



SMUD

SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

July 19, 1979

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert W. Reid, Chief
Operating Reactors, Branch 4
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Reid:

Docket No. 50-312
Rancho Seco Nuclear
Generating Station

During a telephone conversation on July 9, 1979, Mr. Ron Clary of the NRC staff requested a transcript of Item 2 on the agenda of the District's Board of Director's meeting held on February 1, 1979. The agenda item was "Staff report on alleged design deficiencies of Rancho Seco cooling towers." In compliance with this request, the tape recordings of the meeting have been transcribed and enclosed for your use.

Please forward this information to the proper individuals.

Sincerely,

John J. Mattimoe
Assistant General Manager
and Chief Engineer

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ITEM 2

Item 2 is a staff report on the alleged design deficiencies of the Rancho Seco cooling towers.

Mattimoe: I'm sorry that I wasn't at the last Board meeting where this subject was brought up where I think I could have answered all the questions that the Board had. Since the last Board meeting, the Board has been furnished a complete copy of the report regarding the allegations of the design deficiency at Rancho Seco. What I'd like to do is just cover a few important points that I think should be brought out and then we'll answer any questions that the Board has. First of all, I would like to point out that the results of the investigation, as stated in your document there, is neither of the allegations could be substantiated nor was there any evidence of any design deficiencies in the structures which were the subjects of the allegations. Briefly, there was an allegation by an NRC employee who had formerly been employed by Bechtel Corporation that we had made ... not only had made a design error but had covered up a design error in the design of the spent fuel pond and also with regard to the cooling towers. I'd like to take these one at a time. First of all, the allegations with the regard to the spent fuel pit. I believe the document will show that the man who made the allegations was not even involved in the design of the spent fuel pit. The spent fuel pit was designed prior to the time that this man was assigned to this job with Bechtel Corporation. He had previously been employed in a different position. In addition to the investigation that was carried on by the Nuclear Regulatory Commission, we did some additional work in which we had an independent analysis made of the spent fuel pool design and found that it was utterly safe.

The second allegation had to do with the cooling towers. To begin with the Nuclear Regulatory Commission, of course, has no real concern with regard to the cooling towers because they are not safety related. However, because the allegation was made that we did not take a look at the design of the cooling towers after the San Fernando earthquake they did make some investigation with regard to this. I'd like to point out several things with regard to the cooling towers. First of all, they are not a Class I structure which means they're not designed to the NRC criteria. The cooling towers were originally designed in accordance with criteria specified by SMUD. The seismic criteria for the cooling design was .1 G. This was the problem that the allegers said that should have been corrected. When you design any structure there are many things that you have to take into consideration for the loading on that structure. The controlling design of the cooling towers was not the seismic loading. The controlling design of the cooling towers was the wind loading. The design of the cooling towers was designed in accordance with the uniform building code requirements that called for design of ninety miles an hour ... ninety miles per hour wind loading on the cooling towers. When we designed the towers for ninety mile an hour wind loading we found that they would actually sustain an earthquake with a G force of .13, whereas the requirements were only .1. In addition to finding that there was absolutely no truth to the allegations, SMUD, particularly under my direction did some additional investigation, both at the time of this allegation and prior to the time of that allegation.

The allegations with regard to the cooling towers was basically that we had not considered what effect the San Fernando earthquake would have on the design of the cooling towers. The information that we obtained from both the Bechtel engineers, the design engineers that had looked at the results of the San Fernando earthquake indicated that it had no effect on the design at Rancho Seco. No effect on any part of the design of Rancho Seco. In addition, I personally asked our consultant, Dr. Byerly from the University of California, who is our seismic consultant to also review on the basis of the fact that the San Fernando earthquake had occurred if he would change any of his recommendations with regard to the seismic design of Rancho Seco. In the packet you will find a letter from Perry Byerly that answers my request. The letter is dated May 3, 1971 which is some four months after the San Fernando earthquake. Dr. Byerly was contra ... we contracted with Dr. Byerly ... SMUD contracted with Dr. Byerly since the beginning of Rancho Seco for our seismic consultant. Dr. Byerly comes with rather extensive credentials and just to briefly reiterate I will tell you what his credentials are: he is a director of _____ of the University of California Seismographic Stations, he is a past president and honorary member of the Seismological Society of America, the past president of the International Association of Seismology, the past chairman of the section of Geo-Physics of the National Academy of Sciences, a fellow of the American Academy of Arts and Sciences, a fellow of the Washington Academy of Science and a founding member of the Earthquake Engineering Research Institute. I will quote from Dr. Byerly's letter with a little background. Dr. Byerly did not agree with the seismic criteria that was being imposed upon us at Rancho Seco. His analysis indicated that .05 was absolutely safe for the design of Rancho Seco. He reiterated that after the San Fernando earthquake. With regard to the Class I structures of the nuclear facilities at Rancho Seco I will again quote from his letter. "I feel that .1 G for the operating accident and .2 G for the design accident are utterly safe." Which he means ... what he means by that is that we were being ultraconservative.

Those are the only remarks I have to make but I would be glad to answer any questions with regard to this. I might note that all the investigation with regard to the San Fernando earthquake was made after the San Fernando earthquake and not as a result of the allegations from the NRC engineer who said we had made an error.

Any questions from the Board?

Director Castro: I have a question. You said that the analysis on Rancho Seco was ... on the cooling towers rather was made after the San Fernando earthquake.

Mr. John Mattimoe: No, I did not say that.

C: Could you ex ... I I guess I missed that. What kind of analysis was done to the cooling towers after the San Fernando earthquake? Was there any?

M: I can't hear your ...

C: Oh, isn't this on?

Speak into it (third voice)

C: Excuse me. Um, I I guess my question was what kind of analysis was done on the cooling towers after the San Fernando earthquake?

M: None, it was recommended by Professor Byerly and also by two independent engineers that no additional analysis be made. The San Fernando earthquake to put it in a short sentence had no effect on the seismic criteria for Sacramento.

C: So the ...

M: There was no reason to re-analyze.

C: And that's what these sworn statements attest to the fact that there was none done. Is that right?

M: They also attest to the fact that there was none required because there was no change in the seismic criteria that should have been employed at Rancho Seco because of the results of the San Fernando earthquake.

C: And that was based on their best judgment I guess because they looked ... did they at least look at the standard ... did Bechtel look at the standards for design of the cooling towers and then decide not to do an investigation, I I ... who made the decision not to look at it I I'm a little unclear on that, um John.

M: SMUD made the decision. I made the decision based on the information obtained from Dr. Byerly and the information obtained from Bechtel.

C: So what happened was Dr. Byerly is familiar with the San Fernando earthquake ...

M: Absolutely ...

C: ... and also having been familiar with the cooling tower design made a recommendation that we didn't need to investigate it. That was you two ...

M: The fact was his recommendation was that we were over designed in the first place.

C: You said that ... didn't you say ... you said that the spent fuel pit that you did an independent analysis and found that it was utterly safe. Was that done after San Fernando earthquake?

M: No, it was done after the allegations.

C: And ...

M: But, let me add something. After the San Fernando earthquake we investigated as to whether that would have any effect on any of the seismic criteria used at Rancho Seco and the answer at that time was no.

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C: You said ...

M: There was no reason to re-analyze anything at Rancho Seco.

C: And who did the independent analysis of the spent fuel pit at the time?
Can you tell us who that was?

M: It's in the document, I have to look it up right now ...

C: mk

M: It's, ... boy I wish you'd asked me an easier question. It's spelled
A-S-A-D-O-U-R, which I assume is Asadour H-Hadjain H-A-D-J-I-A-N.

C: And where is he ... I asked you because I couldn't pronounce his name ...

M: That's what I thought.

C: ... Where is he from?

M: Pardon?

C: Who is he with?

M: He works for Bechtel, but he was not employed on the Rancho Seco original
analysis.

C: He was not employed on the Rancho Seco original analysis but when he did
the analysis he was employed by Bechtel?

M: That is correct.

C: Which was done ... which did the ... which was involved in the original
design of Rancho Seco?

M: Yes, but he made an independent analysis.

C: How did he do that as an employee of Bechtel? I guess that's what I'm
looking at.

M: How did he do it as an indep ...

C: I mean, you didn't hire Bechtel, you hired him as a consulting firm or
something?

M: I didn't hire him at all. Bechtel did this additional analysis by an
independent ... independent from anyone who was involved with the original
analysis.

C: Oh, I see, I didn't understand what independent analysis meant. So Bechtel
went along and they had , , , personnel who were not involved in the original
analysis that did the analysis, , , and that's the independent analysis?

- M: That's correct.
- C: Ok, and was that done after the NRC investigation?
- M: Yes.
- C: And did the NRC investigation look at the spent fuel pit design?
- M: Yes, and they also looked at the independent analysis as referred to in the report.
- C: Was the independent analysis done after the NRC analysis?
- M: Was the independent analysis done ... No, it was done prior to the NRC analysis.
- C: But NRC also did a separate analysis? There were two analyses ...
- M: On the spent fuel pit. NRC did the original analysis of the spent fuel pit when we applied for our license.
- C: I guess what I'm trying to get a feel for, John, is if NRC did an analysis why did Bechtel also do an analysis? Is it because Bechtel didn't trust the NRC analysis or NRC didn't trust the Bechtel analysis?
- M: No, but we wanted to make sure that there was absolutely no validity to the allegations.
- C: And when there are allegations made are you ... do you always do redundant investigations? When it's concerned with the safety at Rancho Seco? Because you told me in this case that it was important to do. Is that standard procedure?
- M: It would be standard procedure, it would be certainly my standard procedure to my knowledge this is the first allegation that was ever made that there was a design error at Rancho Seco.
- C: Ok, on the cooling tower design is a Class I, a, I saw in here there was a .28 G is that what the Class I standard is? And that's what the nuclear plant itself meets.
- M: No, the Class I standard for Rancho Seco is .25 G. You'll find in there that when we made the analysis it actually would take .28 which is an additional factor of safety above the .25 which was a regulatory requirement which I might add was 2-1/2 times what Professor Byerly recommended.
- C: Ok, ... was Professor Byerly involved in the design or the independent analysis or any way of the spent fuel pit? Those are two questions.
- M: No, Professor Byerly's complete assignment was to determine what seismic criteria we should use for the design of Rancho Seco.
- C: Cooling towers?
- M: Everything at Rancho Seco. He established the seismic criteria for that site.

C: But NRC ...

M: But NRC doubled it.

C: Ok, and NRC so he made certain standards for all of Rancho Seco, NRC doubled it on the compliments that they have regulatory control over it as the spent fuel pit and reactor itself but they don't have, ... is it true that they don't have control over the cooling towers?

M: Well, you've asked about three questions. Can we go back one at a time?

C: I'm just trying to get a feel for the separation between the cooling towers which supposedly aren't under NRC design ... seismic standards.

M: That's correct. The cooling towers are not subject to NRC regulation. They are not a part of the nuclear plant from a standpoint of safety to the public.

C: And I'm trying to get a feel if Dr. Byerly was a seismic specialist and consultant to SMUD and he developed design standards for Rancho Seco and ...

M: He developed ...

C: Excuse me ...

M: ... the seismic criteria, not the design standards.

C: Ok, he developed the seismic criteria for Rancho Seco.

M: That's correct.

C: And all the compliments including the cooling towers, excuse me, I'd just like to continue here. And in that design his standards were doubled in those areas that NRC had overview but in the one area on the cooling towers where there was no NRC overview the standards were kept the same as Dr. Byerly recommended.

M: No. They were doubled. Dr. Byerly represented ... recommended .05 we designed the cooling tower to .1 which was doubled.

C: But not because of seismic standards but because so it wouldn't blow over. Because you said that after you did the wind design for ninety miles per hour that in fact ...

M: No, no, you're confusing. I said that when you design a structure there are many things you have to consider. You have to consider dead load, wind load, ice and snow load if its in an area, you have to consider seismic loading. All of these loads create a certain stress with the structure. Some of them much less than others. The controlling criteria for the cooling towers was not the seismic design. We ran the calculations for a seismic design on the cooling towers double of what Professor Byerly recommended. Then we ran the design on the cooling towers ... design calculations on the cooling towers for the wind loading. We found that the wind loading was the controlling factor. That's what controlled the design of the cooling towers. If you took the design that you came the

results of the design because of the wind loading and you back that up found out which ... what seismic criteria it would withstand, the seismic criteria then became .13, which is 2.2 times what Professor Byerly had recommended.

C: I'd like to let someone else talk now.

Mr. Wm. Walbridge: Rick, I think these points that John's been making have been quite clearly in the report that you received and the findings of the NRC on page 5 quite clearly state that the seismic design criteria of such structures is based on a .10 G horizontal ground acceleration. The following paragraph points out that the earthquake which produced a .13 horizontal ground acceleration as far as wind design is spelled out quite clearly in the report.

C: Right, I read the report and I saw that, I just wanted to be able to clarify that what I read was correct.

Director Carr: John, I'd like to ask you a question if I could please. Since there was obviously no merit to their claim, allegation, do you know the conditions under which the employee terminated from Bechtel?

M: I can't remember exactly Paul so I'd rather not say. He was not fired. As I remember, he left of his own free will to take another position. But the allegations came some four or five years after he left Bechtel so it would have no effect upon Bechtel's action toward that employee because the allegations came in 1978. I believe he left Bechtel in 1973 some four or five years prior to that.

Carr: Ya but, a disgruntled employee could be looking back ...

M: I guess I would prefer not to go into details there. I do know some more information but I don't know that I'm not invading upon the privacy of an individual. Although the Nuclear Regulatory Commission would not disclose his name to us or to Bechtel, it was quite apparent who he was, everyone knew who the individual was. And I have no personal feelings against the individual and I'd rather not answer that question.

? John, just to recap this thing a little bit, this document gets a little bit confusing... but it seems to me like he had a dispute with his immediate superior with regard to the criteria on one small section of that cooling tower, a decimal point error of the magnitude of ten times I gather ...

M: That's correct.

? The supervisor didn't feel that it was it is his concern was justified and overruled him is that about the way it worked?

M: Not really, the calculations that were made as a result of us expanding the spent fuel pit were made on a very conservative basis. There were some additional calculations made in order to assure that our conservative basis was in fact conservative. These are what we refer to as supplemental calculations. This man did make some of those supplemental calculations and there was a decimal point error in it. His supervisor

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told him that it didn't make any difference. That if he'd corrected the decimal point error it would still give a value that was less than the design used. This supplemental calculation was just to prove that our conservatism was as we thought it was. We took that point where we found, we actually did find where there was a decimal point error. We corrected the decimal point error, ran the calculations again and it still had no effect on the final design of the spent fuel pit because the original design had been made with more conservative figures. Its similar to the fact that we looked at the design from a seismic standpoint and from a wind loading standpoint and the one had a greater effect than the other. Our original design had a greater effect than the supplemental calculation that he had made.

? Well, I'm really confused now because it was my understanding that he had not worked on the spent fuel calculations that he's worked on the calculations with regard to the cooling towers.

M: No, he had nothing to do with the cooling towers. In fact, I apologize if I confuse you, in fact, he had nothing to do with the spent fuel pit. The calculations where there was a decimal point error had to do with the plant vent, but the plant vent which is the stack that goes up alongside the reactor building does tie structurally to the wall of the spent fuel pit. And this design calculation could be construed as a part of the spent fuel pit but it really wasn't. So this man was never involved in the calculations for the spent fuel pit. He was involved in the calculations for the plant vent.

Castro: Umm, I see. And the wind factor is what determined that even though there was an error in the seismic loading that because they'd designed it for wind loading that there was no problem.

M: That only refers to the cooling towers not to the spent fuel pit. Spent fuel pits ... the controlling criteria is seismic.

C: And is the controlling criteria for the plant vent structure wind loading? Is that right?

M: No, the controlling criteria for the plant vent was seismic.

C: Well, what does it mean here then it says "since wind loading was more than a factor of ten greater than seismic loading"? The question of whether to use 0.036 G or .36 G was ? Doesn't that indicate that ...

M: Will you tell me where you're reading?

C: Its in the document on page 7. It's this one John. Isn't this memo different from some other ones.

M: You're right, I stand corrected. The plant vent also the controlling factor was the wind loading.

? Did you say, John, that the spent fuel pit vent would not be a concern to the Nuclear Regulatory Commission?

- M: No, the spent fuel pit is absolutely in the plant vent is absolutely a concern of the Nuclear Regulatory Commission. Only the cooling towers is not of concern to the ...
- ? Ya well, then apparently after their investigation they didn't feel that there was much of a case here I gather from reading all this material.
- M: There was no case whatsoever.
- C: Is it that there was in terms of this investigation with SMUD there was no allegation to the charge that there was any inappropriate actions taken by SMUD. Is that correct?
- M: There were no inappropriate actions taken by SMUD? Is that what you said?
- C: SMUD was clear or whatever.
- M: Yes, there was no action to take by SMUD. The allegations were proven false.
- C: I guess I'm wondering where they've proven false in terms of their allegations against Bechtel and also against SMUD or are we just looking at the allegations against SMUD?
- W: Rick, I think the report is quite clear in that if you take a look at the facing page of the NRC report, it talks about the special investigation and the result, I don't think anything could be much more succinct. Results say neither of the allegations could be substantiated nor was there any evidence of design deficiencies in the structures which were the subject of the allegations. That's about as plain english as the NRC ever uses.
- ?? I'd like to add ... I'd like to follow up a question on that, um I don't know whether it should be to you Bill or to you John but uh this report from the NRC, as I gathered from reading through the material has been on file now for, as a public document, for some six months or so.
- M: That's correct. Its been in the public document room since June of 1978.
- ? The full document, including what Bill just read?
- M: Yes. Everything. Yes, the complete document and its the only thing that I'm referring to, the only thing that I've added to this document that isn't in the public document room is the qualifications of Dr. Byerly.
- ? Ok, the thing that confuses me then about this is that this whole issue had been brought up just recently and if reading a recent news article it indicates that this information has been known and suppressed for apparently fomr some period of time. I don't understand why the full content of the report wasn't brought out at the time of the last meeting.
- ?? At this point, obviously I'm confused as to the purpose ...

M: I guess the full content of the ... I can answer the first part of your questions, the full content of the report wasn't brought out at the last meeting because I wasn't here and I guess I'm the most familiar person with it. After all, you'll find that it is addressed to me.

? I'm really talking about the individual who decided to bring it up at that time who obviously had been very much impressed and involved with this particular study.

?? ... get to be conjecture. I've got another question here at the end John, we keep talking about the ... I want to keep this a little longer ... we keep talking about the fact that the design criteria was adequate and in fact it was over designed for what was required and yet at the end of the end of this Nuclear Regulatory last document that's in this group. It says, at the conclusion of the visit to Bechtel Norwalk the inspector stated the finding regarding the revised calculations not being checked indicated a soft spot in QA practices at that time. Bechtel stated that practices in this regard had been tightened during the past eight years. So, apparently there wasn't total satisfaction with the idea of some one being concerned about an error of some magnitude and having it pass over by his superior, at least that's what I would pick up from this.

M: What that really means, is that according to their quality assurance procedures that check should have been made and noted in the procedures and it was not. That is the only thing that we found wrong, is that that particular procedure had not been followed and that it had been written and signed off by the engineer.

? So, what we're talking about is that an improper procedure in the early workings that didn't have a ... didn't have an effect on the final product that was harmful, I gather.

M: Right, the fact that they violated that procedure did have had no effect on the final project.

C: Was there an investigation as to whether similar, other similar soft spots in quality assurance had been ... did they look for other soft spots when they did that analysis? Did they go over and check all the figures?

M: All the figures for what?

C: I'm just wondering if for one earthquake design, the earthquake standards if Bechtel ... was NRC's investigation just on this one issue?

M: NRC, as well as SMUD has the responsibility for auditing or approving the complete design calculations of Bechtel with regard to Rancho Seco and this is also audited by our own QA department and we have found no places that have been where they have violated their QA procedures where they haven't made corrections or if they were violated that it had any effect on the design.

- C: So you, since you double phrased that you did find some that are you saying that you did find some that they didn't have an effect on the design other than this one?
- M: No, I'm not saying that. We found no places where it had effect on the design.
- C: Did you find no errors, I guess that was ...
- M: Well, we found errors in Quality Assurance procedures that were corrected.
- C: Did you find this one?
- M: No, we did not find that one.
- W: Alright, are there any other questions from the Board with regard to this? Inasmuch as it was brought up at a public meeting and has had some coverage in the press I think it might be appropriate to hear and it's also about 7:30 time for statements from visitors and anyone who would like to comment on this from the audience may do so at this time. Would you give your name please. ... Certainly, yes that would be fine.