state that the Byron steam generators minimize
7 personnel radiation exposure by reducing the time spent by
8 workers in the radiation field.

9 A That's correct.

10 Q Okay. What familiarity, if any, do you have with the time
11 intervals required to perform individual occupational
12 tasks related to steam generator maintenance?

13 A I have a good general understanding of the times required
14 to perform the maintenance, because most of the
15 maintenance requirements were written by the division and
16 myself for execution by the nuclear service division and
17 the utility.

18 MR. THOMAS: Excuse me a moment.

19 BY MR. THOMAS:

20 Q Were you -- are you familiar with the maintenance
21 operation at Zion where they built mock-up steam
22 generators with regard to repair work at Zion?

23 A I am slightly familiar with it.

24 Q Do you consider yourself to be an expert in the field of
25 time intervals required to perform individual occupational

1 tasks relating to steam generator maintenance?

2 A I consider myself to be an expert in that task sufficient
3 for the design of a steam generator.

4 Q I am not sure what -- I am not sure what your answer to my
5 question means.

6 Can you answer that, the question I asked you, yes
7 or no?

8 MR. MILLER: Judge Smith, I have refrained from
9 objecting, waiting to see where this line of examination
10 was going.

11 Dr. Conway submitted testimony that was fairly
12 limited.

13 JUDGE SMITH: I can see where it's going; but it
14 got there faster than counsel wanted it to go. He gave
15 you a very good answer to your question.

16 MR. MILLER: I thought so, too.

17 MR. THOMAS: Well, it's hard to know exactly
18 what the answer means.

19 The problem I have, your Honor, is that he has steam
20 generator testimony, which -- he is a witness in the area
21 of steam generator tube integrity, he is a witness in the
22 area of ALARA, and I am trying to understand somewhat the
23 relationship between the two.

24 I understand that the witness feels that one is a
25 continuum into the other; but I am trying to establish the

1 areas in which he considers himself to be an expert and
2 the areas he doesn't.

3 I am not sure that his answer to my question
4 established that. That was the point of the question.

5 MR. MILLER: Well, it seems to me that counsel
6 has asked a number of foundational questions with respect
7 to Dr. Conway's familiarity with maintenance operations,
8 his knowledge of what went on at Zion and then he asked
9 the ultimate question with respect to his expertise on the
10 specific issue of maintenance time intervals; and I
11 thought there was a responsive answer -- a completely
12 responsive answer given.

13 I find the question objectionable.

14 JUDGE SMITH: Have you had some special
15 training, Dr. Conway, in time study engineering or
16 whatever the discipline is?

17 THE WITNESS: Yes, I have, your Honor.

18 BY MR. THOMAS:

19 Q Can you tell us what that training is?

20 A Yes. It was the training contained within the division
21 within which I work, the time it takes to execute various
22 tasks in the factory and, by association, some of those
23 tasks in the field.

24 In addition, I am -- or I was, at the time I worked
25 at the division, in intimate communion with the personnel

1 who did the tasks, and in fact -- and in fact interacted
2 day by day, hour by hour, and sometimes minute by minute.

3 Q When did you leave that division?

4 A September.

5 Q Of '82?

6 A Correct.

7 Q And specifically what training did you receive and when
8 did you receive it?

9 A The formal training I received in the division around the
10 years of '72 through about '75 in varying degrees and
11 varying amounts.

12 The balance of on-the-job training was continuous.
13 It is a daily activity, in the design of steam generators,
14 that you would cooperate in the very design itself.

15 Q Do you know the maintenance which would be required to
16 detect a leaking tube inside the steam generator?

17 MR. MILLER: I am going to object to the form of
18 the question.

19 I am not sure it's been established that maintenance
20 is required to detect a leaky tube in a steam generator.

21 JUDGE SMITH: Well, is it, Dr. Conway?

22 A There are two forms of maintenance, your Honor. The first
23 is detection of low level radioactivity in the secondary
24 water, which is indicative of a tube leak. Then
25 subsequent to that, if it's necessary to drain the steam

1 generator, then you have to find the leak in particular.

2 Usually it is done by draining the primary side,
3 leaving coolant in the secondary side, and looking for the
4 drips literally from the tube which leaks.

5 JUDGE SMITH: With that explanation, would you
6 restate your question?

7 MR. THOMAS: Yes. I will put a follow-up
8 question.

9 BY MR. THOMAS:

10 Q With regard to the second scenario that you outlined, what
11 would be the time interval required to perform that task?

12 A It depends upon the magnitude of the leak.

13 On occasions it is merely the removal of the manway
14 cover and the leak is immediately available. On other --
15 and, therefore, the time is seconds.

16 Others require further study, particularly if there
17 are several leaks, and then it may take on the order of an
18 hour.

19 Q All right. Given the estimate -- and I understand it's an
20 estimate -- of an hour, what occupational exposure would
21 result during that period of time?

22 A I am not an expert on that subject, but it will suffice to
23 say that it depends entirely upon the contamination of the
24 channel head.

25 Q Are you -- and you may have just answered this; but are

1 you an expert with regard to radiation exposure dosages
2 incurred in the performance of individual occupational
3 tasks?

4 A Would you repeat the question, please?

5 Q Certainly.

6 Are you an expert with regard to radiation exposure
7 dosages incurred in the performance of individual
8 occupational tasks?

9 A I hesitate to describe myself as an expert. However,
10 Westinghouse has a standard document, culled from the
11 statistics of standard maintenance tasks on steam
12 generators, with which I am very familiar.

13 Q Did you prepare that document or participate in the
14 preparation of the document?

15 A I participated in the preparation of it.

16 BOARD EXAMINATION

17 BY JUDGE SMITH:

18 Q Dr. Conway, you have been using a term here which I don't
19 understand.

20 Did you say channel head?

21 A Yes, I did, your Honor.

22 Q Where on Figure 2, attached to your testimony, is the
23 channel head?

24 A Shall I describe it verbally or switch the slide projector
25 on?

1 Q Is it the area below the tube sheet?

2 A Yes, all the area below the tube sheet.

3 Q But nothing above it?

4 A That's correct.

5 Q Could there be repairs in the tube head?

6 A Yes, because it's separated by a divider plate. In
7 addition, if it were not separated by a divider plate,
8 there could be two repairs in one-quarter of the
9 hemisphere. That is the quarter sphere.

10 BY MR. THOMAS:

11 Q Would you specify, please, which aspects of the steam
12 generator design at Byron minimize the personnel radiation
13 exposure by providing distance between the radiation
14 source and the workers?

15 A Yes. The framing of the manway is arranged such that
16 remote maintenance equipment can be attached to it and,
17 therefore, the maintenance in the interior of the channel
18 head can be done by men which are well removed from actual
19 contact with the tube sheet face.

20 Q Is that it? Is that the only --

21 A That is the predominant one and overwhelms all of the
22 others on the primary side.

23 On the secondary side --

24 Q Is all maintenance?

25 MR. MILLER: Wait a minute, wait a minute. I

1 don't think he has finished his answer.

2 MR. THOMAS: I am sorry. I thought you had.

3 Go ahead.

4 A (Continuing.) On the secondary side, the very convenient
5 access openings we prepared allow the men very expeditious
6 means for repairing or flushing of the interior of the
7 steam generator.

8 MR. THOMAS: Did that complete your answer?

9 THE WITNESS: Yes, it did.

10 BY MR. THOMAS:

11 Q Is all the maintenance in the primary channel head done by
12 remote control?

13 A No, not all of it is.

14 Q So it's still going to be necessary for people to go in
15 there; is that correct?

16 A That's why the size of the manways were so chosen to
17 maximize egress and minimize shine.

18 Q Did you say that the diameter of that was 16 inches?

19 A Correct.

20 Q Isn't that still awkward for a man to fit through there?

21 A It really does depend upon the man.

22 I have no trouble. I have no hindrance at all; but
23 common observation, a very large -- larger man, suited,
24 surely there is hindrance in getting in.

25 Q Are you an expert in the field of steam generator

1 inspection criteria, operations and equipment?

2 A No, I am not an expert. Generally conversant, yes.

3 Q Now, with regard to the flush or slightly recessed welds
4 that you spoke about in your supplement to your prefiled
5 testimony here, is the primary purpose of that design
6 feature to eliminate an area where radioactive deposits
7 could accumulate and create corrosion in the steam
8 generator?

9 A There are several functions involved in the change, and
10 that was one of the prime ones.

11 Q What are the crevice areas on the primary and secondary
12 side of the Byron steam generators which will still result
13 in accumulated radioactive deposits?

14 A I cannot recollect any crevices on the primary side. On
15 the secondary side the most common crevice, when that
16 subject is addressed, is at the upper face of the tube
17 sheet. The tubes were pulled up to prevent contamination
18 of the crevice.

19 Q Are you saying you do not expect any radioactive deposits
20 to build up on the primary side?

21 A I said that there were no crevices.

22 Q Okay, all right.

23 What are the areas on the primary and secondary side
24 which will still result in accumulated radioactive
25 deposits?

1 A On the primary side I can think of no specific areas now
2 which tend to focus deposits.

3 On the secondary side, the very tube pattern itself
4 will encourage some precipitation, but save for that I can
5 think of no others.

6 Q Well, at the top of the support plates be a likely source
7 of deposits?

8 A They have not in the past, and the change with the --
9 particularly the Byron steam generator would make it even
10 less likely.

11 Q Well, are you -- you aren't saying that there hasn't been
12 any corrosion on the -- at the first support plate on the
13 top of the tube bundle in the past, are you?

14 A Well, there is a contradiction in your description.

15 The first tube support plate is not near the top of
16 the tube bundle.

17 Q I mean the first one down from the top of the tube bundle.

18 A There has been corrosion in some sites of that tube
19 support plate. I am not aware of any particular
20 contamination resulting.

21 Q Is it true that that site may be conducive to denting?

22 MR. MILLER: I will object. I think we are
23 getting way beyond the scope of the witness' direct
24 testimony, ALARA considerations and design.

25 JUDGE SMITH: Would denting require additional

1 repair time, additional repair time?

2 THE WITNESS: Yes, it would, your Honor.

3 JUDGE SMITH: Then the objection is overruled.

4 MR. MILLER: Do you have the question in mind,
5 Dr. Conway?

6 THE WITNESS: No, I do not. Would you repeat
7 it, please?

8 MR. THOMAS: Would you read back the question,
9 please.

10 (The question was thereupon read by the
11 Reporter.)

12 A It is flatly and unequivocally not true that that site
13 will be conducive to denting.

14 BY MR. THOMAS:

15 Q Would your answer be the same if I said may be conducive
16 to denting as opposed to will be in the D 4 models?

17 A All sites may be conducive to denting.

18 I think with the protective features which are now
19 in service and will be immediately in service with the
20 Byron steam generators, it is a maybe, but a small
21 fractional maybe.

22 Q That is an area where denting has taken place in the past;
23 is that right?

24 A That is correct.

25 JUDGE SMITH: Now, we might want to revisit the

1 objection, having established his answer to begin with.

2 The objection was overruled under the assumption
3 that there would be denting and it would require more
4 occupational exposure. Now you are going to have later on
5 a litigation on steam tube integrity.

6 MR. THOMAS: I am going onto another --

7 MR. MILLER: I assumed that the examination was
8 coming to an end on this subject matter and that's why I
9 refrained.

10 MR. THOMAS: That's true, that's true.

11 BY MR. THOMAS:

12 Q You have indicated that some of the crud traps, as you
13 call them, in your testimony, have been eliminated in the
14 channel -- in the primary channel -- head.

15 Are there any crud traps which remain?

16 A Yes, there are.

17 Q Where are they?

18 A Any machining, any surface, has minute excrescencies,
19 which make it potentially a crud trap.

20 Q Is that throughout the system?

21 A That is throughout every material of which I am aware.

22 Q Can you identify any potential crud traps or areas of crud
23 traps in the Byron D 4's or D 5's which remain?

24 A Yes.

25 Q What are those?

1 A They are the areas around the primary nozzle closure rings
2 and the manway recesses.

3 The degree to which we have observed crud trapping
4 is very small, and they could be eliminated, but the net
5 price of elimination is worse than having them as they
6 exist.

7 Q Is it greater on the primary side than the secondary side?

8 A I am afraid I don't follow the context of the question.

9 Q Well, let me, for the time being, go onto the area of
10 materials selection and control, which is another area you
11 identified in your testimony.

12 You indicate that the amount of cobalt-59 is limited
13 by the use of stainless steel and Inconel 600; is that
14 correct.

15 A No. It's limited by our selection of particular species
16 of Inconel 600 and stainless steel.

17 Q Now, isn't it true that a considerable amount of the CO-58
18 and CO-60 arrives from the CO-59 at the fittings, gaskets,
19 welds and so forth?

20 A No, no, I don't think so.

21 Q There is an Inconel 800 as well as 600; is that correct?

22 A Correct.

23 Q Isn't the 800 more resistant than the 600?

24 A No, not in our experience to date. It is flatly no.

25 MR. MILLER: I didn't get a chance to object to

1 the question; but I would like to know, I guess, more
2 resistant to what?

3 I think the record is --

4 MR. THOMAS: Resistive to radioactive deposits,
5 what we are talking about, the subject of the examination.

6 THE WITNESS: No, that is not the response I
7 made, and perhaps I should have waited for the objection.

8 BY MR. THOMAS:

9 Q Well, is it more --

10 A I responded it was more resistant to corrosion. I
11 responded in terms of whether it was more or less
12 resistant to corrosion.

13 Q Is it more resistant to radioactive deposits?

14 A No, I don't think so.

15 Q All right. The same answer then.

16 Excuse me a moment, your Honor.

17 In your testimony you refer to the use of austenitic
18 is that pronounced correctly?

19 A Correct.

20 Q -- stainless steel.

21 Is there any other austenitic stainless steel used
22 in the Byron steam generators other than that which you
23 have identified in your prefiled testimony?

24 A None that I can think of.

25 Q To clarify the prefiled testimony, where is that stainless

1 steel used in the Byron -- utilized in the Byron steam
2 generators?

3 A It's used in the cladding of the primary chamber. It's
4 used in the attachments to the cast steel primary nozzles.
5 It's used in the clad on the manway covers, primary manway
6 covers.

7 That is all of the locations that I can recollect.

8 Q Are there other locations where it could be used?

9 A It could be used at all locations; none more profitably, I
10 feel.

11 Q And why is that?

12 A Because the materials which are currently there are
13 superior for service and will require less maintenance.

14 Q But will they be as resistant to radioactive deposits as
15 the austenitic stainless steel?

16 A Yes, I think so.

17 Q On the secondary side, is that austenitic stainless steel
18 used at the support plate locations on the D 5?

19 A No.

20 Q What type of steel is used there?

21 A Paretic 405 stainless steel.

22 Q Is that as resistant as austenitic?

23 A We feel it is more resistant to the potentially corrosive
24 environment on the secondary side than austenitic
25 stainless.

1 Q What about deposits?

2 A The deposits on the plates have never, that I am aware of,
3 been a particularly burdensome source and, therefore, I
4 feel it's irrelevant between the two of them.

5 Q Is it more expensive to use austenitic stainless steel?

6 A Than what?

7 Q Than Inconel 600.

8 MR. MILLER: Can we have an identification of
9 which component of the steam generator he is referring to?

10 This examination is kind of formless at this point.

11 JUDGE SMITH: Will you accommodate him?

12 MR. THOMAS: All right. The -- I am not sure it
13 makes a difference, but the interior of the chamber wall.

14 THE WITNESS: I am sorry. That doesn't make --

15 MR. THOMAS: The interior of the channel head
16 wall.

17 THE WITNESS: Would you start the question
18 again, please, because I have completely lost the context?

19 BY MR. THOMAS:

20 Q All right. Is it more -- is austenitic stainless steel
21 more expensive than Inconel 600?

22 A In what product form?

23 Q In the form of the channel head wall.

24 A I am sorry. I have never known a channel head wall of
25 either material and, so, therefore, I can't place the

1 relevance of the question. It's not that I am trying to
2 be obstructionist. It's just that it's a non sequitur.

3 Q I understand, I understand.

4 Didn't you say that the austenitic was used in two
5 areas?

6 A Yes, I did.

7 Q What areas are those?

8 A They were to clad the primary channel head bowl and they
9 were also to attach to the ends of the primarily nozzle
10 stubs.

11 Q Can you use Inconel 600 in those areas, also?

12 A Conveniently in the primary piping stubs and probably
13 interchangably on the channel head.

14 Q All right. On the channel head, would it be more
15 expensive to use the austenitic than the Inconel 600?

16 A No. It would be a wash.

17 Q Now, with regard to the support plates, isn't it correct
18 that Unit 1 will use carbon support plates, which will be
19 more susceptible of corrosion on the secondary side than
20 stainless steel?

21 A No, I don't agree with that premise at all. I think
22 neither are susceptible with satisfy operation.

23 Q But I take it from your answer -- correct me if I am wrong
24 that Unit 1 will use carbon support plates and Unit 2 will
25 use stainless steel; is that right?

1 A That's correct.

2 Q And you are saying that they are equally susceptible to
3 corrosion?

4 A I did not say that. I said I felt that neither were
5 susceptible to corrosion with satisfactory operation of
6 the steam generator.

7 Q And do you also believe that neither are susceptible to
8 radioactive deposits?

9 A I think that neither are more nor less susceptible to the
10 degree that we have observed it as a problem, which is, to
11 the best of my knowledge, no problem at all.

12 Q If the tubes in the tube bundle at Byron were of a larger
13 diameter, wouldn't this lessen the buildup of radioactive
14 deposits in the steam generator?

15 MR. MILLER: I am going to object. I think Dr.
16 Conway has now testified twice that radioactive deposits
17 are simply not a problem in terms of occupational
18 exposure. Therefore, this is a totally irrelevant line of
19 inquiry.

20 MR. THOMAS: Well, Judge, first of all, I don't
21 think he has testified to it.

22 Secondly, if we simply have to take and accept as a
23 premise the fact that there are no problems with
24 radioactivity or radioactive deposits in the steam
25 generator, I don't see what we are doing here.

1 JUDGE SMITH: Well, with -- my memory of his
2 testimony is that the -- he referred to particular
3 locations in the steam generator it was no problem.

4 Now the question is if the tubes were of a larger
5 diameter, would it lessen the buildup of radioactive
6 deposits, apparently any place in the steam generator in
7 its entirety.

8 Does the question make technical sense?

9 THE WITNESS: Yes and no, your Honor.

10 Yes, it would lessen the deposits because it would
11 lessen the power output of the steam generator, but were
12 you to select the steam generator of the steam power with
13 larger diameter tubes and you would have a larger area
14 and, therefore, you would probably increase the
15 precipitation that you got there.

16 BY MR. THOMAS:

17 Q With regard to your testimony at Page 10, Question and
18 Answer 11, you indicate that the minimum necessary number
19 of small instrument and access openings have been provided
20 for necessary inspection and so forth.

21 Why the minimum number?

22 A There is an optimization of openings with respect to
23 numbers. If you put many in, then you get much shine and
24 potential leakage from all of them and, therefore, they
25 require maintenance.

1 The converse is that many make rapid access and,
2 therefore, minimum shine.

3 We believed that we had got the minimum radiation
4 exposure with the selection of number of access
5 openings that we have right

6 Q Do you know what amount of radiation is expected from the
7 Byron D 4 and D 5?

8 A I think that's a not answerable question, because it
9 depends entirely on the operational state and will, in
10 fact, vary with time.

11 It may be from nothing to numbers I have no idea of.

12 Q Are the same number of instrument and access openings
13 provided for both -- in both the D 4 and the D 5?

14 MR. MILLER: I am going to object.

15 I know that one has been asked and answered.

16 JUDGE SMITH: If it has, the objection is
17 sustained.

18 MR. THOMAS: If it has, I am not aware -- has
19 it?

20 THE WITNESS: Yes, it has been answered.

21 MR. THOMAS: Okay.

22 BY MR. THOMAS:

23 Q Can you identify leakage sites expected from gaskets,
24 manways and other access openings?

25 MR. MILLER: Excuse me. May I have the question

1 read before you answer it?

2 (The question was thereupon read by the
3 Reporter.)

4 MR. THOMAS: Excuse me. I meant -- I think I
5 asked --

6 A They are gaskets, manways and access openings.

7 MR. THOMAS: I have no further questions at this
8 time, Judge, of this man.

9 Again, I have some problem in a sense that he has
10 elicited, also, as a witness for steam generator tube
11 integrity, which has impacts -- which also has ALARA
12 considerations involved.

13 I don't propose to go through each one of the issues
14 in that area at this time, as I understand the purpose for
15 which his testimony is proffered.

16 I would certainly reserve the right to go into those
17 matters when he is again offered as a witness regarding
18 steam generator tube integrity.

19 JUDGE SMITH: With the ALARA aspects of it
20 again?

21 MR. THOMAS: Pardon?

22 JUDGE SMITH: With the ALARA aspects of it?

23 MR. THOMAS: Well, as I understand it, any time
24 you are talking about corrosion and tube integrity, there
25 are some ALARA considerations.

1 I do not propose to go into the ALARA considerations
2 per se from those problems; but I just want to make it
3 clear, you know, that -- excuse me a minute.

4 I do have a few more questions, if I might, before I
5 quit.

6 BY MR. THOMAS:

7 Q Does Westinghouse -- has or does Westinghouse make a
8 generic recommendation to Byron for flushing out the crud
9 from its steam generators?

10 A Yes, they do.

11 Q And what method is recommended, or methods?

12 A On the secondary side, which is most important, it's
13 sludge lancing.

14 Q Is there one on the primary side?

15 A Yes, of a different format. It is the common swabbing or
16 a grading, depending on the magnitude of the tasks
17 envisaged that you will do this in any normal radioactive
18 environment.

19 Q Does Westinghouse recommend a specific chemical
20 composition of the flush out?

21 A I am sorry. I don't know the answer to that question.

22 Q What is the ratio of the cobalt-60 to the cobalt-58 in the
23 crud?

24 A I am not sure that we have cobalt-58 in the crud.

25 Q Do you mean that you don't know whether there is or not?

1 A I believe that --

2 Q Cobalt-58 that is present in the crud?

3 A No, that's not what I mean at all.

4 Q Okay. Would you --

5 A What I mean is I believe the common isotope is 59. It's
6 normally transformed to 60. There will presumably be
7 traces of all the other isotopes, 58 being another one,
8 and that magnitude I have no idea of at all.

9 Q Do you know what the principal source of the cobalt-58
10 will be?

11 A I just agreed that -- understand where the 58 is coming
12 from.

13 Q Well, all right. I understood you to agree to the ratio.

14 All right. How long does Westinghouse estimate
15 steam generators of the type installed at Byron can be
16 operated before they should be replaced?

17 MR. MILLER: I am going to object. That is
18 clearly beyond the scope of his direct testimony, and I
19 sympathize with Mr. Thomas' concern about overlap between
20 Dr. Conway's appearance here and the steam generator tube
21 testimony but that question for sure it seems to me ought
22 to be addressed in that evidentiary session rather than
23 this one.

24 MR. THOMAS: Judge, surely the operating -- the
25 objective operating life of the steam generators at Byron

1 is a matter relevant to concerns of ALARA, ALARA concerns.

2 I would also indicate that that is my last question,
3 if it makes any difference.

4 JUDGE SMITH: We seem to have a divided Board
5 here.

6 I believe it's arguably relevant. So in instances
7 like that we will go in the direction of a complete record
8 and allow the answer.

9 MR. THOMAS: Thank you.

10 A The steam generator is designed for 40 years of service.

11 BY MR. THOMAS:

12 Q Is that --

13 A I am not complete.

14 Q I am sorry, I am sorry.

15 A The benefits of the design enhancements and operational
16 ability are continually stretching the lives of steam
17 generators.

18 Therefore, I would hope that the Byron sites are
19 40-year steam generators.

20 Q Well, all right. I don't mean to be picky. That's your
21 estimate.

22 Is that an estimate which Westinghouse provides? I
23 mean is that an official estimate or just your hope?

24 A I have no idea what estimate Westinghouse provides to the
25 utilities, because of the differentiating operating

1 practices of the utilities.

2 JUDGE SMITH: What is your best engineering
3 judgment?

4 THE WITNESS: Your Honor, I don't see if we
5 follow the -- if we police the vessels as we have been,
6 that they will be pulled out of service, because the last
7 of the latter-day 44's and 51's are running quite sweetly.

8 MR. MILLER: Just for the record, would you
9 indicate what you meant when you referred to the 44's and
10 51's?

11 THE WITNESS: 44,000-square-foot steam
12 generators and 51,000-square-foot steam generators.

13 MR. MILLER: Were those models which precede the
14 D4's and D5's at Byron?

15 THE WITNESS: Most of them preceded the D4's and
16 D5's at Byron.

17 MR. THOMAS: I have no further questions.

18 JUDGE SMITH: Mr. Rawson.

19 MR. RAWSON: Judge Smith, I have one very brief
20 item.

21 BY MR. RAWSON:

22 Q Dr. Conway, I was confused by a response you gave to a
23 question that Dr. Smith asked earlier.

24 Would you be so kind as to turn on the overhead
25 projector, Figure 1, please.

1 A Yes, certainly.

2 Now, Dr. Conway, the channel head is the area below
3 the tube sheet; is that correct?

4 A That's correct.

5 Q Can you indicate for us and describe the lowest point on
6 Figure 1 at which a steam generator tube could require
7 repair?

8 A No, because all of the tube ends are in one plane, so the
9 lowest and highest at all points are contained in that
10 plane, this plane, the lower face of the tube sheet.

11 (Indicating.)

12 Q The steam generator tubes do not extend above the tube
13 sheet?

14 A Yes, they do, but that's the lowest point.

15 Q That is what I am asking, the level of the level of the
16 lower portion of the tube sheet is the lowest point at
17 which steam generator tube could require repair?

18 A That's correct.

19 MR. RAWSON: Thank you very much. That's all I
20 have.

21 THE WITNESS: Shall I remain?

22 BOARD EXAMINATION

23 JUDGE COLE:

24 Q Why don't you keep that on there?

25 You mentioned the term sludge lancing.

1 Could you explain that to me, sir? I don't know
2 what it means.

3 A Yes. In all of the waters introduced by the utilities, in
4 any waters known to man, eventually the water itself picks
5 up precipitates and some of them are soluble soils which
6 on boiling gradually get precipitated out and others are
7 solids. They tend to precipitate out at the lowest
8 boiling points. like the household kettle. The lowest
9 boiling point is the face of the tube sheet. The sludges
10 are a mass of obnoxious chemicals. To remove them
11 mechanically, one removes a penetration cover from each
12 end and sometimes in the middle of the shell adjacent to
13 the divider plate and takes a very high-powered water
14 lance and blasts and sucks simultaneously and then
15 physically abstracts the sludge in that fashion.

16 Q A water lance?

17 A Correct.

18 Q So you hose it out?

19 A Well, the lance is so fast, it's more than a hose. It's a
20 lance designed, double headed, various divergences of the
21 nozzles. It's quite a scientific endeavor.

22 Q All right, sir. Fine.

23 How is a steam generator tube plugged while you have
24 that Figure 1 on the Board?

25 A There are several historical ways in which they were

1 plugged, from driven tapered pins welded to covers welded
2 across to thimble plugs.

3 Q Sir, my interest in it, I don't need that kind of detail.
4 I am interested in the occupational exposure aspects of
5 it. A man might have to get into a certain space and
6 perform some mechanical actions and where would he have to
7 go and roughly what would he have to do and can you relate
8 that to that diagram, if he has to plug a leaking stem
9 generator tube?

10 A Were he to use Westinghouse mechanically patented plugs,
11 the whole of the endeavor could be done from the exterior
12 of the steam generator and his exposure would be almost
13 non-existent. It would be also extremely rapid.

14 Q That is what you would recommend?

15 A Correct.

16 Q Are there other ways to do it?

17 A Yes, there are. Any of the commonal mechanical means
18 whereby you would plug a tube, plugging, welding, covers,
19 things like that.

20 Q Would he plug both ends of the tube or only one end of the
21 tube?

22 A No, you would plug both ends.

23 Q Thank you, sir.

24 On Page 8 of your testimony, sir, you refer to -- in
25 Question 9 you refer to the primary nozzle has a closure

1 ring seal and these rings provide a seat for nozzle
2 maintenance covers?

3 A Correct.

4 Q Could you tell me what a nozzle maintenance cover is and
5 how that would minimize exposure to workers?

6 A Yes, sir. The cover of the nozzle serves several
7 functions. one of which is it allows operation inside the
8 channel head with the primary side flooded apart from the
9 channel head proper.

10 It also is there to prevent radiation shine from the
11 primary pipes.

12 So what we need is a mechanically strong cover, that
13 is sufficiently small to be inserted through a manway
14 which is not shown in this channel head, which is a
15 16-inch diameter manway, and, therefore, we have somewhat
16 elaborate, three-piece box girder structure, which when
17 assembled inside a channel head then forms a hermetic
18 seal. with that gas at the time forms a hermetic seal and
19 stoplights water leakage and shine coming back up the
20 primary pipes.

21 Q When is that used, sir?

22 A It's a question of degree. If, in fact, you are in the
23 channel head for a very modest time. it's not worth doing
24 because you can go in and out rather quickly. If it's a
25 long outage for some operation, then it would be placed in

1 at that time.

2 Q All right, sir.

3 What are the primary sources of occupational
4 exposure associated with repair and maintenance of a steam
5 generator, sir?

6 A Normally, it's bits of fuel in the primary water that
7 eventually get precipitated inside the channel head. Very
8 little of that which is precipitated on the tubes shines
9 down in the fashion which affects the worker. Most of it
10 is a precipitation on the channel head proper.

11 Q So the way you would drain the channel head during
12 maintenance would tend to flush that material out?

13 A Yes, it does.

14 Q All right, sir. Do you have -- of the items that you
15 listed, both design and other features, you have them
16 listed on Page 1 and also on Page 5 of your testimony,
17 sir.

18 Have you made any estimate of the fractional
19 reduction of occupational exposure that would result
20 because of these features?

21 A No, no, we don't have a quantitative measure like that.

22 Q So your estimate of the reduction is strictly on a
23 qualitative basis?

24 A Yes, it is.

25 Q You don't have any estimate?

1 A We have the means to make an estimate, in that we have
2 many of the statistics of common operations.

3 To string together the means, say, with a
4 hypothetical model, I don't recollect that we have done
5 that.

6 JUDGE COLE: All right, sir. Thank you. I have
7 no further questions.

8 JUDGE SMITH: Is there any additional cross
9 examination on Dr. Cole's questions?

10 MR. THOMAS: I have none.

11 MR. THOMAS: No, sir.

12 JUDGE SMITH: Okay.

13 MR. MILLER: I have no redirect, your Honor.

14 JUDGE SMITH: You are excused. That you very
15 much.

16 THE WITNESS: Thank you.

17 (Witness excused.)

18 MR. MILLER: Your Honor, our next witness is
19 going to be relatively -- I know it's 25 minutes to 5:00,
20 but his testimony is really quite brief and on a limited
21 subject. If the parties have no objection, I would hope
22 we could both begin and conclude his testimony today.

23 JUDGE SMITH: Is that likely, Mr. Thomas?

24 MR. THOMAS: You know how lawyers estimates are,
25 Judge.

1 JUDGE SMITH: Yes.

2 MR. THOMAS: I certainly don't mind beginning.
3 I don't know whether we are going to conclude.

4 JUDGE SMITH: He is on the sabotage.

5 MR. THOMAS: Right, he is a saboteur.

6 (Laughter.)

7 JUDGE SMITH: Mr. Miller, the people negotiating
8 the emergency planning issue had indicated also they might
9 like to make a report this evening. They were hot at it
10 all afternoon. Maybe they can make a report. I suppose
11 they would have come in for that purpose if that were the
12 case.

13 MR. MILLER: Well, Mr. Bielawski came in and
14 spoke to me briefly. I gather that there is some progress
15 being made. I am anxious to accommodate Mr. Roudo if we
16 can. He is going to have to come back tomorrow anyway,
17 then perhaps we ought to take a recess and see what the
18 situation is with respect to emergency planning.

19 JUDGE SMITH: Why don't we begin with his
20 testimony and then if, perhaps, somebody else can
21 volunteer to go consult with the negotiators, asking them
22 if they are going to have a report, then we can be
23 proceeding on two fronts.

24 MR. MILLER: Ms. Herrin will be examining Mr.
25 Roulo.

1 MS. HERRIN: Yes.

2 JUDGE SMITH: Mr. Roulo, would you stand and
3 allow me to administer the oath, please?

4 (Witness sworn.)

5 JEROME ROULO

6 called as a witness by counsel for Applicant, been first
7 been duly sworn by the Chairman, was examined and
8 testified as follows:

9 DIRECT EXAMINATION

10 BY MS. HERRIN

11 Q Would you please state your name for the record?

12 A Jerome Roulo.

13 Q By whom are you employed?

14 A Commonwealth Edison Company.

15 Q Do you have before you a document that is entitled,
16 "Testimony of Jerome L. Roulo on Contention 42?"

17 A Yes, I do.

18 Q By whom was this document prepared?

19 A By myself.

20 Q Do you have any corrections or changes in the testimony?

21 A No, I do not.

22 MS. HERRIN: Your Honor, I would like to move
23 that Mr. Roulo's prepared testimony be made a part of the
24 official testimony as if read and also his document
25 entitled, Roulo Exhibit 1, be made. I think it's

1 Applicant's Exhibit No. 7?

2 JUDGE SMITH: If we follow the procedure we have
3 been, that will just be incorporated as a part of his
4 testimony.

5 MS. HERRIN: Yes, that's right, I am sorry, your
6 Honor.

7 JUDGE SMITH: Without an Applicant's Exhibit
8 No.?

9 MS. HERRIN: Okay, all right. I am sorry.
10 That's fine.

11 Is that --

12 JUDGE SMITH: Yes. I think you have done all
13 you have to do now and we will seek objections.

14 Are there any objections?

15 MR. THOMAS: No objections.

16 MR. THOMAS: No objections.

17 JUDGE SMITH: The testimony and attachments will
18 be received as testimony in the transcript.

19 (The document referred to, the prepared
20 testimony of Jerome Roule, received in
21 evidence, follows:)

22

23

24

25

SUMMARY OF THE TESTIMONY OF
JEROME L. ROULO

Mr. Roulo is an employee of Commonwealth Edison Company whose present job title is Deputy Nuclear Security Administrator. As such his duties include administering the security screening program for employees of both Commonwealth Edison Company and its contractors at nuclear power plants. Mr. Roulo's testimony comprises that portion of Contention 42 dealing with the increased risk of sabotage as the result of using transient workers. The testimony describes the circumstances under which persons are allowed to work at the Byron Station without escort and describes the elaborate contractor employee screening procedure which must be followed for that purpose. Both the Nuclear Security Administrator and Quality Assurance check on the effectiveness of these screening procedures. Mr. Roulo's testimony concludes that there is no increased risk of sabotage at Byron Station as the result of using contractor employees, including transient workers.

TESTIMONY OF
JEROME L. ROULO
ON CONTENTION 42

Q.1. Please state your name.

A.1. Jerome L. Roulo

Q.2. By whom are you employed?

A.2. Commonwealth Edison Company

Q.3. How long have you been employed by Commonwealth Edison Company?

A.3. For 31 years.

Q.4. What is your present job title?

A.4. Deputy Nuclear Security Administrator.

Q.5. For how long have you held that position?

A.5. For five years.

Q.6. What are your duties as deputy Nuclear Security Administrator?

A.6. I administer the employee security screening programs for Commonwealth Edison Company and contractor employees.

Q.7. Please describe the scope of your testimony.

A.7. My testimony addresses that portion of League

Contention 42 which asserts that "obtaining the temporary services of transient workman ... results in ... increasing the risk of sabotage...."

Q.8. Are contractor employees allowed to work at Byron Station, after the reactor has loaded fuel, unescorted?

A.8. No, except under the circumstances described below: Commonwealth Edison Company mandates that all personnel, who require unescorted access to Byron Station, will undergo pre-employment screening. The screening requirement begins 90 days prior to fuel load. Individuals are accepted or rejected for unescorted access based on the results of the pre-employment screening.

Q.9. What are the requirements of the Byron Station contractor screening procedure?

A.9. Contractors working at Byron Station are required to submit a screening procedure to the CECO Nuclear Security Administrator for approval. The procedure must, as a minimum, contain provisions to:

1. Establish a method for evaluating employees who have maintained a trustworthy work record for three continuous years.
2. Conduct a background check on all employees who have been employed with the contractor for less than three years which includes:
 - a. Contacting prior employers.
 - b. Contacting personal references.

- c. Examination by a licensed psychiatrist or physician or other persons professionally trained to identify aberrant behavior, for purpose of observing and disqualifying persons displaying indications of emotional instability such that there is reasonable doubt the person could discharge his duties in a competent manner.
3. Establish a continued observation program for all employees, so that supervisors may identify and take appropriate corrective measures when personnel display aberrant behavior.
4. Provide for immediate notification, of the termination, of all personnel for whom unescorted access has been requested. Also, to cancel the unescorted access privilege for any individual whose trustworthy status has changed.
5. Commit to maintaining proper screening documentation and to making all documentation available to Commonwealth Edison Company and the Nuclear Regulatory Commission for audit. The documentation would include, as a minimum:
 - a. Current approved copy of the procedure.
 - b. Current letter of approval from CECO.
 - c. Current letter of authorized signatory officials.
 - d. Screening file for each concerned individual.
 - e. All current copies of requests for unescorted access.
 - f. All copies of cancellations of unescorted access.
 - g. Annual certificates of continuous observation.

Q.10. Does Commonwealth Edison Company check on the effectiveness of contractor screening programs?

A.10. Yes. Commonwealth Edison must assure that personnel, who have been granted unescorted access to Byron Station, have been screened properly. To this end, the Nuclear Security Administrator has a full time staff member, whose only assignment is to conduct periodic audits of all

contractors who require unescorted access to our nuclear plants. This individual can be supplemented with additional staff assistance if required.

Q.11. Are there any further checks of this contractor screening procedure?

A.11. Yes. Commonwealth Edison's quality assurance department personnel conduct periodic audits of contractor screening procedures and practices.

Q.12. Are there written guidelines for these screening requirements?

A.12. Yes. The attached screening requirements (Roulo Ex. 1) are furnished to all contractors who will require unescorted access to Byron Station. These requirements outline, in detail, the various rules by which we expect the contractors to satisfy the Commonwealth Edison personnel screening program.

Q.13. Have these procedures been reviewed by the NRC?

A.13. Yes. The Byron Station physical security plan has been evaluated by the Nuclear Regulatory Commission and has been accepted by them.

Q.14. Do you believe that there is increased likelihood of industrial sabotage at the Byron Station as a result of the employment of transient workers by contractors performing maintenance tasks at the Station?

A.14. No. I believe that the contractor screening procedure described above provides assurance that there is no increased risk due to the employment of transient workers. Only the employees meeting the stringent screening requirements set forth in Roulo Exhibit 1 can work unescorted at the Byron Station.

Roulo

Exhibit 1

Subject: Personnel Security Clearance - Screening Requirements for Access to Nuclear Power Plants

Contractors who have personnel needing unescorted access to Commonwealth Edison Company (CECO) Station Nuclear Power Plants are required to establish a personnel screening program. Appendix A quotes various regulatory requirements and CECO policies which are the basis for this requirement. Attachment 1 sets forth the requirements which the screening program must meet. Attachment 2 is a model procedure which may be used as a guide for establishing a contractor program.

Assistance in establishing a screening program can be obtained from Jerome L. Roulo, (312) 294-8554, and any questions should be directed to him.

Sincerely,

Winston L. Duke
Nuclear Security Administrator

WLD:JLR:jtf

Enclosure

APPENDIX A

BASIS FOR PERSONNEL SCREENING PROGRAMS

Unescorted access into an operating nuclear plant is authorized by the United States Nuclear Regulatory Commission Rules and Regulations, Part 73.55, Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Industrial Sabotage.

Following are excerpts from the various documents to be used in preparing the personnel security screening plan:

- a. ANSI N18.17-1973, "Industrial Security for Nuclear Power Plants", Paragraph 4.3 "Employee Screening." Procedures shall be employed for making a determination of the acceptability of candidates for nuclear plant employment and the continuing acceptability of employees with regard to their trustworthiness. These procedures shall include, as a minimum, the following provisions:
 - (1) an investigation, either prior to employment or prior to assignment to a position allowing access without escort, to disclose adverse character traits that might bear on his abilities or motivation to discharge his duties in a responsible manner.
 - (2) examination by a licensed psychiatrist or physician or other person professionally trained to identify aberrant behavior, either prior to employment or prior to assignment to a position allowing access without escort, for the purpose of observing and disqualifying persons displaying indications of emotional instability such that there is reasonable doubt that the person could discharge his duties in a competent manner.
 - (3) continued observation of all employees and appropriate corrective measures by responsible supervisors for indication of aberrant behavior of personnel in the course of performance of their duties.
- b. 10 CFR 73.55, Paragraph (a): The licensee shall establish and maintain an on-site physical protection system and security organization which will provide protection with high assurance against successful industrial sabotage by . . . the following:

Paragraph (a)(2): An internal threat of an insider, including an employee (in any position).

Paragraph (d): Access Requirements - (5) "A numbered picture badge identification system shall be used for all individuals who have authorized access to protected areas without escort. An individual not employed by the licensee but who requires frequent and extended access to protected and vital areas may have authorized access to such areas without escort provided that he receives a picture badge upon entrance into the protected area, which must be returned upon exit from the protected area, and which indicates: (i) non-employee - no escort required; (ii) areas to which access is authorized; and (iii) the period for which access has been authorized. Badges shall be displayed by all individuals while inside the protected area."

c. NRC MEMORANDUM FOR: Reactor Safeguards Licensing
Branch Members Division of
Operating Reactors

FROM: Robert A. Clark, Chief
Reactor Safeguards Licensing
Branch

SUBJECT: SCREENING OF INDIVIDUALS
GRANTED UNESCORTED ACCESS TO
THE PROTECTED AREA. Review
Guidelines #1

DATE: November 26, 1977

. . . unescorted access to the protected area may be granted to employees of a licensee and its contractors based on the reliability established by three (3) continuous years of trustworthy employment. This method of establishing reliability is considered to be equivalent to the pre-employment screening of ANSI N18.17-1973, Sections 4.1 and 4.2. A licensee's program for granting unescorted access to the protected area based on trustworthy employment is acceptable if (a) at least three continuous years of employment of the individual with the licensee or his contractor is documented, and (b) the trustworthiness of the individual as determined by a review of the individual's employment record.

ATTACHMENT 1

REQUIREMENTS FOR CONTRACTOR PERSONNEL SCREENING PROGRAMS
OPERATING NUCLEAR STATIONS

COMMONWEALTH EDISON COMPANY

I. OVERVIEW

All contractors with personnel performing work at Operating Nuclear Stations of the Commonwealth Edison Company (CECo.) must establish a personnel screening program. The following general steps are essential:

- . Establish a personnel screening procedure (Section II)
- . Obtain approval of the procedure from the CECo. Nuclear Security Administrator (NSA) (Section III A)
- . Implement the approved procedure: screen all personnel requiring unescorted access (Section III B)
- . Submit name(s) of official(s) authorized to approve requests for unescorted access to station (Section III C)
- . Submit Request for Unescorted Access to station (Section IV)
- . Maintain all documentation required by the approved procedure; this documentation must be available for audit by CECo. and the Nuclear Regulatory Commission (NRC) (Section V)
- . Submit changes in authorized access list to station as appropriate (Section VI A)
- . Submit revisions to the screening procedure for approval to the CECo. NSA (Section VI B)

II. SCREENING PROCEDURE

A. Introduction

1. The contractor shall submit a procedure detailing his personnel security screening program which meets the requirements of ANSI N18.17- 1973, "Industrial Security for Nuclear Power Plants," Paragraph 4.3 "Employee Screening."
2. The screening program consists of four elements used in several combinations depending upon the type of employee being screened:
 - a) Certification by Contractor/Union
 - b) Background Check
 - c) Behavioral Evaluation
 - d) Program for Continued Observation

Each element is described in detail in later sections and all are summarized in Section II G.

3. The procedure must address the screening of all types of personnel who may require unescorted access. In establishing his program, the Contractor must bear in mind that the purpose of his screening program is to determine and assure the continued acceptability of employees with regard to their trustworthiness

B. Certification by Contractor/Union

Employees or union members who have greater than three years of service may have all of their screening accomplished by supervisor certification. For contractor employees, the certification is made by a responsible contractor supervisor who can attest to the individual's trustworthiness. For union members, the same affirmation of trustworthiness shall come from the business agent or responsible officer of the member's local union. For people with three or more years of continuous employment or union membership, the certification is all the screening required.

There are cases where an employee has recently transferred from one nuclear station contractor to another. If such an individual has had continuous work experience in an operating nuclear station with satisfactory certification from previous employers, then he may be screened as if his employment had been

continuous with the current contractor. Thus, for example, if John Doe had worked for the XYZ company at Zion Station for the past three years and left XYZ to work for the ABC company at Zion Station, then ABC company may obtain a certification from XYZ company to include in John Doe's screening file. John would require no further screening.

C. Background Check

For employees and union members with less than three years of service, a background check is required as part of their screening. The background check shall, as a minimum, include the following:

- 1.) contact one (1) employment reference and contact two (2) other character references, or,
- 2.) contact two (2) employment references and contact one (1) other character reference.

The background check should address reliability and trustworthiness. The reference checks should not include relatives.

D. Behavioral Evaluation

Employees and union members with less than three years of service are required to undergo a Behavioral Evaluation similar to "Thurstone Temperament Schedule" by Dr. L. L. Thurstone, Science Research Associates, Inc., 259 East Erie Street, Chicago, Illinois, 60611; or 16 P. F. Test Form A, Institute of Personality and Ability Testing, 1602-04 Coronado Drive, Champaign, Illinois.

This evaluation is for the purpose of observing and disqualifying persons displaying indications of emotional instability such that there is reasonable doubt that the person could discharge his duties in a competent manner.

E. Continued Observation Program

The contractor shall include in his procedure provision for continued observation of all persons granted unescorted access to detect any signs of aberrant behavior or other indication of decreased trustworthiness. The contractor shall commit to notifying CECO. immediately of such signs and cancel the individual's unescorted access authorization.

F. Screening Requirements

The manner used to accomplish and document the screening of an employee will depend upon the length of time the individual has been associated with the contractor or union. There are two possible options listed below. The forms required for documentation of each option are attached as exhibits and referenced in the description. The contractor shall include the applicable option(s) with the associated forms as part of his screening procedure.

In order for an employee to gain unescorted access to a nuclear station for work purposes, individual contractors must certify each employee in accordance with one of the following options:

OPTION 1:

Observation by contractor supervision for three years or more while working for the contractor at any location (CECo. or non-CECo.) who will certify to the employee's reliability, (See Exhibit I), or;

Three years or more as a union member in good standing with certification by the business agent or responsible officer of the local union, (See Exhibit II), or;

Three years or more of continuous work experience in an operating nuclear station with satisfactory recommendations from all contractors with whom the person was employed during the three-year period.

OPTION 3:

A background check (See Paragraph II C).

A behavioral evaluation (See Paragraph II D).

G. Screening Requirements Summary

	<u>Requirements Summary</u>	
	<u>Less than three years (Option 3)</u>	<u>Three years or more (Option 1)</u>
Certification by Contractor	X	X
Program for Continued Observation	X	X
Background Check	X	
Behavioral Evaluation	X	

H. Subcontractor Screening

The Principal Contractor is responsible for the screening of all Subcontractor personnel. The screening will be completed utilizing the approved screening procedure submitted by the Principal Contractor.

III. PROCEDURE APPROVAL AND IMPLEMENTATIONA. Approval

The contractor shall submit his screening procedure to CECo. for approval. The procedure must be dated and signed by the responsible company official. The procedure should be submitted to:

Nuclear Security Administrator
Commonwealth Edison Company
P. O. Box 767 - Room 1248 E.
Chicago, Illinois 60690

The procedure will be reviewed promptly. If it is found to be acceptable, an approval letter will be sent to the contractor. This should be maintained as part of the screening program documentation.

B. Implementation

Prior to requesting unescorted access for any individual, the contractor must have all of his necessary screening accomplished and the documentation assembled. The contractor shall determine which of the three options is appropriate for each of the personnel needing access and make his own arrangements, such as for psychological evaluation services. In establishing the program it would be appropriate to advise each individual that his screening records will be available for audit by CECo. and NRC personnel upon request. Incomplete or inadequate screening will result in denying the concerned individual access to the site.

Personnel screening is a requirement establishing compliance with performance objectives in Federal Regulations for nuclear station security and provides for assurance that the public health and safety are protected. Therefore, failure to adhere to procedures for personnel screening prior to requesting unescorted access can be a violation of Federal Regulations.

C. Authorized Signatures

Before the station can grant unescorted access it must have on file a letter or form containing the name(s), title(s), and specimen signature(s) of the contractor official(s) who are authorized to sign the request for unescorted access. Requests bearing signatures not on the authorized list will not be processed.

IV. REQUESTING UNESCORTED ACCESS

Contractors shall request unescorted access on the form shown as Exhibit V. A request shall be valid for a period of one year, at which time it must be renewed.

Each nuclear station has its own process for granting unescorted access. The screening procedure is only a part of this process. The contractor should take steps to understand the process and allow sufficient time to complete all steps. This will prevent delays in obtaining unescorted access badges once contractor employees reach the station.

V. DOCUMENTATION

A. General

The contractor's screening program must provide for complete, accurate documentation of all its parts. Federal Regulation provides for periodic audit of screening programs by the Nuclear Regulatory Commission and by the Commonwealth Edison Company Quality Assurance Department. Incomplete records are always interpreted to indicate inadequate screening and will lead to loss of unescorted access for the contractor personnel involved. Audits occur without warning and may be done on a basis of random selection.

B. Records

The contractor's screening documentation shall include, but not be limited to, the following:

- 1) Approved Screening Procedure
- 2) Procedure Approval letter
- 3) Authorized Signature letter
- 4) Individual Screening files (content depending upon which option is applicable)
 - a) Contractor Certificate
 - b) Union Certificate
 - c) Background check references (three)
 - d) Behavioral Evaluation record
- 5) All effective requests for authorized access
- 6) Authorized Access cancellations
- 7) Documentation of Continued Observation Program

C. Audits and Records Checks

- 1) Records checks will be made, usually for personnel newly added to the access list. These checks are to detect any difficulties encountered in the screening process and assist the contractor to maintain an effective program. Such checks will be made as deemed necessary by either nuclear station staff or corporate nuclear security personnel. Improperly screened individuals will not be granted access to the site.
- 2) Commonwealth Edison Quality Assurance audits will be made annually. The audits usually cover a random selection of contractors and contractor files for each station and are unannounced. Though it may happen that a particular contractor's records will not be scrutinized, all should be prepared to successfully pass such audits. Inadequacies will result in contractor personnel being barred from the site until records are put in proper order.
- 3) The Nuclear Regulatory Commission holds unannounced inspections of the nuclear stations. During such inspections, contractor screening records are subject to audit at the inspector's discretion. Such inspections occur as often as twice a year. Deficiencies can result in denial of access for some or all of a contractor's people, citations against the station and, if serious enough, fines.

VI. CHANGES AND REVISIONS

A. Access List Changes

We require that all contractors notify CECO immediately of the termination or change of the reliability status of any personnel for whom unescorted access has been requested. This notification will be by telephone or a personal visit followed by a written notification (See Exhibit VI).

Additions to existing access lists shall be made using Exhibit V. It is not necessary to resubmit the entire access list each time a change occurs. However, the contractor may be required, from time to time, to consolidate individual requests on a single current list.

Changes and cancellations must be signed by an official whose authorized signature is on file with CECO.

B. Procedural Changes

Revisions to an approved screening procedure must be submitted for review and approval. The letter of approval for such revisions must be in the contractor's possession before the revision may be implemented. As with the original procedure, revisions shall be submitted to the CECO. Nuclear Security Administrator.

ATTACHMENT 2

XYZ Company

Security Screening Procedure

1. This procedure will be followed for each employee of XYZ Company and each union member on the XYZ Company payroll who require unescorted access to a Commonwealth Edison Company (CECo.) Nuclear Generating Station. XYZ Company will require this procedure to be followed for any subcontractors to XYZ Company and will be responsible for ensuring that proper screening and documentation exists prior to requesting unescorted access for subcontractor personnel.

2. Option 1

For employees with three or more years of continuous employment with XYZ Company; or for union members with three or more years of continuous union membership; or for personnel with three or more years of continuous work experience in an operating nuclear station.

a.) XYZ management will certify three years of reliable and trustworthy employment based on observation and a check of the employee's work record using Exhibit I; or a union officer, or business agent, will certify three years of reliable and trustworthy union membership in good standing based upon observation and a check of work records using Exhibit II; or XYZ management will obtain satisfactory recommendation of three or more years of continuous work experience in an operating nuclear station from all employers involved using Exhibit I modified to show each employer and each period of employment.

3. Option 3

For employees with less than three years of continuous employment with XYZ Company; or for union members with less than three years of continuous union membership:

- a.) Examination and evaluation by a psychiatrist or physician, or testing evaluation similar to "Thurstone Temperament Schedule" for the purpose of observing and disqualifying persons displaying indications of emotional instability such that there is reasonable doubt the person could discharge his duties in a trustworthy and reliable manner. Such evaluation shall be documented.
 - b.) A background investigation to disclose adverse character traits that might affect a person's ability or motivation to discharge his duties in a reliable and trustworthy manner will be completed by contacting and documenting three references as follows:
 - 1) One (1) employment reference and two (2) personal character references (not relatives);
 - 2) Two (2) employment references and one (1) personal character reference (not relatives);
 - 3) If no previous employment exists, three (3) personal character references (not relatives).
4. XYZ Company will submit to the proper CECo. nuclear station, with a copy to the CECo. Nuclear Security Administrator, a letter containing name(s), title(s), and sample signature(s) of the company official(s) authorized to sign requests for unescorted access and cancellations of unescorted access.
 5. Upon completion of 2, or 3 above, XYZ management will submit a request for unescorted access using Exhibit V signed by an official designated as in 4 above.

6. XYZ Company will provide for continued observation of all personnel for whom XYZ Company has requested unescorted access to detect any signs of aberrant behavior or other indication of decreased trustworthiness. Should such behavior be detected, XYZ Company will immediately notify the CECO. Station Security Administrator by telephone or in person. Supervisory personnel performing such observation will submit every twelve months a letter certifying that he has performed the observation, listing each individual so observed and verifying that no aberrant behavior has been detected. XYZ Company will obtain the assistance of a competent psychiatrist or physician to establish a program to train supervisors in the detection of those types of aberrant behavior for which they must be alert.
7. XYZ Company will immediately notify CECO. of any termination from XYZ Company or change in reliable, trustworthy status of any person for whom unescorted access has been requested. Such notification will be by telephone or in person to the CECO. Station Security Administrator and followed by written notification using Exhibit VI.
8. XYZ Company will maintain documentation generated by this procedure as follows:
- a.) Current approved copy of this procedure
 - b.) Current letter of approval from CECO.
 - c.) Current letter of authorized signatory officials
 - d.) Screening file for each concerned individual containing (as required):
 - 1. Copy of Exhibits I or II
 - 2. Three (3) background check references
 - 3. Certificate of Behavioral Evaluation
 - e.) All current copies of requests for unescorted access
 - f.) All copies of cancellations of unescorted access
 - g.) Annual certificates of continuous observation

All documentation will be available to CECO. and the Nuclear Regulatory Commission upon request. It will be maintained at the XYZ Company general office.

Company Officer

Title

Date

EXHIBIT I

Certification of Reliable and Trustworthy Employment
XYZ Company

The employee listed below has completed three or more years of continuous employment with XYZ Company in positions which have afforded close observation of the employee.

A review of the employee's employment record for the past three years has been completed. Based on this information, I consider the employee reliable and trustworthy. I recommend clearance for unescorted access to Commonwealth Edison Company Nuclear Generating Stations.

Name _____
(Last, First & Middle Initial)

Social Security Number _____

Date of Employment _____

Manager

Date

EXHIBIT II

Union Certification of Reliable and Trustworthy Employment

Name of Union Member _____
(Last, First & Middle Initial)

Complete Address _____

Social Security Number _____

Date of Membership _____

The person listed above has completed three or more years as a member of this union. A review of the member's work record for the past three years has been completed. Based on this information, I consider this person reliable and trustworthy. I recommend clearance for unescorted access to Commonwealth Edison Co. Nuclear Generating Stations.

Name of Union _____

Address _____

Union Officer/Business Agent

Date

EXHIBIT V

Request for Unescorted Access

Nuclear Power Station

Date _____

Commonwealth Edison Company
c/o Nuclear Security Administrator
72 West Adams Street, Room 1248 E.
P. O. Box 767
Chicago, IL 60690

Reference: Approved Procedure No. _____, dated _____

The attached list of personnel, employees of

(Name of Company)	Address

have undergone the screening process established by the referenced procedure and have met the acceptability requirements. The records and reports of the screening process for the above-named are available for inspection upon request by the Commonwealth Edison Company and/or the Nuclear Regulatory Commission.

Unescorted access is requested for _____
Nuclear Power Station.

By virtue of my authority as an authorized representative of the aforesaid company or corporation, I herewith make this application.

By: _____

Name: _____
(Print or Type)

Title: _____

cc: Commonwealth Edison Company
Nuclear Security Administrator at

_____ Nuclear Power
Station(s)

EXHIBIT VI

Cancellation of Unescorted Access

Date: _____

Station Security Administrator
Commonwealth Edison Company

Dresden Station
R. R. #1
Morris, IL 60450

Quad Cities Station
P. O. Box 216
Cordova, IL 61242

Zion Station
101 Shiloh Blvd.
Zion, IL 60099

LaSalle County Station
R.R. No. 1 - Box 240
Marsielles, IL 61341

(Name of Company) (Address)

Unescorted access is hereby cancelled for the personnel listed below:

<u>Name</u> (Last, First & Middle Initial)	<u>Social Security Number</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

By: _____
Name: _____
(Print or Type)
Title: _____

cc: Nuclear Security Administrator
72 West Adams Street, Room 1248 E.
P. O. Box 767
Chicago, IL 60690

1 MS. HERRIN: Thank you.

2 JUDGE SMITH: Is he available for cross
3 examination now?

4 MS. HERRIN: Yes, sir.

5 MR. THOMAS: I have another plan.

6 JUDGE SMITH: Incidentally, I think that your
7 plans are very well drafted and they are quite helpful.

8 MR. THOMAS: Thank you.

9 CROSS EXAMINATION

10 BY MR. THOMAS:

11 Q Mr. Roulo, you indicate in your testimony, I believe, that
12 you feel the contractor screening procedure that you have
13 identified there provides assurance that there is no
14 increased risk during the employment of transient workers;
15 is that correct?

16 A Yes.

17 Q And by risk, are you -- I take it you are talking about
18 both safety and from an exposure standpoint, as well as
19 sabotage; is that correct?

20 A I did not address those first two items in the testimony,
21 only sabotage.

22 Q Just sabotage?

23 A Correct.

24 Q I take it you would agree that no -- that there are no two
25 that no two Westinghouse PWR's are alike and -- strike

1 that. strike that.

2 The temporary workers, of course, will be working at
3 a variety of different plants and different types type of
4 reactors; correct?

5 A As far as I know, yes.

6 Q And yet you believe that they can do the work with the
7 same security risk as permanent employees who were working
8 in the same setting day by day and year by year?

9 A I don't follow your question.

10 Q Well, let me put another question.

11 The contractor screening procedure which you
12 describe, basically, puts the responsibility for providing
13 assurance against sabotage on the contractor itself.
14 doesn't it?

15 A Yes.

16 Q As opposed to Commonwealth Edison; correct?

17 A As opposed to us doing the screening; is that what you are
18 trying to find out?

19 Q No. As opposed to really putting the responsibility for
20 doing the screening on Commonwealth Edison.

21 A Yes.

22 Q Now, in, I believe, Appendix 2 at Page A 2, you set forth
23 requirements by which a person who is not a Commonwealth
24 Edison employee can receive a picture badge; is that
25 correct?

1 A What section?

2 Q Appendix A, Page A 2.

3 A Are you talking about the last paragraph?

4 Q Yes, I believe so.

5 A My whole testimony is about contractor employees. It does
6 not involve Edison employees.

7 Q Right. But, basically, a person who is not a Commonwealth
8 Edison employee can receive a picture badge; correct?

9 A He can receive unescorted access, therefore, he would get
10 a picture badge, if he meets the criteria.

11 Q Right. That is set forth on that page. Actually, I think
12 it's the top paragraph that I am referring to on that, on
13 Page A 2.

14 A Okay.

15 Q Now, permanent employees, their presence on a security
16 sensitive job can be checked by asking fellow employees,
17 "Is this Betty Johnson?" and they can vouch that that is
18 Betty Johnson; but with regard to temporary employees,
19 there is no check other than the badge, is there?

20 A They would have to identify themselves initially.

21 Q But they could do that identification based on the badge
22 itself, couldn't they?

23 A No.

24 Q What other information would they need in addition to the
25 information on the badge?

1 A The information that the contractor furnishes, name,
2 address, date of hire, Social Security No. It can all be
3 checked up upon entry prior to issue of a badge.

4 Q Is that checked when each person entered?

5 A Yes.

6 Q They are required to recite all of that information?

7 A Basically, the key is the Social Security No. If they
8 have that information, then they can check the rest of the
9 information on the request for unescorted access.

10 Q And is every person who is allowed in or who is granted
11 access asked for their Social Security No.?

12 A Generally name and Social Security No.

13 Q Okay. Is every person asked their name and Social
14 Security No.?

15 A To my knowledge, yes.

16 Q Have you had any experience regarding lost or stolen
17 badges, picture badges?

18 A Personal experience or knowledge of?

19 Q Well, corporate, corporate, you know, knowledge.

20 A I have knowledge of lost badges, yes.

21 Q If you had a lost badge and a name and a Social Security
22 No., then you could gain access; is that correct?

23 A Wrong.

24 Q Why?

25 A Without going into the security of the plant, which I

1 wouldn't want to do, there are ways and means to reject
2 that badge from the system.

3 MR. MILLER: Well, your Honor, it seems to me if
4 we are going to go into the details of Commonwealth
5 Edison's industrial security plan, then we will have to
6 have essentially an in camera session. As the Board
7 knows, this is confidential information and it's protected
8 from dissemination to the public for the very reasons of
9 having a secure plant.

10 MR. THOMAS: I don't have objection.

11 JUDGE SMITH: That would be the case. However,
12 I think he answered it very well without going into the
13 security.

14 Do you generally expect to have a cross examination
15 that will require -- let's look at your cross examination
16 plan.

17 MR. THOMAS: Well, we are dealing with the area
18 of sabotage. I don't know how --

19 MR. MILLER: The precise means by which
20 Commonwealth Edison protects the integrity of its security
21 plan is something that certainly the Commonwealth Edison
22 Company doesn't want disclosed to the general public.

23 JUDGE SMITH: Yes, we certainly understand that.

24 MR. THOMAS: I don't have any problem with them.

25 JUDGE SMITH: It does seem to me when you are

1 talking about the general subject of sabotage, if there is
2 ever an aspect of the security plan that you want to keep
3 confidential, we will do that. So you are making an
4 affirmative motion that this be an in camera session.

5 MR. THOMAS: And I have no objection to the
6 motion.

7 JUDGE SMITH: Is that correct, Mr. Miller?

8 MR. MILLER: Yes, sir, if we are going to pursue
9 this line of questioning and he wants details on how lost
10 badges are dealt with.

11 MR. THOMAS: The Staff would certainly support
12 that motion.

13 JUDGE SMITH: I think that there may be some
14 questions that would involve the security plan, so we will
15 make this a private session and we will have to ask
16 everyone not necessary to the proceeding to leave.

17 We appreciate the good nature that the audience is
18 expressing at the moment.

19 THE VOICE: Judge Smith.

20 JUDGE SMITH: You just seem to be unlucky two
21 days in a row.

22 THE VOICE: Will this be made a part of the
23 transcript?

24 JUDGE SMITH: No, it will not be made part of
25 the publicly available transcript. It will be handled

1 separately.

2 THE VOICE: Will there be any part that will be
3 allowed in the public transcript, the parts that did not
4 specify?

5 JUDGE SMITH: If there are, I will remember. As
6 a matter of fact, if the parties don't object to your
7 remaining, with your commitment that you will honor the
8 secret nature of it, maybe that would solve the problem
9 itself.

10 MR. THOMAS: Judge Smith, the Staff would have
11 to pose an objection to anyone being present beyond those.

12 In addition, I think there will be a matter of need
13 for non-disclosure statements even from those individuals
14 who do not have security.

15 JUDGE SMITH: Well, security agreements, which
16 we can extract right here, I believe. That is, we will
17 have to ask you to leave and I regret that.

18 MR. MILLER: Judge Smith, I would just like to
19 inquire as to whether Dr. Morgan and Mrs. Johnson are --

20 JUDGE SMITH: I really don't believe that either
21 are necessary. This is not only those who -- well, I do
22 believe that the League of Women Voters is entitled to a
23 representative here; but I think that Dr. Morgan should be
24 asked to -- as a matter of fact, you can take the day off
25 now, Dr. Morgan. We won't be coming back to your problem

1 until tomorrow.

2 MR. MORGAN: Thank you, your Honor.

3 JUDGE SMITH: All right. We can make that
4 assurance that he doesn't have to hang around.

5 MR. MILLER: I will accept Mrs. Johnson's
6 representation that she will execute an appropriate
7 agreement with respect to the substance of the testimony.

8 JUDGE SMITH: In the meantime, will you commit
9 to keeping the information you find out about the security
10 plan as a condition of being allowed to remain and
11 participate; will you commit to keeping it secret?

12 MS. JOHNSON: I will.

13 JUDGE SMITH: Now, are you familiar with the --

14 THE VOICE: Judge Smith, I have to ask again.
15 Will there be a transcript that will include all the
16 testimony with the specifics about the Edison security
17 plan?

18 JUDGE SMITH: There will be a transcript, yes.
19 You have asked twice and I am troubled by the fact that it
20 seems to me an extremely simple question and maybe there
21 is something about it that I don't understand.

22 THE VOICE: We have no desire to know what their
23 security is but we do want to know what disposition is
24 being made and what questions are being asked.

25 Do you understand?

1 JUDGE SMITH: No, I guess I didn't understand.
2 Explain to me what your concerns are.

3 THE VOICE: All right. We want to know what
4 types of questions are asked and what types of responses
5 the witness is able to give and we want to know the input
6 that you are going to have without knowing specifics about
7 the security system itself.

8 JUDGE SMITH: The chances are that you will not
9 know anything more than the testimony which has already
10 been filed and served, unless it develops that there are
11 large portions of it, of the testimony, that should not
12 have been in camera and we will try to make an attempt to
13 break up that which might be secret and that which is not,
14 because the commission and the law disfavors secret
15 hearings and we can only do it where it is essential for a
16 purpose such as this. However, it is quite possible there
17 will be a substantial part of the testimony and a
18 substantial part of our decision which will remain
19 private.

20 THE VOICE: Okay. If you are making that
21 effort. I will pass that on to the editor.

22 Thank you.

23 JUDGE SMITH: Certainly, we will. Let's follow
24 that procedure. Let's see if you can't, in the in camera
25 proceeding, group all of your line of questioning into the

1 security part as compared to those that are, obviously, on
2 the direct testimony.

3 MR. THOMAS: Fine.

4 JUDGE SMITH: Do you understand that?

5 MR. THOMAS: Yes. I am just looking over now
6 what my questions will be. It may be that this is the
7 only area, although it's sometimes difficult for me to
8 know what Commonwealth Edison considers a part of their
9 security procedure.

10 JUDGE SMITH: Here is how we can handle it.
11 Let's number the in camera aspect of it separate
12 numbering. We will continue on with the regular
13 transcript numbering for the main proceeding but we will
14 have a separate numbering system beginning with 1 for in
15 camera. Then if we see a need to go back to the in
16 camera, we will pick up sequentially.

17 Moreover, I won't see any need -- strike that last
18 moreove..

19 Now, Mr. Reporter, let's go off the record.

20 (There followed a discussion outside the
21 record.)

22 MR. THOMAS: Judge, may I ask whether it is
23 possible to ask that the reporter not deliver next day
24 copies until we have had a chance to consider further what
25 other steps may be necessary in terms of maintaining the

1 security of the in camera portions of the transcript?

2 JUDGE SMITH: Well, copies are delivered solely --
3 I don't know what the arrangement is with the utility.
4 They are the one who have an interest. We receive four
5 copies and two go to you and two go to us and that's it.

6 MR. THOMAS: I understand, Judge. My witness
7 who is more familiar than I with the safeguards question
8 informs me there may also be problems with the electronic
9 transmission of the materials even to Chicago.

10 JUDGE SMITH: Heavens, I just can't -- are you
11 concerned about that?

12 MR. MILLER: Maybe I am just a babe in the woods
13 about these things.

14 THE WITNESS: It's part of the safeguards law,
15 and I am sure that is what their concern is.

16 MR. SAVAGE: It's part of the law, the
17 safeguards information, and it's an unusual position and I
18 have never dealt with this.

19 JUDGE SMITH: This is not safeguards. This is
20 proprietary information. It's not safe.

21 MR. SAVAGE: Yes, it's safeguards. If it's out
22 of their security plan, it is safeguards.

23 MR. THOMAS: For that reason, Judge, it is not
24 within Applicant's power to waive the security provisions.

25 JUDGE SMITH: In the Diablo Canyon security

1 proceeding, the Appeal Board refused to give it any more
2 security than simple proprietary information. We will
3 have to acquiesce to your expertise on that.

4 MR. THOMAS: We will move expeditiously. Judge,
5 and inform the Board as soon as possible if there is the
6 need for these stops.

7 JUDGE SMITH: I will really not expect to have a
8 need for next day transcripts on it, and would you object,
9 Mr. Miller, if we just --

10 MR. MILLER: No, sir. I will restrain my
11 curiosity until such time as we can decide this position
12 of the reporter's shorthand notes.

13 JUDGE SMITH: Okay. So you are not going to
14 transmit this section of it, Mr. Reporter, and then we
15 will decide after the decision what to do about it.

16 Now, having arrived at that point, we are not going
17 to go very late tonight, but it would be helpful if we
18 could wind up the -- well, I don't think we can. It sure
19 would be helpful if we didn't have two sessions of in
20 camera.

21 Proceed, proceed. We will see what happens.

22 MR. THOMAS: I have a feeling you are saying
23 something to me and I don't know exactly. You mean you
24 want to finish that all up tonight?

25 MR. MILLER: Yes.

1 MR. THOMAS: Fine.

2 JUDGE SMITH: I am giving you a message that you
3 just probably can't comply with, anyway. You are going to
4 have to do what you have to do.

5 MR. THOMAS: To be quite frank, I am having such
6 a difficulty formulating a coherent question at this hour
7 of the day, any message to me is only -- let's try and --
8 I will try and finish this.

9 JUDGE SMITH: If you don't think you can
10 complete the in camera session, for implicitly then, let's
11 have one continuous piece of testimony, if we possibly can
12 and let's don't go into the -- let's don't get into the
13 sabotage aspects of it. As a matter of fact, why don't we
14 adjourn for the night.

15 MR. THOMAS: That's fine with me.

16 JUDGE SMITH: I will give everybody a chance to
17 figure out what the problems are and your witness can
18 figure out what he might be faced with and it might be
19 helpful, if you don't mind, to review with the witness the
20 area that you are going to go into.

21 MR. THOMAS: I don't mind; I don't mind.

22 JUDGE SMITH: If you don't mind, have a
23 conference afterwards, after we go off the record, tell
24 him what you are asking about so he can think and
25 contemplate the security aspects of it.

1 MR. THOMAS: All right, okay. That is no
2 problem.

3 There is one other potential area which I will
4 discuss with him, too, so we can get it all hammered out.
5 There is only one other area of the cross that I could see
6 that could even border on any sort of a security risk,
7 although the way these things are defined sometimes, it's
8 hard to know.

9 JUDGE SMITH: The escort procedures is the one
10 that I recognize as being a potential.

11 MR. THOMAS: I also thought the union
12 certification could possibly present a problem.

13 JUDGE SMITH: Why don't you discuss the areas
14 which might be, so that you can be better organized
15 tomorrow morning?

16 MR. THOMAS: Very well.

17 JUDGE SMITH: Anything before we adjourn for the
18 night?

19 MR. MILLER: Judge Smith, shall we find out what
20 has been going on with our closeted friends?

21 JUDGE SMITH: I saw them come in and leave with
22 a look of disgust on their faces.

23 MR. MILLER: Really? The last report I had was
24 moderately encouraging.

25 JUDGE SMITH: Well, let's give it a try. It

1 would be helpful if we had a brief report. We can't go
2 into much of an argument tonight.

3 MR. THOMAS: Judge, there is one other
4 scheduling matter which I --

5 JUDGE SMITH: You know, I did promise -- I did
6 promise the representative of the newspaper that the only
7 thing -- that she could leave without any concern and she
8 would miss any news and the only thing we are going to
9 have is secret stuff tonight and that would be a breach.

10 MR. THOMAS: Okay, okay, all right.

11 JUDGE SMITH: Now, if you want to talk about --
12 what else did you want to talk about?

13 MR. THOMAS: It was just a scheduling matter
14 with Dr. Morgan.

15 JUDGE SMITH: That's all right. My reference
16 was to bringing in the report on the emergency planning.

17 MS. JOHNSON: This is Dr. Morgan.

18 JUDGE SMITH: Okay. Let's adjourn for the night
19 and the scheduling can be off the record.

20
21 (Whereupon at 5:10 P. M., the hearing
22 in the above-entitled matter was
23 recessed, to reconvene at 9:00
24 A. M. on Wednesday, March 9,
25 1983.)

