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Transcript of Proceedings

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

DEPOSITION OF JOSEPH D, KANE

VOLUME VI

50-329

Bethesda, Maryland

Thursday, 4 December 1980

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the matter of:	:	Dockets Nos.:	50-329-OM
CONSUMERS POWER COMPANY	:		50-330-OM
(Midland Units 1 and 2)	:		50-329-OL
_____:			50-330-OL

DEPOSITION OF JOSEPH D. KANE

VOLUME VI

Bethesda, Maryland

Thursday, 4 December 1980

Deposition of JOSEPH D. KANE resumed, pursuant to adjournment, at 8:40 a.m., in Room P-114, Phillips Building, 7920 Norfolk Avenue, Bethesda, Maryland, before William R. Bloom, a notary public in and for the District of Columbia, when were present on behalf of the respective parties:

On behalf of the Applicant:

RONALD ZAMARIN, Esq. and ALAN S. FARNELL, Esq.,
Isham, Lincoln and Beane, One First National
Plaza, Chicago, Illinois

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JAMES E. BRUNNER, Esq., Consumers Power Company,
212 W. Michigan Avenue, Jackson, Michigan
On behalf of the Regulatory Staff:
WILLIAM D. PATON, Esq. and BRADLEY JONES, Esq.,
Office of Executive Legal Director,
United States Nuclear Regulatory Commission,
Washington, D. C.

C O N T E N T S

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Witness

Cross-Examination

JOSEPH D. KANE (Cont'd)

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Exhibits

(None)

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P R O C E E D I N G S

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Whereupon,

JOSEPH D. KANE

resumed the stand, having been previously duly sworn, and was examined and testified further as follows:

MR. PATON: The Staff wants to make a statement about the continuation of the deposition of Mr. Kane.

We are now in our sixth day of Mr. Kane's deposition. The Staff feels that it has been more than reasonable in cooperating with the applicant with respect to his deposition. We did not require strict compliance with our regulations. Mr. Kane agreed to travel to Detroit at one point and have his deposition taken because it was for the convenience of the applicant. And we think that five full days of deposition is beyond a reasonable amount.

We note applicant's intent to continue his deposition today. So, after carefully considering the matter, we have indicated to the applicant that we are willing to have Mr. Kane's deposition continued for one more hour. But, beyond that, we think that we will no longer volunteer Mr. Kane as a witness in the deposition.

MR. ZAMARIN: Well, my position is as I stated it

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1 to you: we are continuing with his deposition.

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I think it is not only nonsense but it is simply not true that we're in our sixth day. There were two days in Detroit and a partial day in Detroit where we ended early in order to accommodate the travel plans of the Staff. Yesterday we stopped at three-thirty in the afternoon because of commitments that Mr. Kane had. The previous day we stopped at five, where otherwise it had been the experience and practice to go to six.

And the statement that he traveled to Detroit for our convenience is absolute nonsense, and it's simply not true. We resumed his deposition in Detroit since he has taken somewhat of an advisory role in this, and I was going to be in Detroit anyway for depositions that week, and we therefore decided, rather than traveling back to Washington to take his deposition, that we would take it there. And I think your memory will bear that out.

My position is that in taking his deposition I've had trouble getting straightforward answers to questions. If he had answered questions without the necessity repeating them, without the necessity of cross-examination in some areas, and without the necessity

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1 of having a question read back several times and asking for
2 a direct answer, his deposition probably would have been
3 completed in a day and a half.

4 I don't know what it is you want to hide by
5 refusing to let him go on, but there has got to be some
6 reason beyond simply saving time. And my intention is to
7 continue the deposition until it's completed. And I think
8 that any attempt by the Staff to cut off that discovery, in
9 my mind must be an attempt to try to hide something that the
10 applicant ought to know.

11 MR. PATON: I would like to respond that your
12 repeated statement, allusion to the fact that the Staff has
13 got something to hide, represents your volunteered injection
14 into these proceedings of something that is totally
15 unnecessary.

16 The comment with respect to traveling to Detroit:
17 my recollection is that Mr. Kane was originally scheduled to
18 have his deposition taken here, but that then you were
19 going to take the depositions of the Corps in Detroit, and
20 there was an agreement that Mr. Kane would travel to Detroit
21 and have his deposition taken first. My recollection is
22 that his deposition was to be completed, and then he would

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1 be there and be able to watch you take the deposition of the
2 Corps. But I don't think that's a big factor.

3 I think overall my statement is that five days is
4 more than reasonable. And that's our position.

5 MR. ZAMARIN: I couldn't agree more. One and a
6 half days would have been reasonable if we had gotten direct
7 answers. I think it could have been done in a day and a
8 half.

9 CROSS-EXAMINATION (Continued)

10 BY MR. ZAMARIN:

11 Q Mr. Kane, you realize you're still under oath,
12 don't you?

13 A I do.

14 Q With regard to the recharge from the cooling pond
15 during the time of the diesel generator building surcharge,
16 do you, based upon your experience and expertise as a
17 geotechnical engineer, have an estimate as to the amount of
18 time it would take for the water table in the area of the
19 diesel generator building to respond to a rise in the
20 cooling pond to 627 feet 2 inches?

21 A The time it would take to respond is dependent on
22 the permeability of the materials that it would pass

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1 through. And we had discussion similar to this nature in my
2 past deposition, of where I suggested analyses to evaluate
3 why the pore pressures never raised to the level they did.
4 You can look at that information; the information being the
5 soils, the layering, the permeability between the cooling
6 pond and the diesel generator building. Until I know that
7 information in detail I would not want to make an estimate
8 of the time.

9 Q Could you describe for us the mechanism of
10 recharge; in other words, how it is that water in the pond
11 somehow affects the water table underneath the diesel
12 generator building?

13 A When you introduce a new source of water such as a
14 pond or a lake there is a period where that pond has to
15 develop a gradient. And initially the gradient which would
16 be expected would be more vertical until the lower portion
17 becomes saturated, and then you would expect an outward
18 development of the gradient off the pond as it passes
19 through the materials to the diesel generator building area

20 Q What do you mean by a gradient?

21 A I mean the difference in water elevation between
22 the source, which would be the pond, to the point where it

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1 would connect up with the groundwater, the existing
2 groundwater.

3 Q So are you saying, then, that water from the
4 cooling pond would actually travel to the area underneath
5 the diesel generator building?

6 A If it is a higher elevation than the natural
7 groundwater table, yes.

8 Q Have you ever heard of any case of consolidation
9 tests being conducted after a preload?

10 A A preload program similar to Midland; is that your
11 question?

12 Q After any preload.

13 A I've heard of consolidation tests being taken
14 after an embankment was placed to understand the change in
15 soil characteristics because of that embankment loading.
16 And in that sense the embankment loading itself would be the
17 preload.

18 Q -Okay.

19 So what you're saying is that in an embankment
20 loading, that that is analogous in geotechnical terms to a
21 preload?

22 A I had asked whether you wanted me to reference it

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1 to Midland because there are problems with Midland, in my
2 mind, of calling it a preload when in fact the load was
3 added after the structure was built.

4 If we're talking about—

5 Q I understand that. That's why I asked you. I'm
6 not restricting it to Midland. I just wanted to know if in
7 fact you ever heard of consolidation tests being done after
8 preload.

9 A In the sense of preloading — and that is what I
10 think is generally accepted by the engineering profession,
11 and that is, where a load is placed on a soil deposit before
12 a structure is built to cause a settlement to occur before
13 the structure is built — I've indicated in the past that in
14 my professional experience I do not have a lot of experience
15 with that type of preloading, and, therefore, in my
16 experience I do not know of consolidation tests that were
17 taken after those operations were performed.

18 Q All right.

19 Now, have you limited your answer now to just
20 preload such as was done with the diesel generator building
21 at Midland? I'm not clear on that.

22 A I have accepted that condition.

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1 Q Okay.

2 A And I have attempted to define what I understand
3 Is the preloading process normally talked about in the
4 engineering profession.

5 Q Okay.

6 And with regard to the normal preload that is
7 commonly talked about in the engineering profession, you're
8 not aware of consolidation tests ever having been done after
9 preload; Is that right?

10 A That is correct.

11 Q With regard to a surcharge treatment such as that
12 which was done at the diesel generator building, have you
13 ever heard of consolidation tests being done after that?

14 A I have yet to locate a project where surcharging
15 after the structure was built has been completed. I have
16 searched the literature and I continue to search the
17 literature. So, therefore, I do not know of any
18 consolidation tests that were taken after surcharging a
19 structure.

20 Q You say you've searched the literature. Do you
21 mean you've searched the engineering literature and you have
22 found no case where a surcharge was imposed after a

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1 structure was completed? Is that what you're saying?

2 A I have indicated to you in past depositions—

3 Q Well,—

4 A Would you allow me to finish?

5 Q I'm just trying to understand your previous answer
6 is all I'm referring to. I didn't understand what you
7 said. You said you'd searched the literature, and then you
8 didn't say what happened.

9 A Well, you keep making movements, and I'm not sure
10 how I can interpret them.

11 What I'm saying is, in my previous deposition I
12 have given you the source of a book which I understood
13 contained a paper of a structure that had been surcharged
14 after completion. I have attempted to find that article in
15 what I understood was the publication. I have not located
16 that to date.

17 Q Okay.

18 My question again, though, is: When you say
19 you've searched the literature, you mean you've searched
20 the engineering literature but you could not find any
21 article or any reference with regard to a surcharge of a
22 structure after it was completed, but for this one that you

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1 had reference to? But you still couldn't find that,
2 either. Is that what you meant by your previous answer?

3 All I'm getting at is, you said "searched," but
4 you didn't say what happened after you searched.

5 A I have not found one.

6 Q Okay.

7 A But I also would like to indicate that I have
8 contacted members of the Corps of Engineers other than the
9 Detroit District, particularly the Waterways Experiment
10 Station, and other division offices, attempting to
11 understand whether they had this similar type of
12 construction, and I was unable to locate anyone with that
13 experience.

14 Q Did you ask any of them whether they were aware of
15 any instances — whether they had it, or somebody else had
16 it, or whether it was in the literature, or anywhere else?

17 A I did.

18 Q And they told you they did not?

19 A To their recollection, they did not.

20 Q Okay.

21 Have you ever heard of someone named Terzagli?

22 A Yes.

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1 Q Are you familiar with articles or texts written by
2 Terzaghi?

3 A Yes.

4 Q Who is Terzaghi? I believe it is Karl Terzaghi.

5 A That's correct.

6 He's considered the father of soil mechanics.

7 Q Obviously, then, an authority on soil mechanics?

8 A Yes.

9 Q Is it a commonly accepted practice, in your
10 opinion as a geotechnical engineer, to perform consolidation
11 tests after a preload?

12 A Isn't that the same identical question?

13 Q No. I had asked you before if you knew of any.
14 Now I'm just asking if it is a commonly accepted engineering
15 practice. So it's a different question.

16 A I don't think preloading, particularly with
17 structures such as nuclear power plants, where the safety is
18 that much more significant, I don't think preloading has
19 been done on a large enough scale to say there is a widely
20 accepted engineering practice about either taking
21 consolidations before or after the surcharging operations.
22 And so, on the basis of that I've indicated to you in the

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1 past that is, I do not have a great deal of experience with
2 preloading. I do not know, after attempting to understand
3 preloading and its advocacy to the nuclear power plant
4 project field and other fields, whether there is a common
5 practice of taking consolidation tests afterwards.

6 In my opinion, it is a unique enough process, and
7 the importance at Midland is important enough, that I would
8 be encouraged to take the consolidation tests.

9 Q My question was — whether it is with regard to
10 nuclear plants or Midland or anything else, or whether you
11 would be encouraged to take them — to your knowledge is it
12 a commonly accepted engineering practice to do consolidation
13 tests after preload?

14 MR. PATON: Let me ask for clarification. Do you
15 mean, disregarding whether it's nuclear or not? Is that
16 what you said?

17 MR. ZAMARIN: My question was in general, and he
18 qualified it by referring to Midland. And that was not
19 anywhere in my question.

20 MR. PATON: Okay.

21 THE WITNESS: I think it is necessary to address
22 the significance of the structure to be able to answer that

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1 question. You do things differently depending on the
2 structure involved and its safety significance. And I think
3 you must— In some cases there would be no need. If you
4 were building a warehouse which would suffer no
5 consequences, there would be no need to do it. If you're
6 building something of safety significance, such as a nuclear
7 power plant or a dam, there very well may be a need to do
8 it.

9 I think I must answer in that regard.

10 BY MR. ZAMARIN:

11 Q I'm really not talking about a need. Is it a
12 fact, then, you're simply not aware whether it's a commonly
13 accepted engineering practice in certain instances?

14 You keep bringing it back to whether there's a
15 need or not. I'm talking about commonly accepted
16 engineering practice.

17 A You're asking me my opinion about a commonly
18 accepted engineering practice, and I can only give you my
19 feelings. I can't answer for someone else.

20 Q All right.

21 So what you're saying is that you don't know, or
22 you can't testify as to what commonly accepted engineering

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HBW 1 practice is in the engineering industry?

2 A I think I have indicated that preloading is not so
3 widely used that you can clearly identify what is commonly
4 accepted, and that you would have to take it on an
5 individual basis and on the significance of the structure.

6 Q I take it, then, that your answer is no, that
7 you're not aware, then, of a commonly accepted engineering
8 practice with regard to running consolidation tests after
9 preload?

10 A That is correct. And I have given you my opinion.

11 Q Are the physical laws or principles that govern
12 consolidation different for nuclear plants than for
13 warehouses?

14 A No. The safety significance is what is the
15 difference.

16 Q But the physical aspects of consolidation, and the
17 mechanics of consolidation, wouldn't differ at all, would
18 they?

19 A That is correct.

20 Q Under static loads would it make any difference
21 with regard to settlement of the structure if there were
22 hard spots supporting the diesel generator building?

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1 A It would be less of a concern if we were only
2 dealing with static loads.

3 Q Would it still be a concern?

4 A Would you repeat the question, please?

5 MR. ZAMARIN: Read the question, please.

6 (Whereupon the Reporter read from the record as
7 requested.)

8 THE WITNESS: I could think of conditions where
9 even under static load the differential settlement which
10 would result, even under static load, could cause stress to
11 a structure.

12 BY MR. ZAMARIN:

13 Q Tell me what those conditions are.

14 A To where I had under the foundation of a structure
15 a relatively incompressible soil and in another area a
16 compressible soil, and under the static load I would cause a
17 significant difference in settlement to occur to where that
18 difference in settlement could result in overstraining of
19 that structure.

20 Q Okay.

21 My question was, Under a static load would it make
22 a difference with respect to the diesel generator building

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2 building. Now, did you keep in mind in that answer that
3 we're talking about support on hard spots?

4 A I would consider the hard spots to be the
5 relatively incompressible zone, and other areas to be more
6 compressible.

7 Q Okay. Then what do you postulate would happen if
8 that would cause a change in the support provided by these
9 hard spots under static load?

10 A Depending on how the loading is applied, whether
11 more of the load could be taken up by the incompressible
12 materials, and, for some reason, either a change in live
13 load or some other load, where that would be moved at a
14 later time to be placed on the more compressible portion.

15 Q Okay. So what you're talking about, then, is a
16 change in the load, the static load; is that correct?

17 A A change in static load.

18 Q Okay.

19 So my question, however, is that under the static
20 load would it make any difference with regard to settlement
21 if there were hard spots supporting the diesel generator
22 building? And I take it what you're saying is that not

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1 unless there were some change in the static load that would
 2 move or transfer some of that load from the incompressible
 3 hard spots to more compressible materials?

4 A If a structure had come to the phase of secondary
 5 consolidation and there was no change in static loading,
 6 then the problem of having hard spots would be minimal. But
 7 if there is a change, then there could be a development of
 8 problems.

9 Q You said the problem with hard spots would be
 10 minimal. Would there be a problem at all?

11 A Actually it would depend on the difference in the
 12 rate of secondary consolidation between a hard spot and the
 13 compressible area.

14 If it were significant secondary consolidation —
 15 and you do have that with some types of soils — it could be
 16 a problem.

17 Q And you're now talking about a situation where
 18 there is some change in the loading?

19 A No. I'm talking now—

20 Q —or static loading?

21 A I'm talking about the difference in secondary
 22 consolidation between the two types of materials.

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Q You indicated that if you had a building that was

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in secondary consolidation and it was under static loading,

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and that there was no change in that static loading, that

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the problems of hard spots would be minimal.

5

A That's correct.

6

Q And what I don't understand, then, is what the

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problem would be, assuming that there's no change in the

8

loading and it's in secondary consolidation.

9

A Not all soils have the same rate of secondary

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consolidation. And I'm saying if that rate is significantly

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different between the hard spot and the more compressible

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materials, that difference in rate may cause stressing of

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the building.

14

Q How?

15

A By allowing settlement to occur in the more

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compressible material, which introduces stresses to the

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structure.

18

Q Do I understand you to say that what you

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visualize, or what you postulate now, is a structure that is

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supported on hard spots, which would be the incompressible,

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or less compressible, material, somehow being affected by

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settlement of the more compressible material which is not

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1 supporting the building now anyway?

2 A If it were only on hard spots, then there would
3 not be a problem. But if it is on both hard spots and
4 compressible materials you may have a problem.

5 Q My question, and all these questions have been
6 that it's supported on hard spots; okay? So—

7 A I'm assuming— In the past when I've used "hard
8 spots" I'm talking about an irregular foundation that
9 includes both hard spots and compressible materials. And
10 all my responses today have assumed that condition.

11 Q Okay.

12 What we're talking about is a structure under
13 static loads that is supported on hard spots; all right? If
14 that were the case with the diesel generator building, would
15 it— Strike that.

16 Under static loads, would it make any difference
17 if the diesel generator building were supported on hard
18 spots?

19 A And I have to ask: Are you referring to the
20 diesel generator building foundation being supported only on
21 hard spots?

22 Q Yes.

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W. W.B. 1 A If we assume the hard spots extend in depth to an
2 incompressible layer, then there would not be any problem.

3 Q All right. What if you assumed that they don't?

4 A Then the question becomes, during the course of
5 operation of that structure whether the additional long term
6 loading is going to cause any settlement in the material
7 under the hard spots, and whether that is a factor.

8 Q Are there any observations that you're aware of
9 with regard to the diesel generator building that shed any
10 light on that, one way or the other, for you as a
11 geotechnical engineer?

12 A There are observations in the diesel generator
13 building, and that is, the potential for hard spots being
14 introduced by the conduits, by the backfill, by the
15 excavations that you have introduced into the foundation of
16 the diesel generator building. And they are a factor in a
17 potential differential settlement of the diesel generator
18 building.

19 Q In your last answer you talked about whether there
20 was material under the hard spots which, under additional
21 long term loading, could undergo additional settlement. And
22 I'm asking you if there are any observations with regard to

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1 the diesel generator building of which you're aware as a
 2 geotechnical engineer that would shed any light as to
 3 whether that in fact may be the case.

4 A I don't think we have been given enough
 5 information ourselves to know exactly the grade elevations
 6 of all the conduits under the diesel generator building, and
 7 the backfill details of those conduits, and then to look at
 8 the material below those excavations. Some of that
 9 information has been requested in the August 4, 1980 report,
 10 for the purpose of evaluating what you are now asking me.

11 MR. ZAMARIN: Would you read the question back,
 12 please?

13 And would you carefully listen to the question?
 14 (Whereupon the Reporter read the pending
 15 question.)

16 THE WITNESS: I think I've answered your question.

17 MR. ZAMARIN: I don't think you have.

18 BY MR. ZAMARIN:

19 Q You've told me what you don't know. What my
 20 question was— Do you want to hear it again? It was: Are
 21 you aware of any observations, as a geotechnical engineer,
 22 that shed any light on it?

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MRBWB 1 I'm not asking you what you don't know. I'm asking
2 you what you do know. There's a difference.

3 A There is a difference.

4 Q Then tell me.

5 A And to answer you what I think, I say I need this
6 information to come to a conclusion whether there is—

7 Q Fine; but that wasn't my question. You have to
8 answer the question. You're telling me what you need for a
9 conclusion. All I'm asking you is what you're aware of,
10 what you've observed. That's what I want to know.

11 MR. PATON: I will instruct the witness he can
12 certainly explain the answer.

13 MR. ZAMARIN: He can explain them if I ask him the
14 question. He wants to answer a different question. This
15 has been the problem all along.

16 I didn't ask him what he needs to know to form a
17 conclusion. And that's what he wants to tell me.

18 BY MR. ZAMARIN:

19 Q I want to know what you do know, whether that's
20 enough to form a conclusion or not, what you do know that
21 sheds some light on this.

22 A I do know that the conduits ar up in the fill. I

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WRBwb 1 do know that there is plant fill in locations beneath those
2 conduits. Because I do not know the exact grades of some of
3 your conduits, I do not know whether there is a problem.

4 I'm assuming you're asking me not just what I know
5 but whether you feel — I feel it is a problem.

6 Q No, I didn't ask you that.

7 A Okay. Fine.

8 Q I didn't ask you that.

9 A It's my understanding, then, that the conduits sit
10 on top of the fill. That's what I know.

11 Q Okay.

12 Are there any other observations, other than what
13 you have just told us, and that is that you know the
14 conduits sit on the fill, that shed any light as to whether
15 there is material under the hard spots which, after
16 additional long term loading, could undergo further
17 settlement and, therefore, cause a problem with the diesel
18 generator building? Or is that it?

19 A You're asking me do I know whether there is soft
20 material under the hard spots?

21 Q No.

22 MR. ZAMARIN: Would you read the question back,

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WRSwb 1 please?

2 (Whereupon the Reporter read the pending

3 question.)

4 THE WITNESS: I have no observations. I have
5 concerns.

6 BY MR. ZAMARIN:

7 Q In your opinion, are the only hard spots that
8 could be supporting the diesel generator building, conduits?

9 A No. There could be hard spots because of
10 excavations that you placed in the diesel generator building
11 area, particularly along the north side, which would be the
12 granular fill, which may also be introducing hard spots.

13 Q Is there anything else that in your opinion could
14 be introducing hard spots which are supporting the diesel
15 generator building?

16 A Between conduits and the backfill, and the
17 backfill for other excavations, I cannot think of others.

18 Q Okay.

19 When you talk about backfill for other
20 excavations, you're not talking about all the fill under the
21 diesel generator building, are you?

22 A No. I'm talking about, after you place the fill

WRBwb

1 then you complete excavations and backfill with a different
2 material.

3 Q Have you reviewed Consumers Power Company's
4 seismic shakedown analysis?

5 A Would you explain what is meant by "seismic
6 shakedown analysis?"

7 Q Well, are you aware of a seismic shakedown
8 analysis that was performed by Consumers Power Company?

9 A I don't recognize anything that I have reviewed as
10 a seismic shakedown analysis.

11 Q Okay.

12 So when I say "seismic shakedown analysis" with
13 regard to the Midland site or the Midland fill problem, you
14 don't have any idea what I'm talking about?

15 A I have ideas of seismic stability. But I don't
16 recognize it as seismic shakedown.

17 Q Okay.

18 Have you ever heard the expression "seismic
19 shakedown?"

20 A Not generally, no.

21 Q You say "not generally." How about specifically?
22 I mean, have you heard of it some other way?

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1 A I've heard of seismic stability, I've heard of
 2 soil-structure interaction, I've heard of liquefaction
 3 studies. But I have not heard of seismic shakedown.

4 Q Is there some phenomenon of which you're aware
 5 with regard to shakedown of sands by seismic action?

6 A Yes.

7 Q What's that called?

8 A Vibration-induced settlement.

9 Q You've never heard that referred to as seismic
 10 shakedown?

11 A Not as— I've heard people talk about shakedown,
 12 but I don't recall hearing engineers use that term.

13 Q Okay.

14 Are you aware of any analysis by Consumers Power
 15 Company with regard to that, as it relates to the diesel
 16 generator building?

17 A Based on the responses to some of our questions,
 18 where they have analyzed additional settlement because of
 19 vibrations from an earthquake event, I have heard of it,
 20 yes.

21 Q What is your opinion of their analysis?

22 A I have not reviewed that in detail. It's my

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1 understanding, based on the work of Dr. Hadala from the
 2 Waterways Experiment Station, that that aspect has been
 3 addressed.

4 Q And what is the conclusion of that addressing of
 5 that analysis?

6 A May I refer to the August 4, 1980 report which
 7 summarizes Dr. Hadala's conclusions?

8 Q Sure.

9 A Do you have a copy?

10 Q Not in front of me.

11 (Pause)

12 I have here the July 7th, 1980 Corps Report which
 13 was transmitted to Consumers Power Company on August 4th,
 14 1980.

15 (Handing document to the witness)

16 Is that what you say you need to look at in order
 17 to tell me what the opinion of Consumers Power Company's,
 18 what I call "seismic shakedown analysis" is?

19 A You've introduced— I'm referring to this to
 20 indicate that— This is Consumers' idea of seismic
 21 shakedown. I'm referring to this to indicate Dr. Hadala's
 22 analysis of settlement under vibratory motion such as an

WRBwb

1 earthquake.

2 Q Okay.

3 My question was, were you aware of an analysis
4 that was provided by Consumers in that regard? And you said
5 Yes, you hadn't studied it in detail but that Hadala had
6 done work on that. And I asked you if there was, then, some
7 opinion with regard to that analysis by Consumers that came
8 out of Hadala having addressed it. And I thought you said
9 that there was, but you had to refer to that July 7th Corps
10 letter.

11 A What I am referring to is what I understand are
12 Dr. Hadala's conclusions on the amount of settlement which
13 could occur because of seismic motion.

14 Q Okay.

15 My question was whether anyone had reviewed, or
16 analyzed the analysis that had been provided by Consumers.

17 A I think it was analyzed independently by
18 Dr. Hadala, by his making this analysis.

19 Q Okay.

20 Based upon that, can you tell me what his
21 conclusion with regard to Consumers' analysis was?

22 A I would like to find it in here. And I think he

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WRBwb 1 makes his conclusion.

2 (Pause)

3 Rather than wasting the time, I'll try and recall what
4 I remember Dr. Hadala's summary said.

5 Q Okay.

6 A That based on his independent analysis he
7 concluded the magnitude of settlement which had been
8 indicated by Consumers was a reasonable limit for that type
9 of concern.

10 Q Was that "a reasonable limit?" I didn't hear what
11 you said.

12 A Dr. Hadala's independent analysis produced a value
13 which was comparable to the results of Consumers Power.

14 The reason it is not readily available in that
15 report is that the Detroit District took Dr. Hadala's report
16 and organized it into that final report that you have there.

17 Q To your knowledge, did anyone review Hadala's
18 work?

19 A I guess I would have to understand what you mean
20 by "review." I think it was generally read and accepted,
21 and no additional work was done on it.

22 Q That's what I meant.

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WRBwb 1 You have indicated that you are not sure that the soil
 2 beneath the diesel generator building is in secondary
 3 consolidation. Taking into account all of the evidence or
 4 data demonstrating that the soil is in secondary
 5 consolidation, and weighing that against all of the
 6 information known to you that you believe casts doubt on
 7 whether that soil is in secondary consolidation, do you
 8 believe it is more likely than not that the soil is in
 9 secondary consolidation?

10 A I believe Consumers has a tremendous advantage in
 11 being able to conclude it, since you have what we discussed
 12 on numerous occasions, and that is the settlement versus
 13 time readings which we do not have. Provided that
 14 information, maybe I can gain additional confidence.

15 But, like the Corps of Engineers who originally
 16 asked for the borings in the diesel generator building, I
 17 think it is good engineering practice, in recognition of the
 18 safety of the structure, in recognition of the problems with
 19 preloading, in recognition of the irregularities that we
 20 have in the foundation, to go and take the borings, do the
 21 laboratory consolidation tests, and use that information in
 22 conjunction with the information that you have and make the

3wb

1 decision.

2 MR. ZAMARIN: would you read the question back,
3 please?

4 And listen carefully to the question.
5 (whereupon the Reporter read the pending
6 question.)

7 THE WITNESS: The important words are "known to
8 me." And I'm saying I do not know the settlement history
9 of all the markers except one with regard to time, and those
10 plots we have asked for.

11 I think based on knowing only up to the time after
12 surcharge removal, I cannot make a conclusion.

13 You're asking me to make a judgment based on
14 information back to that time. If that's the time you're
15 pinning me to, then I'm saying I don't know, I don't know
16 whether we're in secondary consolidation or not.

17 BY MR. ZAMARIN:

18 Q I'm not asking you whether you know; I'm asking
19 you, weighing all of the evidence on one hand and all of the
20 evidence on the other hand, whether you believe it is more
21 likely than not — not whether you know, but whether you
22 believe it is more likely than not — that it's in secondary

MRBwo

consolidation?

2 A Is it agreed that I'm weighing the evidence as of
3 the date of your graphs of settlement versus time after
4 surcharge removal, and not the graphs that you have in your
5 possession? Is that the time frame you're asking me to
6 answer?

7 Q Tell me what time frame it is that you can answer
8 it in. I mean, I'm asking you to take into account the data
9 that is known to you. So if it is as of a particular date,
10 then tell me what that date is.

11 A The data that I have confidence in the data is
12 after surcharge removal, and not to the present time.

13 Q All right.

14 A As of that date I think it is possible that we are
15 in secondary consolidation.

16 Q Do you think it is more likely than not?

17 A I don't want to speculate.

18 Q I'm not asking you speculate; I'm simply asking
19 you, weighing the data, whether you think it is more likely
20 than not that it's in secondary consolidation?

21 MR. PATON: Let me encourage the witness to answer
22 the question, unless he thinks his answer would be pure

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1 speculation, and then I think it really wouldn't be fair for
 2 him to answer. If he thinks it would be speculation, then
 3 I would advise him not to speculate. But if he can give an
 4 answer, I would encourage him to answer.

5 MR. ZAMARIN: Well, I assume he's basing it on
 6 evidence and data that has been something other than
 7 speculation.

8 MR. PATON: He may not have enough evidence and
 9 data to make even an informed—

10 MR. ZAMARIN: (Interposing) —speculation?

11 MR. PATON: No. I'm asking him to draw that line.

12 THE WITNESS: Based on the data that I have seen
 13 up to the time right after surcharge removal — and there
 14 we're talking August 1979 — I would have a concern that we
 15 are not in secondary consolidation.

16 MR. ZAMARIN: All right.

17 BY MR. ZAMARIN:

18 Q And what data leads you to believe that?

19 A We are repeating the same topics.

20 Q No.

21 A Not this morning, but in past depositions.

22 Q If you listen to what that question was you'll

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MRBwb 1 understand — what the previous question was, you'll
2 understand that.

3 I'm not asking you what information you don't
4 have; I'm asking you, based on all the information that you
5 do have, and if you were to weigh that information, whether
6 you believe it is more likely than not. So when you say you
7 believe it is more likely that it is in secondary
8 consolidation, then you had to have some data on the one
9 hand that you felt outweighed the other data, as opposed to
10 a lack of data.

11 A You're correct. And I think you're
12 misinterpreting my last statement to mean the lack of data.
13 I'm saying we had these same discussions in previous
14 depositions of why I didn't think we were in secondary
15 consolidation.

16 Now if I can help you recall: I talked about the
17 behavior of the piezometric levels following surcharge
18 removal.

19 Q All right. And that's it?

20 A The consideration whether the fill was dry and
21 cracked, and therefore can I expect the behavior that was
22 recorded and presented to us to be typical behavior for

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1 a soil under settlement. Those are the two main pieces of
2 information.

3 Q You say the two main pieces. Those are the two?

4 A That I can recall right now.

5 Q Assuming that the settlement history of the marker
6 that you do have, DG-3, is substantially similar to the
7 settlement history of these other markers which you say is
8 information we have that you don't, what then would be your
9 opinion as to whether it's more likely than not that that
10 soil was in secondary consolidation?

11 A The key words are "substantially similar." And I
12 would say if they are, in my estimation, what I consider to
13 be substantially similar relative to DG-3, and the load that
14 will be imposed under final load has been applied this
15 entire time, and we cannot expect any additional changed
16 condition such as saturating zones that were not saturated
17 and causing increased settlement, then I would say if those
18 conditions were met, then I would say we were in secondary
19 consolidation.

20 Q Okay.

21 What if the load were the same but for the
22 application of the live load?

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1 A You would have to give me the magnitude of the
2 live load to be able to say whether that's going to be
3 significant.

4 Q Assume the live load at 250 pounds per square
5 foot.

6 A I'm puzzled that it's only 250, based on previous
7 information that you had given us where I felt it was a
8 thousand pounds per square foot.

9 Assuming it's 250, I don't think that is of a
10 magnitude where there would be concern.

11 Q By the way, the information that you refer to
12 about settlement data, Darl Hood has that. He's had it for
13 a couple of weeks.

14 A What information?

15 Q That you keep saying we have that you don't have.

16 A I think you should be careful whether you think
17 Darl Hood has it or whether you submitted it to the NRC and
18 it has gotten to Darl Hood. I don't think Darl Hood has had
19 it for weeks.

20 Q He gave me a document last night that showed he
21 had it at least from the 21st of November.

22 A NRC may have had it since that time, but that

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MRBwc 1 doesn't mean that Darl Hood has had it.

2 Q He gave me a list that he wrote down. All I'm
3 saying is, He's got it.

4 A Well, in defense of myself—

5 Q I'm not saying you should know that; I'm just
6 telling you where you can find it.

7 A May I say something?

8 I'm also indicating why, at this time, if NRC has
9 had it two weeks, why I haven't had an opportunity to look
10 at it.

11 Q You've been out of town, and you've been tied up;
12 I know. I'm just telling you where to find it.

13 A Fine.

14 Q In your opinion, is secondary consolidation of the
15 soil under the diesel generator building an acceptance
16 criteria?

17 A Why not let us wait until we respond to your
18 interrogatories, in defining acceptance criteria, to answer
19 that.

20 Q Because I'd like an answer now.

21 A Would you repeat the question, please?

22 MR. ZAMARIN: would you read it back, please?

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1 (whereupon the Reporter read the pending
2 question.)

3 THE WITNESS: The impact of the secondary
4 consolidation — and by "impact" I'm talking about whatever
5 magnitude it is and whatever, because of that magnitude, the
6 stresses are that it imposes on the structures — that
7 impact, in my estimation, would be considered part of
8 acceptance criteria.

9 MR. ZAMARIN: Would you read that back, please?

10 (whereupon the Reporter read the record as
11 requested.)

12 BY MR. ZAMARIN:

13 Q I simply don't understand the answer, and I don't
14 know whether you told me that being in secondary
15 consolidation is an acceptance criteria.

16 A Acceptance criteria ~~is~~— Criteria is something
17 which you're requiring, and acceptance criteria is having
18 recognized that it is meeting that standard. And with
19 regards to secondary consolidation, what we are concerned
20 with is a safe structure. And if the secondary consolidation
21 results in stresses that overstress the structure, then it
22 would not be acceptable.

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1 Q And by the same token, then, would you agree that
2 if we're still in primary consolidation but it did not
3 result in stresses that overstrressed the structure, that
4 that would be acceptable to you?

5 A It's possible, because of the way the structure is
6 built and the way the conduit connections are made, that we
7 could be in primary consolidation, and find that to be
8 acceptable.

9 Q Have you ever heard of Willis Walker of the Tulsa
10 District?

11 A I have heard of Willis Walker.

12 Q Are you aware of the work that he has done on the
13 Midland project?

14 A It's my understanding Willis Walker was employed
15 by the Detroit District early in the review stage when they
16 were looking for assistance to get the Midland review
17 started. And that is the awareness of my knowledge.

18 Q The extent of your awareness?

19 A Yes.

20 Q Are you aware of anything he did with regard to
21 the calculations pertaining to the surcharge program, the
22 load, or the duration of the load, or anything like that?

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1 A I think I have given you in my deposition
2 documents work performed by Willis Walker for the Detroit
3 District, and they do contain calculations on settlement.

4 Q Did you review those?

5 A I did not review those.

6 Q Do you know if anybody reviewed them?

7 A It's my understanding they were reviewed by the
8 Detroit District.

9 Q To your knowledge, has anyone disagreed with, or
10 criticized Willis Walker's calculations?

11 A In one conversation I had with Hari Singh it was
12 indicated that he felt some of the assumptions used by
13 Willis Walker were of such a general nature that he did not
14 have confidence in the results.

15 Q Do you know what those assumptions were?

16 A I did not have a detailed discussion.

17 Q Has Willis Walker's work, then, been rejected?

18 A It's my understanding Willis Walker's work has
19 been incorporated into the Corps' efforts.

20 Q To your knowledge, has the NRC made a final
21 decision as to whether any portion of the operating cooling
22 pond dike is a Category I structure?

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1 A To my knowledge, a final decision has not been
2 made. I do not know.

3 Q You say "a final decision." Has a tentative
4 decision been made?

5 A I was responding to your "final decision.":

6 Q Has a tentative decision been made?

7 A I do not know of any decision other than the
8 reflection by the requested borings.

9 Q In other words, if they asked for the borings,
10 then that would at least imply that it was considered to be
11 a safety related structure; is that what you mean by that,
12 by — quote — reflection of the borings?

13 A I would say by requesting the borings it is felt
14 there is — that at least one portion has already been
15 established as being of importance enough to say that it
16 meets Category 1 requirements."

17 Q Has the Corps completed a draft SER?

18 A To my knowledge, no.

19 Q Are they working on one?

20 A They are helping to prepare testimony for the show
21 cause order, which, by its nature, will serve as part of the
22 SER input as well.

WRBwd

1 Q What individuals in the Corps are helping prepare
2 testimony for the show cause order?

3 A I'm not sure of everyone. I know I have
4 specifically spoken to Hari Singh about that.

5 Q And is there anyone else?

6 A There may be others assisting in that. Mr. Singh
7 would know that.

8 Q Are there any other projects that the Corps is
9 working on with regard to Midland besides the soils
10 settlement?

11 A I think you have a copy of our contract with the
12 Corps.

13 Q We only have a part of it.

14 A Well, I know we've had previous discussions in my
15 deposition which— It does not just address the plant fill
16 settlement problem, but it has asked them to do the review
17 through the OL stage.

18 MR. ZAMARIN: Off the record.

19 (Whereupon there was a short
20 discussion held off the record,
21 after which the deposition was
22 again continued.)

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MRBwb () 1 MR. ZAMARIN: Back on the record.

2 BY MR. ZAMARIN:

3 Q Can you tell me how compression index could be
4 used to predict settlement with regard to the diesel
5 generator building?

6 MR. PATON: Mr. Kane, I instruct you to not answer
7 any more questions.

8 MR. ZAMARIN: You'd better say why, because I'm
9 not finished with his deposition.

10 MR. PATON: For the reasons indicated at the
11 beginning of the deposition.

12 MR. ZAMARIN: Because you're simply terminating
13 the deposition although we're not finished; is that correct?

14 MR. PATON: I stated my reasons, Mr. Zamarin.

15 MR. ZAMARIN: Is that why? ...I mean, there's
16 nothing objectionable about the question?

17 MR. PATON: I stated my reasons at the beginning.
18 I said at the end of an hour we would terminate the
19 deposition.

20 MR. ZAMARIN: Okay.

21 BY MR. ZAMARIN:

22 Q I still have more questions. Do you refuse to

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MRBwb

1 answer any more questions, Mr. Kane?

2 MR. PATON: I instruct Mr. Kane not to answer any
3 more questions of any kind.

4 MR. ZAMARIN: You even instruct him not to tell
5 me whether he refuses to answer any more questions?

6 MR. PATON: I'm instructing Mr. Kane not to
7 answer. And I don't think any further interrogation of
8 Mr. Kane is necessary.

9 BY MR. ZAMARIN:

10 Q Do you refuse to answer any more questions?

11 MR. PATON: Mr. Kane, I instruct you not to
12 answer any questions of counsel for the applicant, of any
13 kind.

14 BY MR. ZAMARIN:

15 Q Do you refuse to answer any questions?

16 MR. PATON: That's the third time. I think that
17 that's enough.

18 MR. ZAMARIN: I request that the witness remain
19 and continue to answer questions. I'm not finished with his
20 deposition, and there's more information that we're entitled
21 to get from him, and I want it now.

22 MR. PATON: Okay, that's it.

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MR. ZAMARIN: Apparently we haven't gotten

2

whatever it is he's trying to hide.

3

MR. PATON: No response is necessary.

4

MR. ZAMARIN: The record should note the

5

deposition is not completed.

6

(Whereupon, at 9:45 a.m., the deposition was

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recessed sine die.)

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CERTIFICATE OF NOTARY PUBLIC AND REPORTER

I, William R. Bloom, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition had been previously duly sworn; that the testimony of said witness was taken by me by Stenomask and thereafter reduced to typewriting by me; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.



Notary Public in and for
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My commission expires 14 August 1985

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